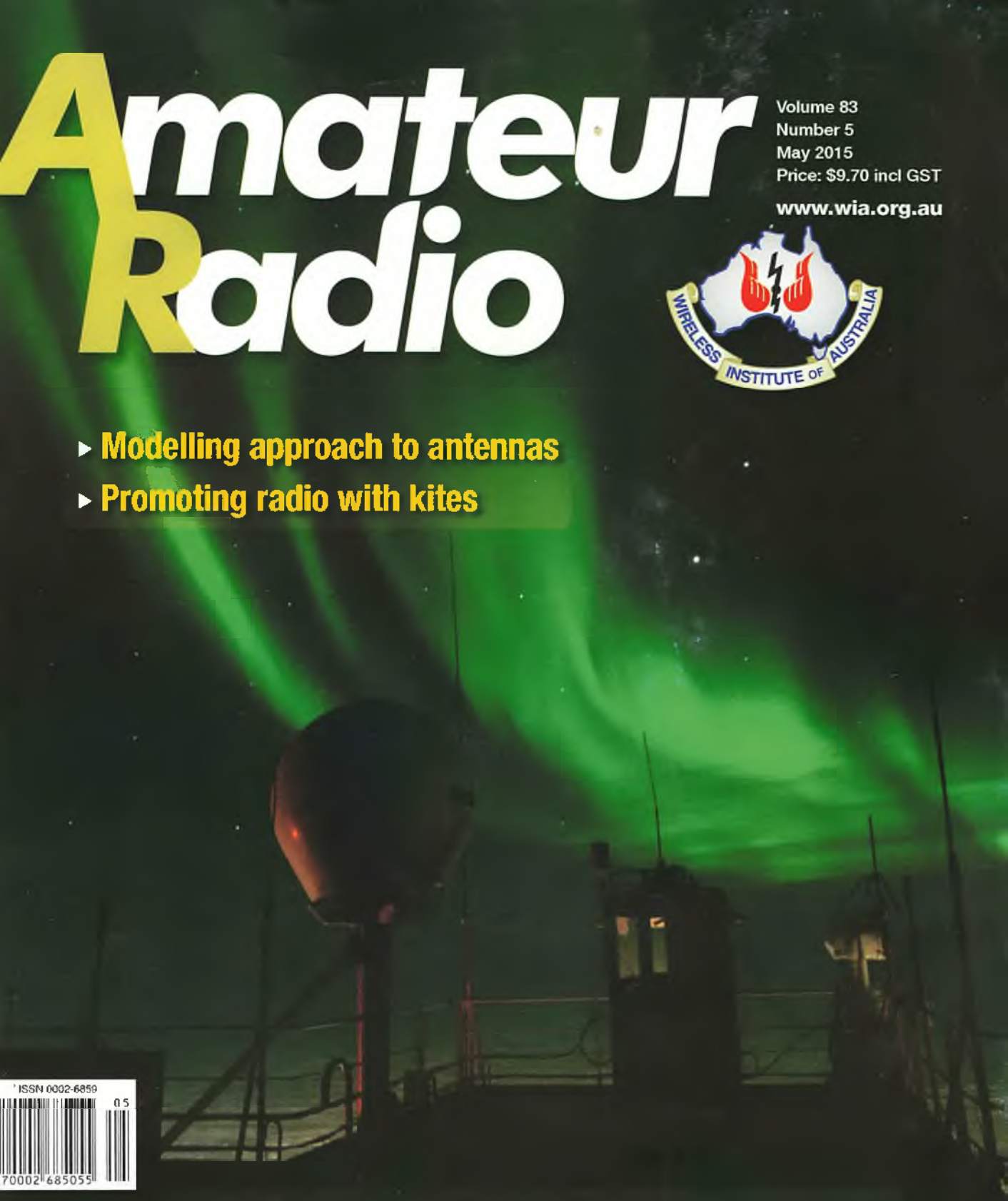
Amateur Radio

Volume 83
Number 5
May 2015
Price: $9.70 incl GST
www.wia.org.au

- Modelling approach to antennas
- Promoting radio with kites



ISSN 0002-6859
05
70002 685055

VK0: then and now

The radio... YAESU

FT-991

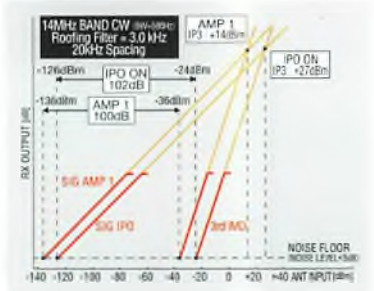
HF/VHF/UHF
ALL MODE TRANSCEIVER

New generation all-band transceiver FT-991 offers full-fledged support for all modes including HF/50/144/430 MHz in a single compact unit

- Triple conversion with 1st IF frequency of 69.450MHz for all bands
- Narrow band 3 kHz roofing filter provided in standard configuration realizes excellent adjacent multi signal characteristics
- Features the highly acclaimed FTDX series quad mixer, along with a dedicated VHF/UHF mixer
- Highly effective interference removal functions are great for stress-free QSOs on the DX and Contest scene
- Final Stage with Ample Power Reserves: 100 W for HF/50 MHz Bands and 50 W for VHF/UHF Bands
- 3.5 inch full color touch panel display for convenient comfortable operating
- Advanced Spectrum Scope Function with Waterfall Display Capability
- Advanced technologies fully utilize the potential of C4FM Digital including high-quality transmit audio, AMS, and Group Monitor functions

* Snapshot image send/receive by C4FM digital is not possible

3 kHz and 15 kHz Roofing Filter



DR (IMD Dynamic range) · IP3 (3rd-Order Intercept Point) characteristics

C4FM
Clear and Crisp Voice Technology

HF/VHF/UHF 100 W
All Mode Transceiver

FT-991

(144 MHz/ 430 MHz 50 W)

YAESU
The radio

YAESU Authorized Dealer

Andrews Communications Systems
Shop 8, 41-51 Bathurst Street, Greystanes NSW 2145
URL : www.andrewscom.com.au
Tel: +61-2-9636-9060

Strictly HAM Pty. Ltd.
Shop 12B Church Street Bayswater Vic. 3153
URL : www.strictlyham.com.au
Tel: +61-3-9729-7656

YAESU Authorized Service Center

Andrews Communications Systems
Shop 8, 41-51 Bathurst Street, Greystanes NSW 2145
Tel: +61-2-9636-9060, Fax: +61-2-9688-1995
E-mail: radioandrews@hotmail.com

JNB Electronics Pty Ltd
347 Settlement Rd, Thomastown Victoria 3074
Tel: +61-3-9465-9399, Fax: +61-3-8682-8748
E-mail: yaesu@jnb.com.au

Volume 83
Number 5
May 2015
ISSN 0002-6859

Amateur Radio

The Journal of the Wireless Institute of Australia

Editorial

Editor
Peter Freeman VK3PF
editor@wia.org.au

Technical Editor
Peter Gibson VK3AZL

Publications Committee
Peter Hartfield VK3PH
Evan Jarman VK3ANI
Ewen Templeton VK3OW
Kaye Wright VK3FKDW

All circulation matters
nationaloffice@wia.org.au

How to submit material
Secretary
AR Publications Committee
PO Box 2042
BAYSWATER VIC 3153
or *armag@wia.org.au*

Letters to Editor
Editor AR Magazine
PO Box 273
Churchill Vic 3842
or *editor@wia.org.au*

Hamads
'Hamads'
PO Box 2042
BAYSWATER VIC 3153
hamads@wia.org.au

Advertising
All enquiries to
Advertising Manager
AR Publications Committee
PO Box 2042
BAYSWATER VIC 3153
or *admanager@wia.org.au*

Registered Office
Unit 20 11-13 Havelock Road
BAYSWATER VIC 3153
Australia
Phone: 03 9729 0400
Fax: 03 9729 7325

Production Deadlines
All articles, columns, hamads and advertising booking by **first day of previous month.**

Technical

The stealth antenna grows wings 12
Ron Holmes VK5VH

A modelling approach to antenna construction (Part 3) 15
Stephen Ireland VK3VM/VK3SIR

Add amplifier and antenna switching to your Yaesu FT-857/897 58
Albert Gnaccarini VK3TU

This month's cover

Our cover this month shows the Aurora Australis (also known as the Southern Lights) viewed from the upper deck of the Australia Antarctic Division's icebreaker of the same name. See the article beginning on page 32 and the inside back cover. Photo by Craig Hayhow VK6JJJ.

General

The first DXpedition to Macquarie Island 6
Rob Gurr VK5RG

ARDF 2015 9
Jack Bramham VK3WWW

Rosebud Kite Festival 22
John Fisher VK3DQ

Frank Miller VK5BF: Pioneer radio experimenter in Murray Bridge 23
Lloyd Butler VK5BR

VK0JJJ/mobile marine aboard the ice breaker Aurora Australis 32
Craig Hayhow VK6JJJ

Columns

ALARA	45
Contests	41, 42
Editorial	2
Hamads	62
Over to You	29, 37
Silent Key	26, 47, 61
SOTA News	30
Spotlight On SWLing	37
VHF/UHF – An Expanding World	26
WIA Comment	3
WIA News	4, 5
VK1 News	57
VK2 News	36
VK3 News	29, 38, 50
VK6 News	52
VK7 News	48

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 welcome and will be considered for publication. Articles attached to email are especially welcome. The WIA cannot be responsible for loss or damage to any material. Information on house style is available from the Editor.

Back issues
Back issues are available directly from the WIA National Office (until stocks are exhausted), at $8.00 each (including postage within Australia) to members.

Photostat copies
If back issues are unavailable, 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
ABN 56 004 920 745

The world's oldest
National Radio Society, founded 1910.

Representing
The Australian Amateur Radio Service
Member of the International Amateur Radio Union

Registered Office of the WIA
Andersson House
Unit 20, 11 Havelock Road
Bayswater, Victoria, 3153
Tel: (03) 9729 0400 Fax (03) 9729 7325
email: *nationaloffice@wia.org.au*
http://www.wia.org.au

All mail to
PO Box 2042 BAYSWATER VIC 3153
Business hours: 10am – 4pm weekdays

National Office staff

Manager	Mal Brooks	VK3FDSL
Examination Officer	Dianne Ashton	VK3FDIZ

Board of Directors

President	Phil Wait	VK2ASD
Vice-President	Chris Platt	VK5CP
Directors	Robert Broomhead	VK3DN
	Rowan Dollar	VK2ELF
	Roger Harrison	VK2ZRH
	Ewan McLeod	VK4ERM
	Fred Swainston	VK3DAC
Secretary	David Williams	VK3RU
Treasurer	John Longayroux	VK3PZ

Coordinators

AMSAT	Paul Paradigm	VK2TXT
ARDF	Jack Bramham	VK3WWW
Australian ARISS	Tony Hutchison	VK5ZAI
Awards	Chris Platt	VK5CP
Clubs	Ted Thrift	VK2ARA
Contests	Craig Edwards	VK8POX
John Moyle Field Day	Denis Johnstone	VK4AE
Editor 'AR'	Peter Freeman	VK3PF
EMC/EMR	Gilbert Hughes	VK1GH
Standards	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	John Bishop	VK2ZDI
NTAC	John Martin	VK3KM
Historian	Peter Wollenden	VK3RV
IARU Region 3 Liaison	Chris Platt	VK5CP
Monitoring Service	Peter Young	VK3MV
ITU Conference & Study Group		
	David Wardlaw	VK3ADW
	Brett Dawson	VK2CBD
	Dale Hughes	VK1DSH
QSL Curator	National Office	
Repeater	Peter Mill	VK3ZPP
Webpage	Robert Broomhead	VK3DN
Emergency Communications Group		
Coordinator	Phil Wait	VK2ASD
Members	Ewan McLeod	VK4ERM
	Peter Young	VK3MV

Editorial

Peter Freeman VK3PF

Conference time once again

The 2015 edition of the WIA Annual General Meeting and Conference is almost upon us. The last 12 months have gone quickly! The destination for those attending is Canberra, with most planned activities on Saturday.

The Annual General Meeting (AGM) itself is usually a brief formal meeting, but the Open Forum which follows allows for interaction with the Board members and various volunteers. This is your chance to ask that burning question or to share your brick bat or bouquet.

Of course, there is a social gathering on Friday evening, plus many activities in and around Canberra from which to choose to fill in Sunday.

For me, most of Sunday will be spent in the car, driving back home: the weekend is the proof reading weekend for the June issue of *Amateur Radio*, plus I have classes to deliver on Monday morning. So it will be a quick and busy trip for me, especially when you add in the scheduled meeting of the Technical Advisory Committee on Friday afternoon.

I note that the VK1 SOTA group are planning various activities over the weekend, so there will probably be a chance for those not yet initiated to SOTA to visit a summit, observe what it is all about and probably make some contacts yourself. Hopefully I can squeeze in at least a couple of summits during the trip – in fact this should be very easy, with several summits located within Canberra itself.

Details for the events have been on the WIA website for several weeks now. I am not aware of the closing dates for bookings for the various events. Even if you do not register, you would still be able to attend the AGM and Open Forum, but not partake of the associated meals. Check the website sooner rather than later!

Hopefully I will be able to catch up with some of you over the weekend.

Antennas and supports

I have been operating at home with some rather suboptimal antennas.

I have a 2 m vertical in the roof cavity – completely invisible! There is a 2 m/70 cm dual band vertical erected later, mounted on a "hockey stick" mount bolted to the eaves. For HF, I initially started with a wire held up by a squid pole, tuned with an auto-tuner against a couple of counterpoise wires. Unfortunately, this tends to pick up lots of noise, which at times can mask all but very strong signals.

The next step was to use a star picket in the garden bed to hold up a nine metre aluminium portable mast – very temporary – with a 40 m/80 m fan dipole with the apex at around 8.5 m. From memory, that temporary mast has been up for around two years!

Of late, the fan dipole has occasionally presented a very odd impedance to the transceiver, resulting in the rig shutting down when transmitting when in a hurry to make a contact and not first checking out everything.

Perhaps it is time to make some preparations to erect something more permanent!

Even so, it reminds me that we all should do regular checks of our station installations.

Until next month....

Cheers,

Peter VK3PF

WIA comment

Phil Wait VK2ASD

When is a Special Event special?

There is no issue closer to a radio amateur's heart than call signs, so I'm approaching this President's Comment with a good deal of trepidation. Special call signs are issued for the purpose of celebrating significant events, and in Australia the letters AX can be substituted for the VK prefix on a temporary basis, and VI can be issued with a WIA call sign recommendation and ACMA approval.

The AX prefix is permitted to be used by all Australian radio amateurs for events of national significance. These are: Australia Day, Anzac Day and ITU Day, or a major sporting event like the Sydney 2000 Olympics. Use of the AX prefix was permitted over a whole year for the Captain Cook Bicentenary of 1970, a major occasion of national and international significance. In other words, the AX prefix is very tightly controlled and its usage is clearly defined.

The VI prefix on the other hand is permitted to be used by clubs, organizations, or groups of amateurs for occasions of special State or local significance, but only when the prefix is not required for use by other radiocommunications services. Special event call sign recommendations are made by the WIA to the ACMA, and in most cases the ACMA will follow the WIA's recommendation and issue the call sign. Special event VI call signs would normally only be issued where the Amateur station concerned is actually participating in the event. Generally, only one VI licence would be issued per event.

However, the question often arises as to what constitutes a "special event". According to the regulation, a special event is an event of international, national, state/territory or local significance and of broad interest to the Amateur or wider community. A special event call sign would not normally be issued for a recurrent event unless it is a particularly significant occasion, or for a 25 year, 50 year, or 100 year anniversary. Notably, special call signs are available for the annual Jamboree on the Air (JOTA), the VKnGGA-GGZ block for Guides and the VKnSAA-SDZ block for Scouts. A special event call sign cannot be issued in a situation where a competitive advantage may be obtained, such as in a contest or for use during Islands on the Air (IOTA) competitions, DX expeditions, or fox hunts etc.

Recently, the WIA has received applications for special event call signs that fall outside the defined requirements of a "special event". For instance, one was for a 30-year anniversary of a radio club and another was for a DXpedition. The WIA's view is that these occasions do not meet the definition of "special", and the applications for the requested special call signs were not recommended to the ACMA.

However, in the past, the WIA has not been very consistent in its definition of "special", and VI callsigns applications have been received for DXpeditions, for example. On one occasion, a single-letter 2x1 call sign (VI2R) was recommended by the WIA, and issued by the ACMA for an amateur station associated with the Rotary International Convention held in Sydney in 2014, even though its issue did not meet the regulatory requirements.

In order to apply a more consistent approach to the recommendation of special event call signs, the "specialness" of an event will now be determined by at least one WIA Director and a member who is knowledgeable about these matters, following receipt of an application. Consequentially, the Directors will be applying criteria for each VI call sign issued. Your thoughts in what warrants a VI prefix would be appreciated.

Each administration around the world has its own requirements regarding special event call signs. For instance, in Australia, we have been permitted to use commemorative call signs for very special events, such as the use of VK100WIA for the centenary of the WIA, and the current use of the commemorative ANZAC call signs; however, the FCC and some other administrations do not allow commemorative call signs, so our current use of the VK100ANZAC call sign would not be permissible. A good summary of call sign application and usage in Australia is in the WIA **Callbook**.

PS: By the time you read this, the WIA's AGM will be only a week or so away. The Open Forum reports, submitted by each WIA committee, are placed on the WIA website a couple of weeks prior to the AGM, so please take a look at what has happened at the WIA over the past year. If you are coming to Canberra, please come up and say 'hello' to the WIA Directors, and let them know what you think (politely!).

WIA news

AX-prefixed QSL carded stations now have an ANZAC award

If you used the alternative prefix of 'AX' in your callsign on April 25th and 26th, then consider registering now on the WIA website to let others know, and possibly qualify for an operating award. To register simply go to the registration page (*http://www.wia.org.au/newsevents/anzaccentenary/axcallsignregistration/*) enter your name, AX callsign and intended location and it will be added to the online list, it's that simple.

Award rules are easy. Log a symbolic 100 points for the Gallipoli Century, each ordinary VK callsign is worth 1 point, ANZAC-suffixed callsigns including ZL100ANZAC or any WWI commemorative station which includes the TC100-prefix stations Turkey, the OP0PPY station in Belgium and at overseas war memorials and cemeteries, are worth 10 points each.

All award claims are done electronically and must include an image of the claimant's AX callsign QSL card.

The registration, rules and how to claim are all on the WIA website simply select ANZAC Centenary under the **News and Events** menu on the WIA website.

Gallipoli signallers provide battle links

As soon as the ANZACs landed at Gallipoli in Turkey on April 25th 1915, the signallers, well-trained and proficient in Morse code signalling on flag, lamp and heliograph (pictured right), as well as in map reading, immediately began laying telephone lines. The Australian and New Zealand Army Corp (ANZAC) did battle with Ottoman Empire soldiers at Gallipoli during WWI. The ANZACs went on to fight on the western front.

Around the world radio amateurs are now marking the 100 years that have passed since Gallipoli and WWI. Writing in the FIST Down Under newsletter for April, Alan Gibbs VK6PG said the signallers, identified by a right arm patch, by midnight that day were at headquarters with working telephones and message-forms. They were in contact with troop brigades. However, at times movement was so quick that the phone network lines could not keep up.

Alan VK6PG said many signallers were killed or injured when repairing lines, and forced to show themselves

as they relayed messages manually. He said where it was not possible to lay landlines, visual signalling was used, sometimes flags or sunlight by day, and Lucas Lamps at night. It was always extremely dangerous to transmit towards the front of the battlefield, as this would attract enemy rifle fire. The article reports that in many cases, both Turkish and ANZAC phone wires were in the same trench, along with many dead and wounded soldiers from both sides. Amidst the enormous chaos of warfare, the signallers did a massive job in keeping communications operational both in the field and with supporting war ships nearby.

As radio amateurs begin to commemorate the heavy losses suffered during the war 100 years ago, the Wireless Institute of Australia (WIA) has details of its activity campaign online at www.wia.org.au The website has commemorative stations throughout Australia, Belgium, New Zealand, Turkey, and elsewhere. This includes ANZAC-suffixed callsigns in VK and ZL, AX-prefixed callsigns in Australia, Belgium OP0PPYis at Polygon Wood, while Turkey has nine TC100-prefixed commemorative stations.

Gallipoli ceremonies have amateur radio access

Australian and New Zealand radio amateurs traveling to Gallipoli for the ANZAC ceremonies on April 25, ANZAC Day, will have VHF and UHF frequencies available, including EchoLink access.

The Türkiye Radyo Amatörleri Cemiyeti (TRAC) has set-up repeater TA3EC at Gokceada Island on EchoLink 433.850 MHz 88.5 Hz CTSS, with Yagi beam coverage to the commemoration areas. TRAC President Aziz Sasa TA1E says the intention is also to be listening nearby on 145.550 MHz and 433.550 MHz, as the VK and ZL visitors disembark from buses and pass through a security check point. He says TRAC has already dealt with the embassy to allow hand-held radios to be taken to the commemorations. Under the CEPT rules the guests can operate freely by identifying as TA1 slash their home call. A little hospitality and international friendship is being shown by TRAC to all radio amateurs from VK and ZL.

Among those attending is June Sim VK4SJ, a first generation daughter of a Gallipoli Veteran, who will be joined by her son Anthony VK8NCS, at the Dawn Service, and the later service at Lone Pine.

There are others attending and we wish them all well during what will be a very respectful observance and commemoration of the WWI battlefield, where the ANZAC and Ottoman Empire soldiers fought during WWI.

War Cemeteries and Memorials

Many who left the shores of Australia to serve in WWI did not return. The same happened during WWII. One of the war graves and memorials for fallen Australians is Polygon Wood in Belgium. There are many overseas sites of significance including those in France, Malta, The Philippines, Malaysia, and Papua New Guinea. At Polygon Wood a large mound known as the Butte used for training by the Belgian Army before WWI, now stands a memorial to the 5th Australian Division.

Polygon Wood was destroyed in the battle. It has been re-built with walking tracks, and to honour those who served the Great War, it has a large cemetery. It contains the graves of many soldiers, in fact 2,103 burials have been conducted with full honours, and 428 are identified. Work on the cemetery by Australians began at Polygon Wood soon after the Armistice was signed on November 11, 1918. Many Australians now visit Polygon Wood, its 'Brothers in Arms' memorial and stop at the ANZAC Rest Café, often tracing the footsteps of family members who served in the area in WWI.

To honour those at Polygon Wood, a commemorative callsign OP0PPY will be activated on April 25, ANZAC Day. Philippe Haverhelst ON8PV reports that a lot of remembrance occurs at that time, that will be joined by OP0PPY using an Icom IC-7400 feeding a Hexbeam on CW and Phone.

The memorial at Polygon Wood is similar to that commemorating the Australian 1st Division at Pozieres on the Somme. It is a tall obelisk with the rising sun emblem of the Australian Imperial Force, and underneath a large plaque which reads 'To the Officers Non-Commissioned Officers and Men of the 5th Australian Division who fought in France and Belgium 1916 - 1917 - 1918.' Beneath these words is a list of the battles, which include of course Polygon Wood. At the bottom the main inscription is repeated in French. In 1935, the memorial was visited by the Prime Minister of Australia, Joseph Lyons, when he toured the Western Front.

Bush Telegraph Centre display in May

The Tableland Radio Group with the Cardwell Bush Telegraph Museum in North Queensland will be putting on a display of old Morse code and old radio equipment on May 29 and 30. The location is the Historic Post Office, Telegraph Station, Old Shire Hall, Courthouse and Lock-up in Victoria Street, Cardwell.

More than over 70 Morse code keys, bugs, paddles, telegraph sounders and ex-military radios will be on display, with many visitors attending on both days, including school groups and RSL members. The Morse Key collection belongs to Mike Patterson VK4MIK and includes a variety from many countries and dating back to the 1880s, World War II and the Cold War era. Martin Ryan VK4FMJR will also have some of his extensive collection of military radios, some which played a vital role in war.

Admission is free, but donations to the Bush Telegraph Museum are very welcome.

The first DXpedition to Macquarie Island

Rob Gurr VK5RG

In the August 2014 issue of *Amateur Radio* Peter Wolfenden VK3RV reported on the remarkable life and achievements of Walter Hannam VK2AXH with significant references from various library records. Further records on the establishment of Sir Douglas Mawson's relay station at Macquarie Island are to be found on the Australian National Antarctic Research Expeditions (ANARE) website at *http://www.antarctica.gov.au/about-antarctica/history/exploration-and-expeditions/anare-is-created*

In addition, details of the adventures that resulted in the delays in the return of the 1911 party to Australia, may be found in detail, in *'The Home of the Blizzard'* by Sir Douglas Mawson, in 1915, currently available in most libraries throughout Australia. The expedition was the Australian equivalent of the adventures undertaken by Scott and Amundsen in their polar adventures; however Mawson was more interested in the scientific nature of the expedition, seeking a goal closer to the South Magnetic Pole than at the South Pole itself.

The need for a relay station at Macquarie Island was considered essential to achieve a reliable circuit from Commonwealth Bay to Hobart, in Australia. Wal Hannam's expertise establishing the station at Wireless Hill, at Macquarie Island, and the later station at Commonwealth Bay, in extreme circumstances, was quite significant.

The party at Commonwealth Bay, delayed by the late return by Mawson and his party, was tragic in two ways, one being the loss of two companions due to accidents, and the final disappointment to learn the ship had sailed without him, due to the packed sea ice. A small number of the party, including Hannam, had remained at Commonwealth Bay until the next summer, before they could be rescued. It is a true adventure story of Australian endurance (Reference 1).

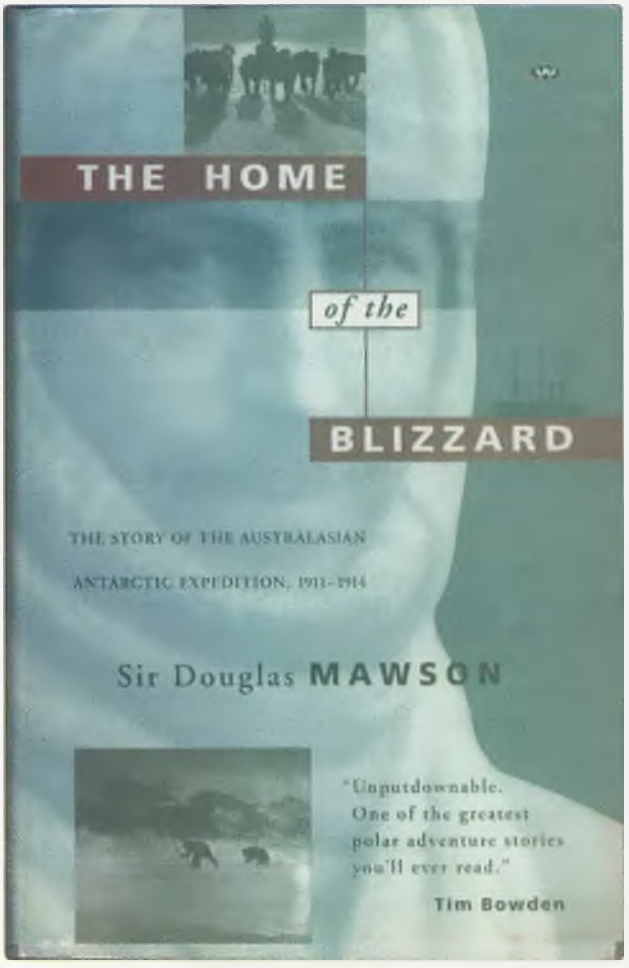


Photo 1: 'The Home of the Blizzard,' by Sir Douglas Mawson.

Why there have been very few later DXpeditions

Macquarie Island became a nature reserve some years ago, with millions of Australian dollars spent on the eradication of rats, rabbits, and cats, relics of the sealing days of the mid-1800s. Some passenger vessels are allowed to anchor there overnight, with tourists accommodated on board the vessel.

After World War 2 Sir Douglas Mawson encouraged the Australian Government to further consider their interest in the continent, with initial interest in the sub-Antarctic, Heard and Macquarie Islands. Heard was established in 1947 and Macquarie in 1948 following preliminary voyages carried out by the *Wyatt Earp*, with the Director of the recently formed Antarctic Division, Philip Law, aboard. The possibility of an ultimate base on the continent became evident, and eventually became a reality.

In the initial years of the Antarctic Division, a majority of ex-servicemen with skills acquired from service in the forces became available, and volunteered their services. Many were satisfied with their one year service with the Division, however, as they returned with reasonable rewards to enjoy life back in Australia, and with the International Geophysical Year approaching, it was obvious the need for a younger contribution was necessary.

There was an expectation by Philip Law that the men suited for work in the Antarctic should have 'Scott of the Antarctic' credentials.

Men were wanted that would be able to forget home life without worrying what was going on back there. The need to have radio telephone contacts with their families at home was not supported as the need to devote wholeheartedly to the adventurous aspects of their work was considered more important.

Initially the only contact was arranged by Morse code via the overseas telecommunications stations in Perth or Sydney, on frequencies shared with overseas circuits to Nauru, Vila, Rabaul, Port Moresby and so on. Amateur operators had a bonus with their own transmitters and equipment, and arranged contacts with other amateurs adjacent to their homes. Those of the amateurs who had no portable equipment with them had no difficulty setting up frequencies on the main commercial transmitters, and having high speed CW contact with their friends, who typed the 'personal' traffic, onto their typewriters, and posted the text to the relatives the next day.

I had my own private links... my YL in Sydney bought a BC348 receiver and listened to my radio telephone contacts each night, with a quick telegram from the local Post Office to QSL the previous night's transmissions. Telegram traffic at the time cost about four pennies a word, which meant you could be presented with a good bill each year, on return! An ANARE code, inspired by earlier expeditioners, was permitted for private telegrams; however most modified their text to completely change the meaning and keep some personal privacy. All traffic for our families was routed through ANARE, so that office could keep an eye on any 'leaks' of Government confidentiality. This was illegal, as the 'Statutory Delectation of Secrecy' that all radio operators had to sign was not required for the ANARE office staff.

In the early days of the post WW2 expeditions, few of the expeditioners were eligible for amateur licences, other than the radio operators. A special arrangement was allowed by the Postmaster Generals Department where qualified telegraphists, without Operator Certificates, were allowed amateur permits, providing the senior operator, or the radio supervisor, had one. In the cases I knew about, all operators were usually from a WW2 service background or with extensive experience as PMG telegraphists. With improvements in radio telegraph and radiotelephone facilities, the need for Morse code qualifications became inappropriate.

Antenna improvements 1952/53

With four of us using the amateur bands at various times, sometimes with the need for urgent commercial traffic, I volunteered my own home brew rig to be used as the main amateur rig, thus releasing the commercial transmitters to the station only, and saving the tortuous job of retuning them when used for the amateur bands.

I now had a wonderful opportunity to experiment with long wire antennas, with no trouble from neighbours! Coincident to my enthusiasm to keep the amateur equipment separate from the commercial installation I

undertook initially to set up a 150 metre 'vee' beam, but with the 100 knot winds at Macquarie this was short lived. I had arranged to use two prominent rocks on a nearby penguin rookery, but even with the Government supplied six mm hard drawn copper, broken wire became a nuisance. This became a menace to the other members of the party, with dangerous entanglements, and creating horrible sounds, and additionally of danger to the seals and penguins.

The general purpose antennas at the earlier ANARE bases were simple Baldock arrays consisting of one 22 metre mast, in an inverted Vee form, with a base of up to 100 metres, end fed from the transmitters, and terminated by a 600 Ω load, usually carbon filament lamps in series/parallel. This gave a significant gain on the higher frequencies, and a broad unidirectional lobe, to the target area. I also tried a phased array along the lines of the ZL Special, at that time popular with the amateur fraternity, with selection of the front and back firing option (G8PO).

I became obsessed with the phased array, and with the agreement of the radio physicist, also a ham, enlisted the use of his ionosonde tower for such an attempt. With his tower, and the main communications tower, I erected a four element phased array with the top element at 20 metres and the bottom at 15 metres, within an overall length of 60 metres. This was known in the amateur terminology as a 'Lazy H', and was constructed with standard commercial insulators, with a 600 Ω line feeding from the radio shack to the array, mounted on a stable gantry, to combat the seals!

This antenna, proved most useful on the 21 MHz through to the 7 MHz bands, and was so successful on the commercial frequencies that it remained in use for a number of years. I arranged for suitable switches to be available to enable a simpler changeover to the commercial rigs, to obtain its useful gain from time to time.

I had great pleasure when I returned to Australia in 1953 in conducting frequent tests with my brother in law, VK5AF, by then the relieving radio supervisor.

Photo 2: Macquarie Island ANARE base in 1953.

Leisure life

There was none.

Many issues required additional assistance in one form or another. Over the first years there were extensive building activities, the responsibility of the carpenter but with continued assistance from other expedition members mixing cement and assisting in erecting buildings. The doctor needed assistance with the daily penguin, bird and seal count, to address the biological programme. The three meteorologists sought help with balloon and radiosonde launching. The geophysicist needed charts to be changed when he was on field trips, to his seismology and magnetic equipment. He needed some help on ding nights, changing film reels on the projector. The radiophysicist sought assistance with the daily update of the state of the ionosphere, and the monitoring on ancillary equipment, such as 2.5 MHz from WWV. The cook wanted continuous support for fuel, relief on Sunday, foraging for sheep and goat stock. The radio supervisor needed support with the electronic service and installation work, and OIC of the radio system, and the radio operators, with the supervisor, working 24 hours on and 48 hours off, with traffic and interception of signals from various international weather stations.

The chance of an expeditioner finding time to operate as a 'DX' station, with a pile up of stations, would have been extremely difficult.

Heritage Expeditions forthcoming trips, as detailed on the website indicated below, may be useful, but you may be lucky if you can spend a complete day on the island (Reference 2).

ANARE are continuously offering employment on the various bases, with a number of possibilities for amateurs as expeditioners, for a 12 month stay, and sometimes with support from other professional research establishments, offer a short 'summer' project.

References

1. *http://ngm.nationalgeographic.com/2013/01/125-mawson-trek/roberts-text*
2. *http://heritage-expeditions.com/trip/macquarie-island-expedition-galapagos-southern-ocean-22-dec-2015/*

ARDF 2015

Jack Bramham VK3WWW, WIA ARDF Coordinator

Firstly, accept my apologies for not providing a detailed report. In September 2014 VK3TJN, VK3VT, VK3OW and VK3FJTE headed to Burabay in Kazakhstan to compete in the 17[th] IARU World ARDF Championships. In total 277 competitors made up from 24 IARU societies participated. Finding enough accommodation for this number of people must be tough for the organisers but the Kazakhstan Federation for Radio Sports and Amateur Radio (KFRA) were fortunate to have a ski resort village with many Hotels very close to the competition areas. In the past, ARDF events only consisted of two competitions where open competitors hunt five transmitters. Bands for both events are 2 m and 80 m. Now they have added two extra events, namely the "foxor" and "sprint". In classic ARDF you have five transmitters on the course and each transmitter is active for one minute in five. Signals are quite strong and mostly can be heard in all parts of the competition area but they are not marked on the map. Foxor is more like orienteering where the controls (in our case transmitters) are not exactly marked on the map but a circle is and the idea is to use a map and compass to navigate to the circle and from there you should be able to receive the weak transmission from the fox. Transmitters for this event are continuous.

ARDF Sprint events are different again. In an effort to make ARDF a spectator sport they have devised an event where there are two courses and many frequencies. Main object is to get as many of the transmitters as possible: finish course one and then start course 2 and do it all again. I don't mind admitting it, but this type of event confuses the hell out of me. But, I am sure eventually I will wonder

Category M60

31 Com — Foxes 11 12 14 — Route 4420m

Place	Name, First name	Club	Call	Run time	Fox	StNo
1.	Guliev, Chermen	RUS	UA3BL	32'45	4	171
2.	Höfner, Bernd	GER	DL1AQ	33'51	4	13
3.	Mukhitov, Nazhib	RUS		34'40	4	172
4.	Velikanov, Mykola	UKR	UT1UC	35'54	4	113
5.	Kochergin, Alexandr	KAZ		38'48	4	285
6.	Kovacs, Attila Gabor	HUN		39'45	4	190
7.	Götte, Heinrich	GER		43'02	4	14
8.	Masao, Ono	JPN	JR1EYZ	43'53	4	220
9.	Boev, Vlad	GBR	2E0VLB	46'09	4	81
10.	Laszlo, Karoly	HUN		46'59	4	189
22.	Bramham, John	AUS	VK3WWW	60'40	4	137

Photo 1: The results table for the M60 80 m event.

why I never understood it. This type of event gives spectators a chance to line the course 1 finishing chute and cheer their team.

For those of you reading the downloadable version of *AR*, here is a link to a great description of ARDF: *https://www.youtube.com/watch?v=tl4HztSY8Mo*

Now back to Kazakhstan. I am sure many of you are wondering how we went at the championships. Actually not that well. But, on the other hand if you remove Region 1 and Region 2 we were quite competitive. As an example of how tough was the competition, in my first event on the 80 m band I found all of my transmitters in just over an hour, well within the time limit. For once I made no mistakes and went the most direct route between each transmitter and for that reason was quite happy with my result. Then reality struck home! Winning time for that event (M60-70 Category) was 32 minutes 45 seconds. Unless you are an elite competitor, winning is not an option but you will find that there are a lot of sub competitions mostly friendly rivalry between competitors.

We all had a great time, caught up with old friends and made some new ones. I did however make a few videos whilst in Kazakhstan and these can be viewed from the following links:

Opening Ceremony
https://www.youtube.com/watch?v=A38mOtPfNW4

1st Classic ARDF Event
https://www.youtube.com/watch?v=r2sUHvWcjpc

2nd Classic ARDF Event
https://www.youtube.com/watch?v=DMO-4Yf58XE

All of these videos were edited in Astana Kazakhstan and uploaded using the hotel Wi-Fi. I wonder if they worked out who used up many GB of the monthly data plan?

For Region 3, the next international event will be the 10th region 3 ARDF Championships to be held in Shibukawa-shi Japan. Here is a link with more information:

Photo 2: "Nah, its not cold at all!" VK3FJTE, VK3OW, VK3TJN and VK3WWW. Photo by Greg Williams VK3VT.

http://www.ardf.org.au/events/ns0_20150129035534_Bulletin1.pdf

This event will be held in September 2015 from the 6th-12th. At this stage I am not sure how many will travel from Australia but if you need to know any more information please email me *vk3www@wia.org.au*

During the year most of the ARDF activity in VK is in VK3. So, if you are planning a trip to Melbourne and would like to try ARDF please contact me and if possible we could get you to one of the local events. At this stage the Calendar is not published but on an average there is at least one event per month.

In 2016 the next World ARDF Championships will be in Bulgaria: this will be followed by Regional Championships in 2017 and then the following year will be the World Championships. 2018 is interesting, for it has been decided that the 2018 World Championships must be in Region 3. At this stage KARL (Korea) have stated that if no other society will host them, they can. Korea has hosted the World Championships before in 2008, also China in 2000 this leaves Australia and Japan. If Australia were to host the event in 2018, we would really need a lot of assistance both financially and volunteer wise as we are a small group. So far Australia has hosted three Region 3 Championships: Townsville Qld 1999, Ballarat Vic 2003 and Maldon Vic 2011 and without the assistance of local amateurs, ARV and the WIA it would have been even more difficult.

Photo 3: A view of part of the Opening Ceremony. Photo by Jenelle VK3FJTE.

The Ultimate in Portable Antenna

BUDDIPOLE

Dipoles, Slopers, Vees, Verticals or 'you name it' are just some of the antenna configurations possible with **Buddipole** components.

A Buddistick contains the following:

- 2 x 280 mm Anodized aluminium arms
- 1 x Stainless steel telescopic whip
- 1 x Multiband loading coil and coil clips
- 1 x 9.5 m radial wire on line winder
- 1 Mounting plate with SO239 adapter
- 1 x Compartmentalized portfolio bag
- 1 x Operating manual

The Buddistick deluxe kit also includes:

- 1 x Vertical antenna clamp
- 1 x Additional stainless steel whip

A basic Buddipole kit contains the following:

- 1 x VersaTee center section
- 2 x Stainless steel telescopic whips
- 2 x 560 mm Anodized aluminium arms
- 2 x Multiband loading coils and coil clips
- 1 x 7.6 m coaxial feed line with choke balun
- 1 x Black thermoplastic carrying case
- 1 x Operating manual

The Buddipole deluxe kit also includes:

- 1 x Portable 2.4 m mast and base tripod
- 1 x Rotating arm kit- change configurations
- 3 x Extra coil clips
- 1 x Additional telescopic whip
- 1 x Antenna system bag – padded nylon with shoulder strap
- 10 page modeling report

Accessories

Long (5.48 m) telescopic mast, Low band coils and extended whips, Shock cord whips and Shock cord masts, Light weight mini coils, Knurled whip protection sleeves, Switchable 1:1 2:1 4:1 baluns, Capacity hats.

All Buddipole components are available for purchase as individual parts.

Supplied by

tts systems

Phone **03 59774808**
Fax **03 59774801**
Email info@ttssystems.com.au

Visit us on: **www.ttssystems.com.au**

The stealth antenna grows wings

Ron Holmes VK5VH

In the July 2010 and July 2011 editions of *Amateur Radio* you will find articles on my 'X beam' 40 metre antenna hidden behind my unit. It was given the title 'Stealth Antenna.' Wish I'd thought of that, but the Editor was responsible. So my latest addition to that arrangement I am calling 'The stealth antenna grows wings.'

To begin with, I would like to make two points. One is that even if you don't have problems about needing to hide antennas this article may still have value for you. The ideas, or your adaptation of them in unrestricted space and height, could work a lot better. The other is that I am simply a 'cut and try' antenna builder who likes trying new ideas. I have not seen this exact arrangement in any book over the past 75 years that I have been reading them. Perhaps I should say that I don't remember seeing it.

I do remember the first ever copy of Radio and Hobbies arriving in our roadside letterbox in April 1939, the year I turned fifteen. I did the correspondence course on radio servicing advertised on the back. At eighteen I joined the RAAF as a trainee wireless mechanic. Halfway through, after a 100% mark in the examination on receivers (I'd done it all before), I was sent off to radar school: something I didn't know existed. Very few people did. I became a radar mechanic and served three years until the war ended.

The reason I give this background is that I am not a radio engineer. I did not design this antenna on a computer and would have no idea how to do so. It just seemed a good idea at the time and it fitted in my back yard out of sight. However, I and a number of others are surprised at how well it works.

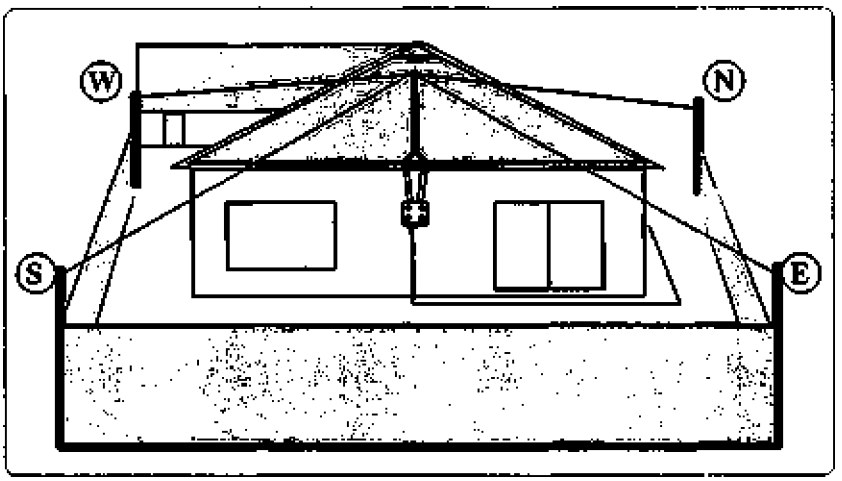


Figure 1: This is the original simplified computer drawing of my X beam from AR July 2010 and AR July 2011.

Since it is a combination of vertical and horizontal radiation I would really like to call it the VH antenna. I wonder why?

See page 30, *AR* July 2011 for the improved version with vertical sections at the centre separated. I have used the original simpler drawing to show the added 1/2 wave sides with vertical helical sections at their centre. The central poles are four metre lengths of 40 mm outside diameter PVC piping mounted on wooden bases three metres long. The bases stand on the ground and are bolted to the fence post. This enables them to be erected without leaving terra firma - important at my age! The tops of the PVC carrying the helical winding are between five and six metres high. Note that the north and west ends of the side antennas are insulated. It is not a loop.

What lead me to the design of this antenna? Well, I had been looking at the ARRL Antenna book, 17th edition, a mighty volume. I was reading Chapter 8 on multi-element arrays. On pages six and seven, Figure 10, I found a double page of patterns for two identical parallel driven elements spaced and phased as indicated. It told me that two half wave elements, each fed 180 degrees out of phase, 1/4 wavelength apart, would have significant gain in both broadside directions. The same would apply to 1/4 wave verticals. Also, with a little less gain, if the elements were 1/8 wavelength apart.

Well, my X beam had a pair of opposite half wave elements I could feed 180 degrees out of phase, that is, in opposite directions. This was an easy matter with the little feed box on the wall at head height. But they were each V shaped with the pointy parts facing one another, not straight and parallel! The ends were ¼ wavelength apart but the middles were close to one another.

However, reading 'H.F. Antennas for all Locations' by LA Moxon, also packed full of interesting stuff plus a lot I couldn't understand, I noted that an X beam could be considered as a W8JK antenna, that is, two parallel dipoles fed in opposite phase. However, in the case of the X beam, with the effective distance

Photo 1: A view of the antenna on north-west side of the unit.

between them considerably less than at the ends. Could it be close enough to 1/8 wavelength to have at least some gain? I had no idea, but it might be worth trying.

Then a bright idea dawned. The ends of my X beam were attached to three metre high poles mounted against my fence, two at the back corners of my 10 metre wide back yard, the other two 10 metres further forward up the side fences, which are ten metres apart. Ten metres being a ¼ wave on 40 metres, if I could fit a half wave antenna up each side above the fences and feed them 180 degrees out of phase, I would have the requirements for an effective two-way beam on 40 metres facing NE and SW. If I fed them off the back ends of my X beam dipoles, any gain it had would be NW and SE. Assuming that the X beam part would cover the other two directions I would have an omnidirectional antenna system with, hopefully, some gain.

Only one problem - how to fit 20 metres of wire between poles 10 metres apart. Of course, one could always put a loading coil each end, or drop down a tuning stub of 300 Ω twin feed a couple of meters or so long, to keep the highest current and best radiating section in the middle.

Photo 2: 'Wot! No antennas?' Ron's unit from the front.

But to my mind this meant wasting nearly half the length of the side antennas. Why not put a helical vertical in the middle and use all the wire? It would mean adding a few extra metres to the 20 to make it resonate on 40 metres, because wire wound helically is always considerably longer than its effective helical length.

But then I usually make antennas a few metres longer than the book says, and clip bits off until I have a 1-1 SWR. I do use a dip meter to get a rough idea, but final lengths are determined by radiating a CW signal and looking at the power output and SWR meter. Of course it means keeping the ends reasonably low and a lot of climbing step-ladders and running back and forth from the shack to the antenna, but they tell me exercise is good for you!

What about results? Well, the first time I used it was about 10.15 pm one Sunday night. That afternoon one of my sons had helped me with the final touches but I did not have time to test it on air due to other commitments. I was home in time to join my regular Sunday night 9.30 pm net on 80 metres. This is worked on my 'roofwire' antenna: a random length of wire lying on the tiles, end fed through a 'Transmatch' ATU I built about 40 years ago.

Afterwards I switched to 40 metres with the new antenna which is self-resonant on that band, no ATU needed. Hearing a CQ call I replied to it and, to my amazement, AF6TC Mark in Sandiago California came back at 5/9. He gave me 5/6 and we had a Q5 conversation. It was 6 am there. Of course, like most of the Americans, he was using a big beam and 1000 watts, which helped both ways, but frankly I have rarely worked DX on 40 metres, nearly always using 20 or 15. A report of 5/6 using 100 watts on a low wire antenna to the states quite startled me.

I am old enough to know that one contact is not enough to determine the usefulness of any antenna, but it was a nice start. Since then I have recorded carefully the results on 40 with many stations. All have said I had a good signal. The important ones are with stations I have worked fairly regularly over a long period. Most report that they have never heard me so well.

I am sure that Peter VK2NEO at Griffith, who has an exceptionally good antenna system and usually comes through to me at 20 over 9 and normally gives me 5/9, will not mind me reporting that with the new antenna I was 20 dB better. On my little FT-897D transceiver S meter he, for the first time, brought up a double plus sign, meaning that he was more than 30 over!

Incidentally, I tried it on 80 metres using the "T" transmatch to tune it. On receive it was much less noisy than the roofwire. S9 is the usual noise level on 80 at my QTH, but those on the net said they did not receive me as well as on the roofwire.

A modelling approach to antenna construction (Part 3)

Evolving the design and making predictions, based on the "Weekend Dipole"

Stephen Ireland VK3VM/VK3SIR

In the first of this series you may recall that I introduced basic terms, revised EMR and some of the issues associated with EMR, and introduced the concept of modelling as a way of coming up with a set of parameters that could be useful in helping us to construct a safe antenna system.

In the second article a brief tutorial was provided to enable a basic model of a dipole for 40 m to be constructed in 4Nec2.

In this article a set of basic steps will be provided to get you started with using 4Nec2 to optimise and evolve your model for your approximate environment. Once we have an optimised design we can see how this antenna behaves on other bands. Finally we can look at producing a "near field" model to examine possible EMR implications.

Recap

In the last article we went through the steps to develop a basic model for our 40 m dipole in 4Nec2 at 7 m.

By luck the SWR of the antenna at this point is not too bad – being at 1.3:1 at 7.100 MHz. Many would call this excellent – but the software can mathematically provide better solutions.

Evolving the design

Evolving and optimising designs involves replacing fixed values with variables. As mentioned earlier, every antenna at every site is a compromise; In this case I am going to assume that we cannot raise or lower the antenna from 7 m in

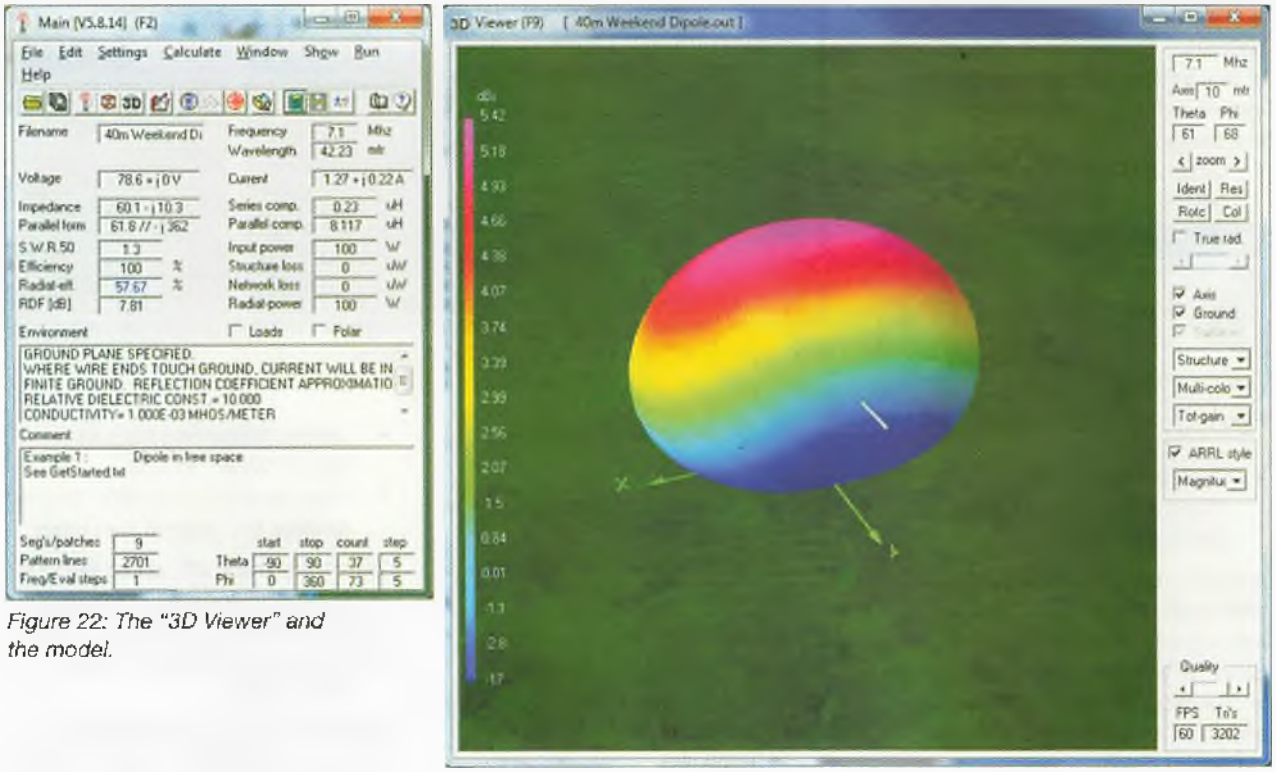


Figure 22: The "3D Viewer" and the model.

height. Therefore the only option available is to reduce the lengths of each arm.

Establishing variables/symbols

We are going to set up a variable (called a "symbol" in 4Nec2) named "length" and initially assign this a value of 10 m. Symbols are established under the "Symbols" tab in the Editor:

- Select the "Editor" window if it is not focussed. See Figure 23.
- Select the "Symbols" Tab
- In the first available box, enter "length=10"

This has set up the variable "length". Now we need to replace all relevant "Geometry" field parameters with the variable "length" instead of 10. Any negative values need to be entered as "- length"

- Select the "Editor" window if it is not focussed. See Figure 24.
- Select the "Geometry" Tab
- Adjust Y1 to be "length"
- Adjust Y2 to be "length"

It is really this simple.

Evolving and optimising the design

Evolving a design is the process of getting the values within "the rough ballpark". Optimising is the process of fine tuning. You should always evolve a design before optimising the design.

- Close any windows in the Editor before you start.

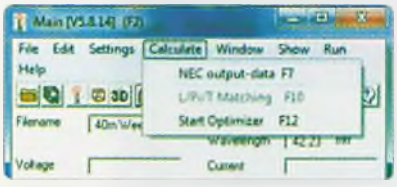


Figure 25: The "Calculate" menu

- Back in "Main", select "Calculate" / "Start Optimizer". See Figure 25.

A rather complex window is displayed. We want to "Evolve" the variable "length" for the lowest SWR. This involves changing values in "function", selecting the variable, and then weighting the software to evolve for SWR.

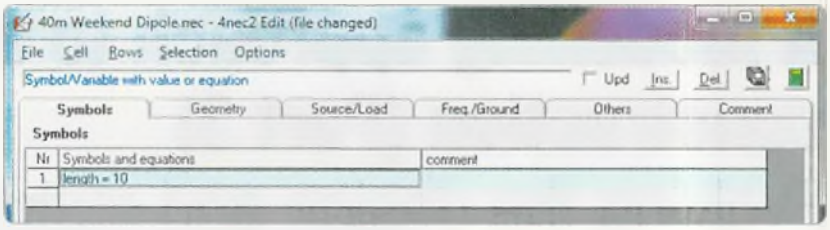


Figure 23: Editing in a symbol for "length".

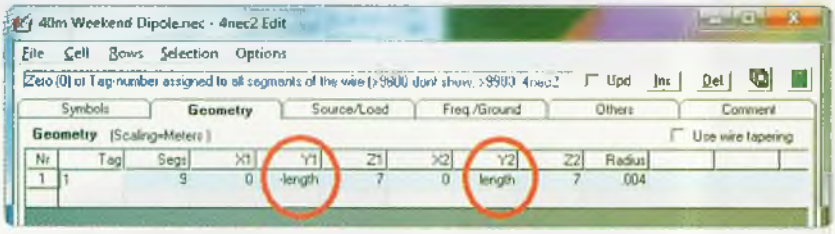


Figure 24: Editing The fixed "Y" values for the symbol "length".

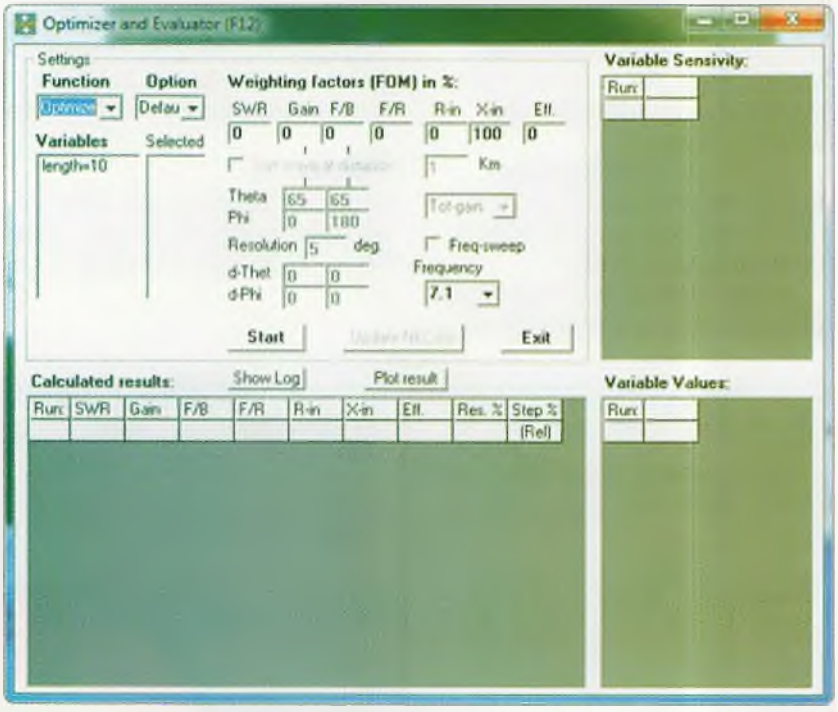


Figure 26: The "Optimizer and Evaluator" panel.

- Under "Function" Select "Evolve"

The whole population of the window will now change.

- Under "Variables" select "length".

By default the software will try to solve between the values 5 as a minimum value and 20 as a maximum value. You can adjust these if you like.

- Under "Weighting Factors" adjust "SWR" to 100
- Click on any of the other boxes to clear the original X-in value.

We could "trade off" some factors, such as SWR for gain in terms of the mathematical solution. In this case we will just solve for SWR.

- Click "Start".

The software will then attempt to solve for a situation where it detects

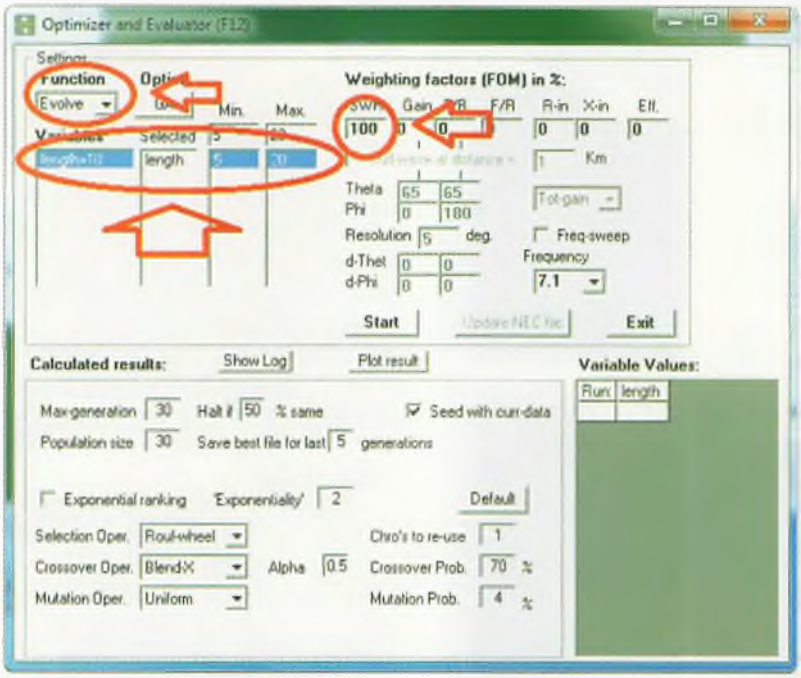


Figure 27: "Evolving" a model for lowest SWR.

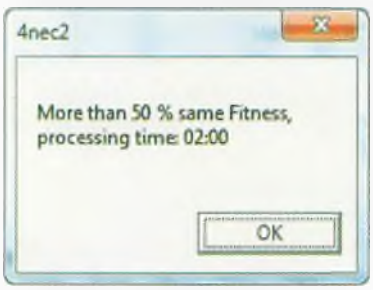


Figure 28: Evolved value reached.

no changes in the values that it is simulating for:

- Click "OK".
- Click "Update NEC File".

You will be prompted for the simulation "Generation" to save. This is the set of data that has been calculated as best meeting the simulation parameters.

Figure 29: Full view of evolved data.

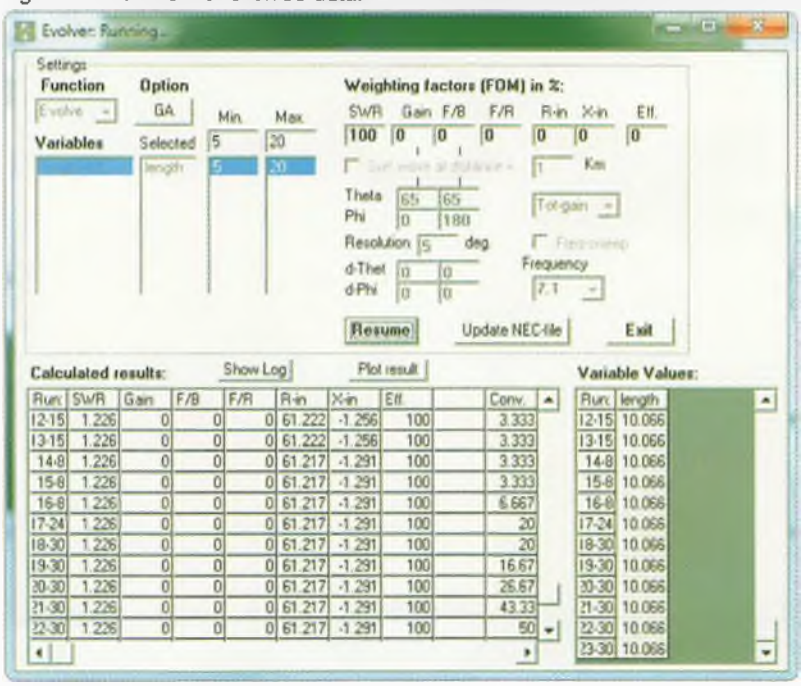


Figure 30: Selecting the generation of data to apply.

Note, as shown in Figure 30, that you have the capability to over-ride what the system has calculated if you like.

- Click "OK".
- Save the evolved model.
- Exit the Optimizer

A value of 10.066 m per arm length has been evolved. Now we need to optimise this value.

- Back in "Main", select "Calculate" / "Start Optimizer"

See Figure 31.

- Under "Function" Select "Optimize" (the default)

The optimisation factors should still be the same from the last "evolve" step:

- Under "Variables" select "length".
- Click "Start".

See Figure 32.

You can click "resume" a couple of times as this may solve for even more accurate values. But remember – this is a model that assumes perfect circumstances and no external interactions. This may be pointless.

- Click "Update NEC File".
- Save the evolved model.

We now have an optimised arm length at 10.044 m.

Comparison: model to real world

In reality the model here fell extremely close to prediction. The Weekend 40 m Dipole was implemented as an Inverted V and had to be shortened by exactly 42 cm in its implementation at Wallaroo, South Australia.

We know that when a dipole is implemented as an Inverted V, we should shorten each arm by

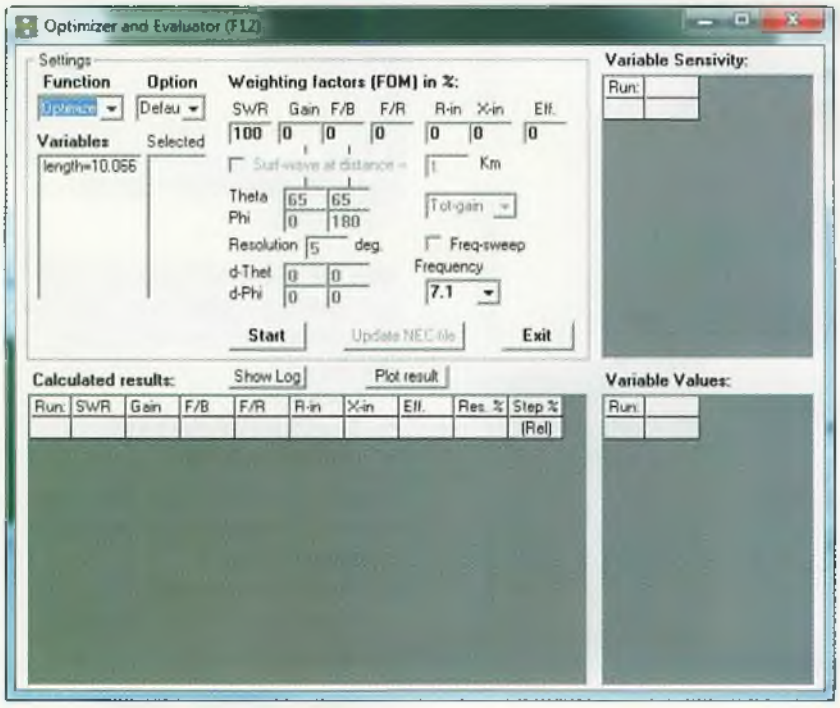


Figure 31: Using the Optimize Function.

Figure 32: Notification that optimised data obtained.

approximately 5%. This would mean that the length of each arm should be around 9.62 m. In reality the arms turned out to be 9.58 m in length each. Therefore this has proven to be relatively accurate in this application.

So what is the point? I still had to rely on the old "up and down", check with analyser, shorten and lengthen method. But the point is I had a relatively accurate optimised design to start with. The amount of iterations of adjustment was considerably lessened. Also the amount of material wasting and scrounging for construction materials was minimised.

A hint for NEC modelling

One of the most challenging yet poorly documented issues is how to deal with wires of varying lengths – such as an off-centre-fed wire antenna. When initially investigating these products it took quite a number of amateurs (including myself) a considerable amount of time to "re-discover" this technique – so to make it easier for all amateurs I shall document the discovered technique here.

In the case of an antenna such as an OCF antenna you may like to optimise the lengths of each arm. All NEC modellers place the feed point within the centre of a defined segment somewhere along an antenna element – so how can you position the feed point? Positioning the feed point along wires becomes critical with regards to estimating its performance.

The answer is that you will need to create a small, 1 segment element onto which to place the feed point as demonstrated in Figure 33. You can think of this as being akin to putting a centre insulator onto a wire antenna (although this does not mathematically serve the same purpose). You then join the wires that you may resize (manually or via optimisation) to this lone segment. Note that when you optimise and evolve the model you optimise and evolve the length of the arms attached to this centre piece – do not evolve the length of this element.

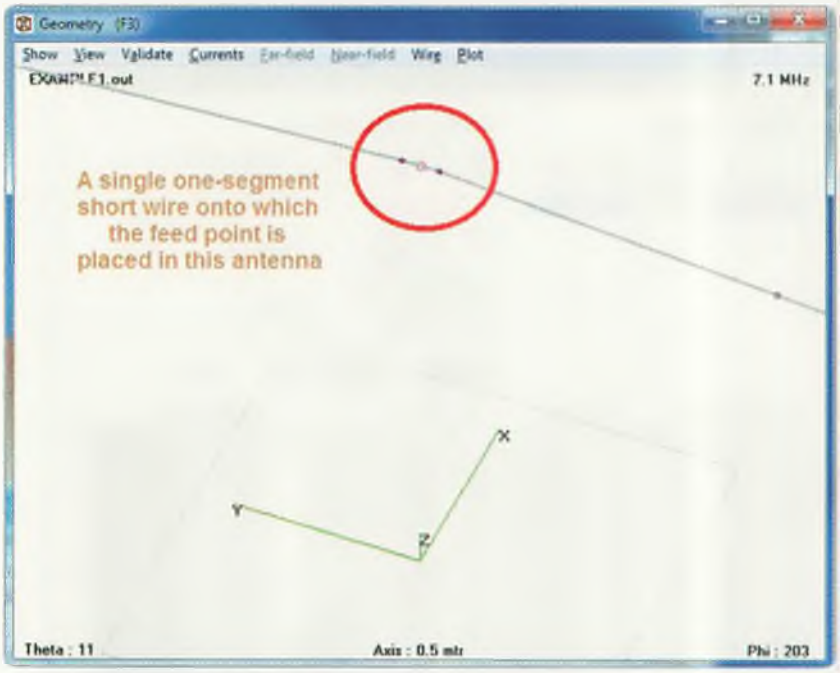


Figure 33: Hint for antenna with uneven arm lengths.

Once you build up your own library of working applications then tailoring these to your situation becomes simple.

Frequency sweeps

A brilliant ability of the tool is the ability for the software to simulate how the antenna is likely to perform on other frequencies (i.e. as a doublet).

- Close any open editor windows.
- Go back to the "main" 4Nec2 Window

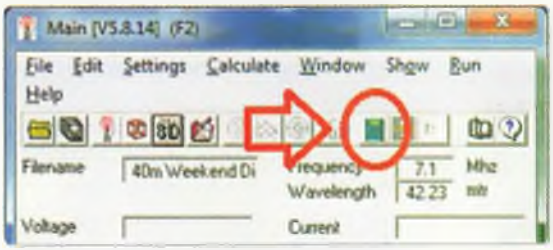


Figure 34: The "main" panel and the "Calculate" icon.

- Click on "Calculate"

Figure 35: Calculate a "Frequency Sweep".

- Click "Frequency Sweep"

The "FR" setting specifies the Start Frequency, the stop Frequency and the "Stepping" between frequencies. In this example I will adjust the start frequency to be 7.0 MHz, stop at 30 MHz, and step at 0.25 MHz intervals:

- Click "Generate"

As you can see from the model this antenna would have limited application except on the 40 m and 15 m bands (even with most tuners). For a more complex antenna this can be an invaluable tool when one cannot afford a Vector Network Analyser.

This is an exceptionally useful aspect of these modelling tools.

Near Field simulation

Last but not least we need to understand what our designs may be doing to us and our environment from an EMR perspective. This can be estimated by performing a "Near Field" simulation based on the optimised design.

Figure 36: Calculate a "Frequency Sweep" from 7 – 30 MHz at 0.25 MHz Steps.

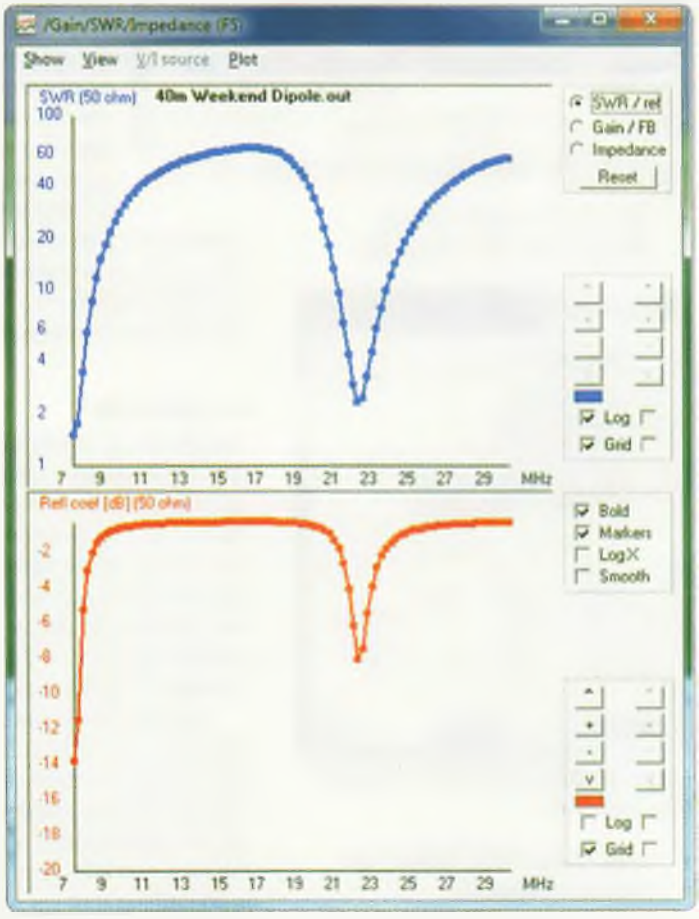


Figure 37: An estimated "Frequency Sweep" from 7 – 30 MHz at 0.25MHz Steps.

First we must set the power level that we are going to input into the antenna system.

- Go back to the "main" 4Nec2 Window
- Select "Settings" / "Input Power"

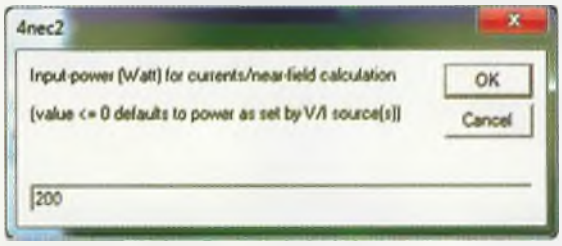


Figure 38: Setting the Input Power for the Calculation.

By default power is set at 100 W. For this example we will increase power to 200 W.

- Enter 200 as shown in Figure 38
- Click "Ok".

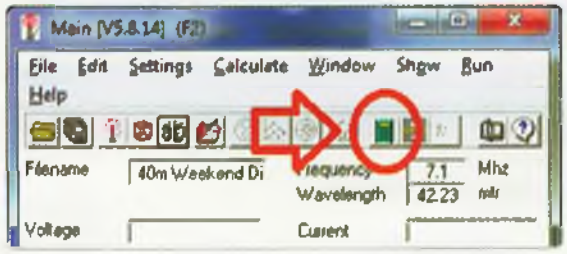


Figure 39: The "main" panel and the "Calculate" icon.

- Back in the "main" 4Nec2 Window click on "Calculate"

Figure 40: Setting the Input Power for the Calculation.

- Click "Near Field Pattern" as shown in Figure 40.

In the above graphic I have adjusted default values to estimate the electric fields ("E fields") 20 m around the antenna in the X plane and for 50 m upwards (in the Z plane) in steps of 1 m. Remember that it can only take a "thin slice" when it performs this estimation. Being on the "Z" plane this should be at the centre of the antenna – which from the far field models performed earlier we know is the point of greatest gain.

- Change "Step" values to 1.
- Click "Generate".

You can "hover" the mouse over any point on the image to get an estimate of the intensity of the electric field at that particular slice (or "circular aperture" as it can be mathematically termed).

As you can see this can be an extremely useful tool for estimating whether or not an object within the proximity of the antenna system is potentially exposed to field that may be in excess of permitted standards. This could be a highly useful tool for providing evidence to the ACMA if the evidence is demanded.

In summary

Modelling is a highly useful tool in this day and age – especially when we cannot afford the equipment ourselves. It is an excellent tool for estimating the abilities and capabilities of our systems. It allows the amateur the ability to trial a potential solution without actually implementing that solution.

From an EMR perspective it allows you to understand what your antenna is doing and how it is directing energy. Modelling allows you to better predict and understand the localised effects of EMR which is something that we are required to do as part of our LCD if requested.

Yet it has its limitations; we cannot factor in everything nor model every circumstance.

I would like to encourage all amateurs to look into all these forms of tool because you never know when you may receive a letter or a knock on the door and receive a request to submit an EMR survey. 90 of us did during the high power trial and I understand three stations received actual physical inspections. Having knowledge of these areas also primes us to think about safety – and to be able to defend the safety of amateur radio against the uninformed hype if challenged.

Remember if you do have any issues then please always contact the WIA for assistance as there are plenty of highly competent Amateurs out there only too willing to assist.

73

Steve Ireland VK3VM / VK3SIR

References for the complete series

Special thanks must be extended to Doug McArthur VK3UM especially with regards to comments provided on the regulatory aspects covered here. Also special thanks must be offered to Lino VK3EI for his assistance with 4Nec2 and John VK3DQ, Peter VK3ADO and Keith VK3FT for their assistance and advice with proofing this series.

- *http://www.youtube.com*
- *http://www.youtube.com/watch?v=S01SoDJxvmo*
- *http://www.youtube.com/watch?v=bEIWUid_wio*
- *http://www.youtube.com/watch?v=3AqMq0J3WBc*
- *http://www.youtube.com/watch?v=kYy6Yur127A*
- *http://www.youtube.com/watch?v=R5jUMxjJS8g*
- *http://www.youtube.com/watch?v=IXpPc2cKNUU*
- *http://www.nec2.org*
- *http://en.wikipedia.org/wiki/Numerical_Electromagnetics_Code*

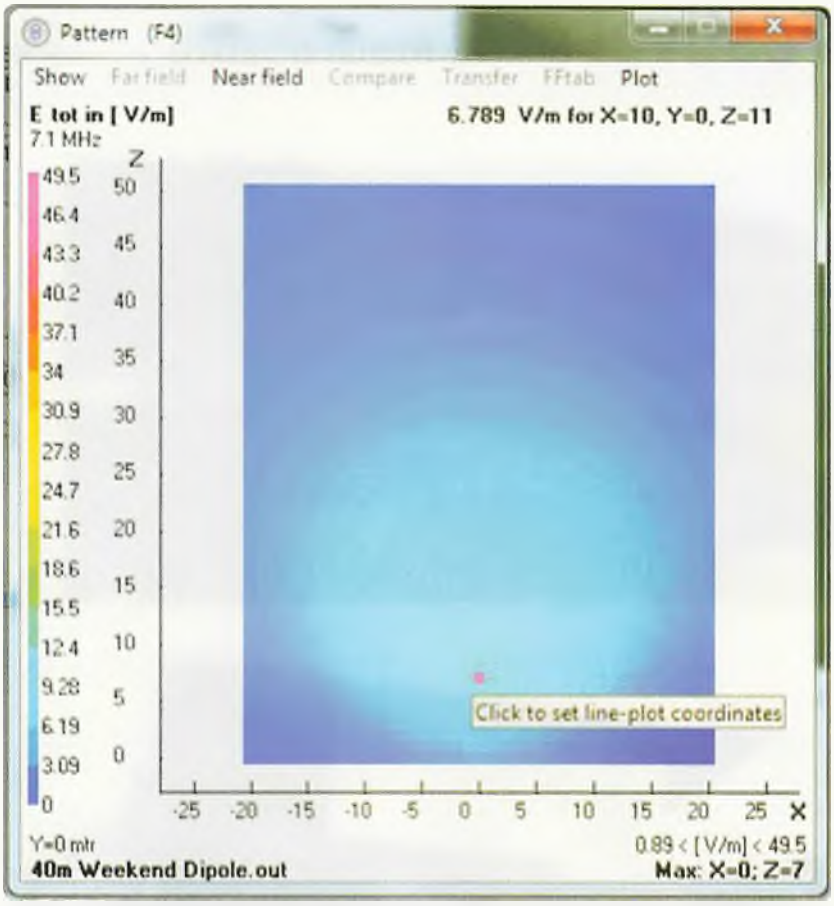


Figure 41: Estimate of the Near Field Intensity at a particular "slice" on the antenna.

- *http://www.blackcatsystems.com/software/mininec.html*
- *http://www.eznec.com/*
- *http://hamsoft.ca/pages/mmanagal.php*
- *http://www.w7ay.net/site/Applications/cocoaNEC/index.html*
- *http://home.ict.nl/~arivoors/*
- *http://www.comlaw.gov.au/Details/F2013C00368/Download*
- *http://www.arpansa.gov.au/Publications/Codes/rps3.cfm*
- *http://www.vk3um.com/emr%20calculator.html*
- *http://www.home.agilent.com/upload/cmc_upload/All/NSI-near-far.pdf?&cc=AU&lc=eng*
- *http://electronicdesign.com/energy/what-s-difference-between-em-near-field-and-far-field*
- *http://upload.wikimedia.org/wikipedia/commons/5/5d/FarNearFields-USP-4998112-1.svg*
- *http://electronicdesign.com/site-files/electronicdesign.com/files/archive/electronicdesign.com/content/content/74017/74017_f3.gif*
- *http://www.acma.gov.au/~/media/Radiocommunications%20Licensing%20and%20Telecommunications%20Deployment/Information/pdf/Human%20exposure%20to%20EMR%20Assessment%20of%20Amateur%20Radio%20Stations%20for%20Compliance%20with%20ACMA%20Requirements.PDF*

Rosebud Kite Festival Sunday March 8th 2015

John Fisher VK3DQ

Photo 1: An overview of the festival site.

The Kite Festival is an annual event held over the long weekend and as you can see is very popular and draws a large number of people.

So a very suitable place to show amateur radio to the public especially if we can use a kite antenna!

Lino VK3EI , Steve VK3VM, John VK3DQ accompanied by Jean VK3VIP (President of ALARA) and Donna VK3FRET, met up with John VK3BSR, the President of the SPARC club, to operate a demonstration station.

The Radio used on HF was an Icom IC-706MK2G into a kite antenna consisting of a 40 metre wire section attached to the kite, a ground system using a wire fence which ran for many 100s of metres along the edge of the sand dunes and an MFJ Balanced / Wire tuner.

Contacts were made mostly on 40 metres within Australia but some international stations were worked on 20 metres and 10 metres.

A number of members of the public visited the station during the day and some calling CQ pamphlets were handed out.

We hope to see you at next year's Kite Festival.

73.

Photo 2: An overview of the amateur radio station.

Photo 3: Here we see Steve VK3VM and John VK3DQ operating the station.

Frank Miller VK5BF: Pioneer radio experimenter in Murray Bridge

Lloyd Butler VK5BR

To those interested in radio in the town of Murray Bridge, Frank Miller was a legend. Frank was a member of the Army Signal Corps in World War 1 and assisted in the development of the teletype whilst in the trenches. He returned to become the pioneer radio experimenter within the town.

Photo 1: Frank Miller.

Foreword

Francis George Miller was born in Maitland, South Australia on 28 August 1895. At an early age, he joined the 32nd Battalion Signal Corps which was part of the 8th Brigade raised in the Adelaide suburb of Mitcham in World War 1. On 18 November 1915, he embarked on HMAT Geelong from Adelaide and proceeded via Egypt to the Western Front in France. In July 1916, the 32nd Battalion fought in the battle at Fromelles, France and in September 1917 in the Battle of Polygon Wood in the Ypres Sector of Belgium.

Frank was a signaller during the 1914-18 war in the Australian Corps of Signals which is one of the arms of the Australian Army. The Corps is responsible for installing, maintaining and operating all types of telecommunications equipment and information systems. Whilst working in the trenches, he assisted in the development of the teletype machine. For this work, he was credited with its development by the Signal Corps. Acknowledgement of this achievement was sent to his parents by cable from London.

The early experimental years

Returning from the war, Frank settled in Murray Bridge and very soon became the pioneer radio experimenter in that town where he remained for most of his life. To others who showed the slightest interest in the then early developing wireless, he helped and encouraged them to get into this new branch of technology. He helped a number of enthusiastic starters to qualify in the Broadcast Operators Certificate to enter the broadcasting field and to qualify in the Amateur Operators Certificate. For those who he helped along the way, he was a legend. (The writer was one of those he helped).

Frank joined the South Australian branch of the Wireless Institute in 1921, only two years after it was formed and only three years after the end of World War 1. It was reported in the SA Division records that Frank travelled from Murray Bridge to Adelaide to personally place his application for membership.

Photo 2: The Early Murray Bridge Radio Club 1922.

Photo 3: 5BF Early Radio Station Equipment at Murray Bridge Frank Miller.

On 14 December 1922, the Murray Bridge Radio Society was formed with 15 members and Frank was the Honorary Secretary. The June 1923 issue of *"The Australian Wireless Review"* reported that he graduated from a crystal set receiver to a one valve receiver and in that year he had been granted a transmitting licence. At that point his transmitter was being planned.

For some years Frank managed a radio and electrical business in the Murray Bridge town. In this business, he serviced radio receivers and actually built broadcast receivers for sale. His shop in the main street had a large cellar under the shop area which was a delight for visiting budding radio experimenters. The cellar housed an array of early model TRF receivers, which were traded in on later superheterodyne models. The old receivers had many beautifully made wide spaced tuning capacitors and large tuning dials, which could be put to good use in those early experimental radio transmitters.

As a radio amateur, he communicated with many other amateurs in Australia and around the world. In the earlier days, it was also a regular feature for listeners in Murray Bridge to tune in to 5BF broadcasting on the Broadcast Band on Sunday morning when regular broadcast stations were not on the air.

Commercial Broadcasting

In 1934, in conjunction with a business partner HW Smith, Frank obtained the commercial Broadcasting Station licence 5MU Murray Bridge. He constructed a 50 watt output transmitter and associated studio control console. The station was erected in a small building on the corner of Eleanor Terrace and Thomas Street, Murray Bridge. The building had two rooms, one which housed the transmitter and the other which formed a studio. At that time, Murray Bridge power supply was DC and a small

Photo 4: 5MU Building & its original 100 ft masts with tuning hut.

attachment at the rear of the building housed a motor/alternator set to provide AC for the transmitter. With the entry to commercial broadcasting, he sold his radio and electrical business.

To provide the aerial system for 5MU, two 30 metre wood masts were erected which supported a 6 metre wide flat top with a vertical section at its centre. The bottom of the vertical section was connected into a tuning hut where the aerial was loaded with inductance against an earth mat. The aerial system was erected with the help of a number of local volunteers.

The station went on the air on 16 September 1934 on 1460 kHz. However sufficient business from local programme support was not adequate to sustain local operation for long. In 1935, the station was purchased by Advertiser Newspapers to become a relay station from Adelaide station 5AD. Frank Miller remained in charge of 5MU until he retired in 1953. Under the ownership of the Advertiser, the 5MU staff, led by Frank, added a linear amplifier to the transmitter which advanced the output power to 200 watts. This was upgraded further to 500 watts in 1954. To make room for the transmitter extensions, the partition between the previous transmitter room and the studio was removed so that the building proper became all transmitter room.

World War 2

When World War 2 commenced in 1939, all amateur radio in Australia was ceased. But Frank was not idle during this period and he set up one of the first two way radios for Emergency Fire Service (EFS) in South Australia. The equipment he made for the Mobilong District Council operated on 2980 kHz.

A base station was installed at the Murray Bridge Council Chambers, powered from the 230 volt D.C. mains. The base station was controlled by Bob Grundy VK5BG, but Frank took charge of the portable unit which was powered by batteries with the high tension supply derived via a vibrator unit. The portable unit was installed in a caravan with an antenna system initially supported by four broom handles at the four corners of the caravan.

The Later Years

Over the years, Frank built numerous units of experimental radio equipment. Apart from his knowledge of radio, he was skilled in fitting and turning and meticulously applied these skills to the construction of his radio equipment. He continuously upgraded his homebuilt equipment.

A QSO recorded in 1937 shows that, at that time, Frank used a two stage transmitter consisting of a 6P6 valve oscillator driving a pair of 807 valves in parallel, which drew an input power of 25 watts. This had superseded an earlier transmitter using a Meissner master oscillator driving a power amplifier. His receiver was a home built eight-valve superheterodyne. A photograph is shown of Frank,

with his station around the 1940s. Frank later obtained a National HRO receiver, probably the first piece of transmitting or receiving equipment for amateur radio, which he had not constructed himself.

Rotatable high gain beams, seen everywhere today where there are radio amateur stations, were not so common in those early years. Frank built a 20 metre rotatable Yagi which was mounted on a timber mast. To change direction, the whole mast section was rotated by a mechanism fitted at ground level. The mechanism was made up from an old milk separator gearbox, working in a reverse sense, and driven by a 1/4 horsepower DC motor. On 80 metres, he used a 134 feet single wire matched impedance antenna.

Powering the transmitter from the DC mains in Murray Bridge was a challenge for the radio amateur. Power was distributed at 460 volts of DC via a three wire system of two outer poles with a neutral at the electrical centre. The outer poles were alternatively connected to successive houses to balance the load. Each house received 230 volts but the connection alternated between a positive outer pole and a negative outer pole. The negative outer pole, 230 volts below the neutral at earth potential, was a bit of a challenge for connecting electron tube circuitry. Another problem was the limitation in plate voltage available. To transmit, using input powers approaching 100 watts, some 600 to 800 volts was normally required at the final amplifier plates. Operation from only 230 volts amounted to a severe restriction in output power. For example, the common 807 transmitting valve needed to be operated at 750 volts to get the maximum power output possible.

Photo 5: Frank Miller with his later amateur radio equipment, (around the 1940s).

Various methods were applied by radio amateurs in Murray Bridge to cope with some of these problems. Frank VK5BF had both mains outer poles wired to his house so that he was able to apply 460 volts to his final amplifier stage. As he had his later transmitter in a large metal rack, he must have gone to a lot of trouble to isolate his negative rails from the metal framework.

AC power replaced the DC system in 1953. Frank's last transmitting system, then AC mains powered, included a rack containing 1000 volt power supplies using 866A rectifiers, a modulator using a pair of 838 valves and an RF unit on 20 metres using a pair of 834 valves as a final stage. The rack was probably redesigned, as the main power modulator unit, from the one shown in the 1940s photograph. An auxiliary rack contained RF units on 40 and 80 metres and one unfinished unit, probably meant for 10 metres. The auxiliary RF units worked in conjunction with the main power-modulator rack.

Frank retired from 5MU in February 1953 and it is assumed that he carried on with his amateur radio activity after retirement. However his retirement period was short-lived, as on 26 April 1954, at the Murray Bridge Soldiers Memorial Hospital, Frank Miller joined the silent keys, age 58 years.

Frank is remembered as one of the early pioneers of experimental radio in Australia.

References

1. 32nd Battalion *http://www.awm.gov.au/units/unit_11219.asp*
2. Battle of Fromelles, France *http://www.abc.net.au/news/specials/fromelles-fallen/*
3. Battle of Polygon Wood *http://en.wikipedia.org/wiki/Battle_of_Polygon_Wood*
4. A History of Radio in South Australia 1897 -1977" by John F. Ross, Sections 2 and 3
5. The Murray Bridge Amateur Radio Story by Lloyd Butler VK5BR - published in *Amateur Radio*, July 1988. Also: *http://users.tpg.com.au/users/ldbutler/MBridge.htm*

VHF/UHF - An Expanding World

David Smith VK3HZ
e *vk3hz@wia.org.au*

Weak Signal

The summer propagation period ended with a bit of a fizzer. March, which can be a hot period in the south of the country, was actually quite mild and propagation followed the same trend.

Overall, the conditions this summer were fairly unspectacular. There were a number of tropo openings across the usual paths from VK3 to VK6 and from VK2/4 to ZL but none of the extended or "huge" openings of a few years ago. For Sporadic E, there were a few openings, unlike last year's almost total drought.

A highlight of the season would have to be the new 10 GHz World Record set by Rex VK7MO and Derek VK6DZ. A lot of effort was put into the preparation and planning for that contact over a number of years. Conditions at the time were exceptional, but not one-off, showing that, with the right equipment, operators, location and timing, great contacts are possible. Of note, the VK to ZL path is yet to be crossed on the higher microwave bands, but I believe it is only a matter of time (and all the other factors!)

The John Moyle Field Day was held in late March. The weather in the south was good and a number of VHF/UHF operators participated. For their efforts, some of them were rewarded with mildly enhanced conditions from VK5 into VK1 and VK2. Andrew VK1DA/P on Mt Ginini managed to work Peter VK5PJ on 23 cm. On 70 cm, a number of contacts were made from the Adelaide area into Canberra. The VK5 to VK1 path is fairly difficult being over land with a few significant hills in the way.

Guy Fletcher VK2KU - SK

There was sad news during the month that Guy VK2KU has succumbed to a long illness. Guy was a much understated achiever on the VHF/UHF scene. He was active on VHF/UHF during his working career from a location in Sydney, and on his retirement he moved to mid-central NSW where he set up a very capable EME station. He recently achieved the 2m EME DXCC. Vale Guy.

Grid Squares Table

One thing that Guy VK2KU was quite passionate about was the Grid Squares League Table that he set up and managed for many years. The table is a tally of grid squares worked for the bands 2 m and up. It is completely honorary – no proof of contacts is required – and is intended as an incentive for people to be active on the VHF/UHF and Microwave bands.

Unfortunately, with Guy's passing, the web site on which the table was hosted has become an orphan – nobody seems to know how to access it and the site administrator doesn't respond to emails.

As a result, I've offered to take over the running of the table. As well, I've proposed that it be renamed to the Guy Fletcher Grid squares Table. To overcome the web site problem, I have moved the pages to: *www.vk3hz.net/gridsquares*

The table is updated 3 times per year – the next being in mid-April, before this column appears. If you are interested in participating, register on one or both of the following email reflectors:

- VK-VHF: *https://lists.ozlabs.org/listinfo/vk-vhf*
-VK-Microwave: *https://groups.yahoo.com/neo/groups/VK-Microwave/info*

and you will receive notification of the next update.

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

Digital DX Modes

Rex Moncur VK7MO

New Version of WSJT for Microwave Tropo-ducting

10 GHz tests between VK6DZ, VK5KK, VK5DK and VK7MO have shown that on tropo-ducting as opposed to tropo-scatter there is little if any spreading of the signal but ducting does come with rapid QSB of up to 20 dB over just a second or so. To date we have been using JT4f which copes well with the spreading that is typical of tropo-scatter but have now concluded that JT65a might be a better mode for tropo-ducting as it has around 2 dB better sensitivity on un-spread signals and also over twice as much error correction to cope with QSB. A disadvantages of previous versions of WSJT for JT65 is that they did not provide

the integrated single tone "Yellow" graph which has proved to be useful for identifying weak evidence of propagation from 1270 Hz single tones and also for completing marginal QSOs using single tone RRR (1500 Hz) and 73 (1700 Hz). Joe Taylor, K1JT, has responded to our suggestions and produced a new version of WSJT10, r5046, with a number of improvements.

- The «Yellow» graph can now be implemented for all modes including JT65 by going to «Setup», «Plot average spectrum (yellow)». To use single tones for 1270 Hz (tune), 1500 Hz (RRR), and 1700 Hz (73) it is necessary to first set these up by going to «Setup», «Options» and changing the messages in Tx4 to TX6 to @1500, @1700 and @1270.
- The «Yellow» tag associated with the «Yellow» graph has been changed to read «frequency» rather than «frequency difference» so it can now be used to directly identify the single tones. (Note: the Red ticks on the waterfall provided with JT4f for reading single tones are not yet implemented of JT65 so it is necessary to use the Yellow tag method)
- A bug that gave an error of 0.75 seconds DT on JT65 has been fixed.
- A bug with JT4 that caused it to send OOO as well RRR and 73 when using the long-form format has been fixed
- A bug that caused JT4 to revert to the long-form format after sending double clicking on the other stations callsign to pick up the signal report has been fixed.

Note: Long-form format provides for sending both call signs and RRR or 73 where-as short-form format gives single tones for both RRR and 73 which are 6 to 8 dB easier to detect on the "Yellow" spectrum graph but must be read by eye. The short-form format is recommended for marginal EME and terrestrial operations on both 10 and 24 GHz.

The new version of WSJT10 r5046 is available on K1JT's web site at: *http://www.physics.princeton.edu/pulsar/K1JT/wsjt.html*

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

Meteor Scatter

Dr Kevin Johnston VK4UH

Normally the summer period, following the Christmas and New Year holidays, is associated with the best of the year's conditions for tropospheric, Sporadic E (Es) and Meteor Scatter (M/S) propagation on 2 m. We have been disappointed by all three this year. In general the weekend Meteor Scatter activity periods have been well populated by stations across VK1 to 5 and 7. There have even been some new calls appearing including VK2EMA (QF37qs), VK3DUT (QF32vf) VK2IUW (QF56if) and VK1DJA (QF44mr), which is great to see. Most stations however reported M/S conditions as being poor to average at best over this period. The number of random meteors has been lower than expected and most pings have been both shorter and weaker than hoped for. The number of hyper-dense "Burns" lasting more than 10 seconds has been low. Conditions have also deteriorated rapidly after dawn, which is a problem at this time of year as the sessions are probably starting too late in the day to take full advantage of what meteors there are. Further there have been no major Meteor Shower events since the Geminid Shower last December. From VK4 I have felt lucky to complete with even 2-3 stations during each session, indeed on some occasions I have failed to complete with any. Stations further south appeared to be having better luck than I but still well below previous year's conditions.

Since 2 m meteor scatter conditions have been disappointing, during the weekend sessions this month, a number of operators have been QSY'ing to 50 MHz at the completion of the normal 2 m sessions. From 21:00 UTC onwards, activity has been occurring on 50.230 FSK441. Active stations over the month have included VK1DJA, VK2BLS, VK2EMA, VK2IUW, VK3HY, VK3DUT, VK3AMZ, VK3II, VK3AXF, VK4UH, VK4CZ, VK4NE, VK4JMC, VK5RM, VK5PJ, VK7JG and VK7XX.

Although I have completed a small number of MS QSOs on 50 MHz in the past, a number of interesting differences are apparent when a large number of stations are on air at this time. As has been well discussed in previous articles, 50 MHz pings are much stronger and of much longer duration than their 144 MHz equivalents. More importantly the period of "useful" meteor activity continues for much longer after the pre-dawn peak on 50 MHz as compared to on 144 MHz. Useful Meteor Scatter propagation is still present long after 2 m has dried up.

The long 50 MHz pings however can be a mixed blessing. WSJT/FSK441 does sometimes fail to decode effectively where the signal returns continue for many seconds or tens of seconds. This is well recognised if for example decodes are attempted on FSK signals from local stations or arriving via propagation other than meteor scatter. It is apparent however that MSRX, the alternative receive-only software, decodes very well indeed under these conditions. I have strongly recommended having MSRX running in the background behind WSJT for serious MS operation and am now even more convinced of its usefulness for operation on 50 MHz where the received pings are so prolonged and often coming from multiple sources in the same frame.

The next major Meteor showers this year include:

LYRIDS

Class 1, Peak expected on or around 23 April 2015 ZHR 15-90/hour

Eta AQUARIDS
Class 1, Peak expected 6 May 2015
ZHR 70/hour

Thanks to all who have provided positive feedback on my recent "Getting Started" articles. It was particularly gratifying to hear from operators who have successfully completed their first M/S QSOs as a result. As spotted by some eagle-eyed readers a typo unfortunately crept into the "Surviving your first M/S contact" article. That's code of course for my having made a mistake.

In the last steps of the stylised MS contact the stations and call signs were inadvertently reversed and I apologise for any confusion caused. The paragraph on *AR* March 2015 P45 should read:

VK4UH/RRR VK1ABC

The same format confirms who is transmitting. "RRR" (Roger Roger Roger) indicates that all required information has been exchanged i.e. both call signs and reports in both directions. When the RRR string is decoded by VK4UH the QSO is actually complete. However VK1ABC cannot know that and would keep on transmitting the same RRR report. Once RRR is received by VK4UH he would then, as a courtesy, change his string to:

VK1ABC/73 VK4UH

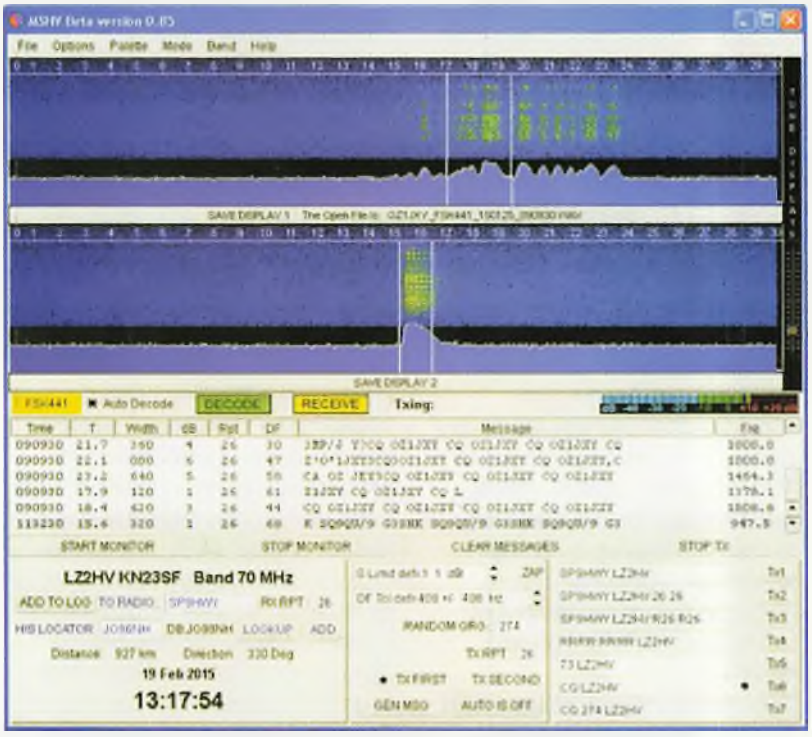
When VK1ABC sees his 73 report he would then go back to CQ or to call another station.

New Software available

There has been some new Meteor Scatter software applications released this month.

A beta version of MSHV is available for download (MSHV Beta Ver. 0.86) at *http://www.lz2hv.host.sk*

Developed by Christo LZ2HV, MSHV is specifically tailored to Meteor Scatter operation and supports JTMS, FSK441, ISCAT and JT6M modes. The software is free to the amateur community and successful installed here with the minimum of heartache. The user manual is available from the same site and downloading this is recommended. Christo has based the programme around K1JT's open source software and added a very functional Graphical User Interface (GUI).



A screen shot of the new software package MSHV by Christo LZ2HV.

I have started using the application in parallel with WSJT and MSRX during the weekend activity sessions and will report more information when operating conditions improve sufficiently to make a valid comparison at least with FSK441. First impressions are favourable however, the software is easy to use and the GUI is appealing. The pre-populated Tx windows are however set up for European/US operating formats but can be easily changed to the usual VK/ZL format without trouble. The ST (Short Text) format is not however supported in this beta version. I have been in contact with Christo LZ2HV who is amenable to suggested changes and is open to all feedback.

Being fully compatible with WSJT, MSHV also writes .wav files containing all the received audio at the end of each receive period, which can be read by MRSX for second-look decoding as described last month.

There has also been a new revision of WSJT (WSJT-10 Ver. 5046) released. The new version is mainly to help with 10 and 24 GHz EME and tropo-ducting (see separate item by VK7MO). There have been no changes to M/S modes and I have found the new version to be fully functional.

Please send any reports, questions or enquiries about Meteor Scatter in general or the digital modes used to Kevin VK4UH at *vk4uh@wia.org.au*

VK3 news Amateur Radio Victoria

Jim Linton VK3PC
e *arv@amateurradio.com.au*
w *www.amateurradio.com.au*

The AGM this month

The WIA Victoria - Amateur Radio Victoria annual general meeting will be at 8 pm, in the office at Ashburton on Tuesday 19 May, 2015.

All financial members will now have online access to the annual reports by the President Barry Robinson VK3PV and the Secretary/Treasurer Ross Pittard VK3CE.

These will be explained at the AGM, which looks at the performance and activity of the state-wide organisation.

Apart from being a further opportunity for members to ask questions of office-bearers and make suggestions or comments, it provides a social occasion, with refreshments served.

Interactive VK3RCW beacon

Amateur Radio Victoria's Morse code beacon VK3RCW is being used by radio amateurs to increase their speed allowing them to join the CW mode on the bands.

This interactive beacon is at Waverley in Melbourne's east. On 145.650 MHz and operating 24/7 the VK3RCW beacon invites access to its menu via DTMF codes on 433.050 MHz.

Well how does it work? Built by David Byrne VK3DRB using his expertise with things digital, it has wide coverage and features the well-known voice talent of Jane Holmes.

Using DTMF codes via the control input of 433.05 MHz, you press 1 to select the menu, 2 to change speed, 3 for the tone of emission (400 - 600 - 800 Hz), and 5 to read back the text.

The DTMF tones can be generated using a DTMF microphone, mobile phone or be computer generated, with a microphone held in front of a loud speaker.

In a clear voice Jane will ask a user to 'hold the line' and this is where you need to listen for the result on the VK3RCW output frequency of 145.650 MHz.

Volunteer wanted for secretarial duties

A fully secure online membership database has been created enabling its maintenance to be done remotely, and we are looking for a capable person to look after it.

Using this database the Membership/Minute Secretary needs to liaise with the Secretary and the Online Internet Project Manager, to ensure the online database is updated with callsign changes and new members.

Other duties include the follow-up of incorrect email addresses and check with expired members as to why they are not renewing. Some manual renewals and letters to about 30 members (over a two-year period) who do not have a valid email address.

Taking the minutes and reporting of activities requires attendance at about five meetings of Council and the Annual General Meeting each year.

If you want to know more about the job of Membership/Minute Secretary, then please contact the Secretary Ross Pittard VK3CE at *vk3ce@amateurradio.com.au*

Online secure payments

The popular way to pay your two-year membership, for operating award claims or make available purchases, is to use the 'shop' facility on our website.

Membership of the state-wide organisation is affordable to most at less than 5 cents a day. It helps fund a number of services including being a public interface, education of new radio amateurs, a modern mobile-friendly website, Inwards QSL Bureau, and the repeater and beacon network.

It costs a mere $30 for two years, or $25 concession. The subscription level has not gone up for many years. Join or re-join today.

Over to you

WIA Survey analysis

Dear Peter,

I read with interest Chris Platt VK5CP's article in the March 2015 *AR* titled "Further Analysis of the 2014 WIA Survey".

There is one important question here that is not being asked nor addressed… And the question is "Why do 2/3 of Australian amateurs choose NOT to be members of the WIA"?

I am sure that once the Board looks introspectively into this question that courses of action will become obvious.

Regards,

Stephen Ireland VK3VM / VK3SIR

Assessor 3-072

SOTA News

Allen Harvie VK3HRA

March turned out to be a challenging month for SOTA – not due to lack of activity or harsh weather but due to an increase in portable activities leading to competition for bandwidth.

The Labour Day long weekend was selected for hosting a SOTA party and several activators took advantage of the mild weather and the extended weekend to complete multi day/summit expeditions.

Warren VK3BYD, Wayne VK3WAM and Allen VK3HRA spent three nights deep in the Viking Wilderness Area following the Australian Alpine Walking Track (AAWT) to activate five remote summits over three days. CW played a major role in these activations and equipment was shared to reduce weight. See:

https://vk3hra.wordpress.com/2015/03/10/09032015-vk3ve-103-vk3ve-022-vk3ve-043-vk3ve-044-vk3ve-037-and-vk3ve-027/

VK2BJP Russ, VK2QR Rob and VK2TWR Rod teamed up and activated 11 VK3 and VK2 high country summits between them over two days.

VK1NAM Andrew spent four days activating SOTA in the Snowy Mountains (Kosciuszko National Park) picking up seven summits over 54 km of walking.

https://vk1nam.wordpress.com/2015/03/09/sota-kosciuszko-national-park/

https://vk1nam.wordpress.com/2015/04/05/sota-the-chimneys-kosciuszko-national-park/

Expeditions were not limited to the long weekend: Glenn VK3YY, Kevin VK3KAB and Jody VK3FJAT delivered six Alpine summits in a day. The story can be found here:

https://vk3yy.wordpress.com/2015/03/04/six-summits-in-the-victorian-high-country/

Activations were not limited to the mainland Australia, with VK7AN Allen activating SOTA peak VK9/NO-001 Mt Bates within WWFF VKFF-392 – Norfolk Island, understandably very popular with chasers.

SOTA faces competition for 40 m

Competition for 40 m this month came from an increase in the number of listed World Wide Fauna and Flora (WWFF) park activations as well as the annual John Moyle Memorial Field Day (JMMFD) weekend and it appeared everyone was out calling CQ/p.

WWFF is an international amateur radio program with the 'Australia Flora and Fauna in

Left to right: Allen VK3HRA, Warren VK3BYD and Wayne VK3WAM on VK3/VE-037 The Viking with VK3/VE-044 The Razor to the right and VK3/VE-027 Mt Cobbler in the background. Photo by Warren Brown VK3BYD.

amateur radio' (VKFF) an authorised partner. In March 2013, the WWFF program commenced in VK with 706 parks listed. You would think that 706 would be enough but park activation was enthusiastically embraced and it did not take long for questions to be asked as to why some parks were not listed in the program. The good news was that the program supports adding additional parks to an association once a threshold of activity for the previously listed parks has been reached. In March 2015, the local coordinator Paul VK5PAS requested that an additional 57 South Australian Conservation Parks, 26 Victorian State and seven Victorian Coastal parks be added to the WWFF VK schedule and with the high level of park activity in VK, the requirements for adding additional parks was easily met. The process was quick with the result being an increase to 796 Parks valid for activation.

Several of the new Parks are in areas with easier access then typically the case for remote National Parks. The new Parks listed were either State or Regional Parks that are not currently covered by the popular VK3 Keith Roget Memorial National Parks Award (KRMNPA), but include several that are part of the VK5 National and Conservation Parks Award (SANPCPA). The inclusion of all types has expanded the opportunities for activators.

SOTA and Park activations are complementary with the majority of activators participating in both. Careful planning will allow operators to combine SOTA peaks within defined Parks thus increasing the pool of potential chasers.

Whilst the nature of SOTA activations is typically QRP exploiting small lightweight devices and possibly compromised antenna, Park activations support the use of higher-powered radios and more extensive antennas. In addition, the ability to setup in a protected position not within the Activation Zone on the top of a summit supports extended activations.

It is worth noting that whilst 44 contacts are required to qualify the park for WWFF awards, the VKFF program only requires 10 QSOs and in both cases the contacts can be accrued over multiple activations. This is greater than the four unique contacts required for a SOTA activation to accrue Activator points. For the VKFF and WWFF programs, only the Activator needs to submit his/her log to the local coordinator (Paul VK5PAS). The Hunter's Parks tally is automatically compiled within the database. It is simple to register for WWFF – you may find that you have already qualified for one or more awards. For more information, see the WWFF Australia website: *http://www.wwffaustralia.com/*

Any SOTA Activator out there who has operated from a National Park should check to see if that Park has a VKFF identifier. If so, please consider collating your log in the required format and submit it to Paul for upload to the database.

The combining of SOTA peaks with WWFF Parks will benefit the SOTA operator as opportunities for DX contacts with European Park hunters will increase, as overseas Hunters are keen to get some of these new VKFF references in their logs.

So be you a Goat, Sloth, Activator, Hunter or Chaser, portable activities have opportunities for all.

SOTA database trivia

The Manager of the SOTA database recently made the following observation on the SOTA Reflector:

The one millionth SSB QSO logged was this one:
28/March/2015 at 02:06Z between VK2IB/3 on summit VK3/VE-064 (VK3/VE-064) with VK3PF on 7MHz SSB.
There is possibly the fact that the one millionth QSO logged was not the same as the one millionth QSO depending on who logged what. Finding it out is a little more involved.

Well done Bernard and Peter!
Anyway, off to practice CW...
Allen VK3HRA

VK0JJJ/mobile marine aboard the ice breaker Aurora Australis

Craig Hayhow VK6JJJ

After spending 419 days on the continent, finally it was time to come home. The sea ice had refused to break out and the ice breaker "Aurora Australis", after trying for several weeks had to abandon its first attempt to extract us. Leaving us packed and ready to mobilize, the Aurora returned to Hobart to bring back helicopters to attempt a rare flying resupply.

On 31st March 2014, the day after a huge blizzard, the sky cleared to a beautiful sunny yet bitterly cold -24°C day. The helicopters were cleared of snow and prepared for flight and around 11 am I climbed aboard for the spectacular long flight out to the Aurora Australis that was locked tight in a sea of ice from horizon to horizon.

It was really a strange sight form the beautiful surroundings I had been accustomed to for the past year, but it had a stark beauty of its own coloured with pastel hues with brilliant green auroral displays overhead.

I wasted no time setting up my station there after the comms room became my radio shack for the long rough trip home back to Hobart.

Photo 1: MV Aurora Australis making slow progress through the ice pack.

Photo 2: A view of the Aurora Australis as the ship breaks through the ice at night.

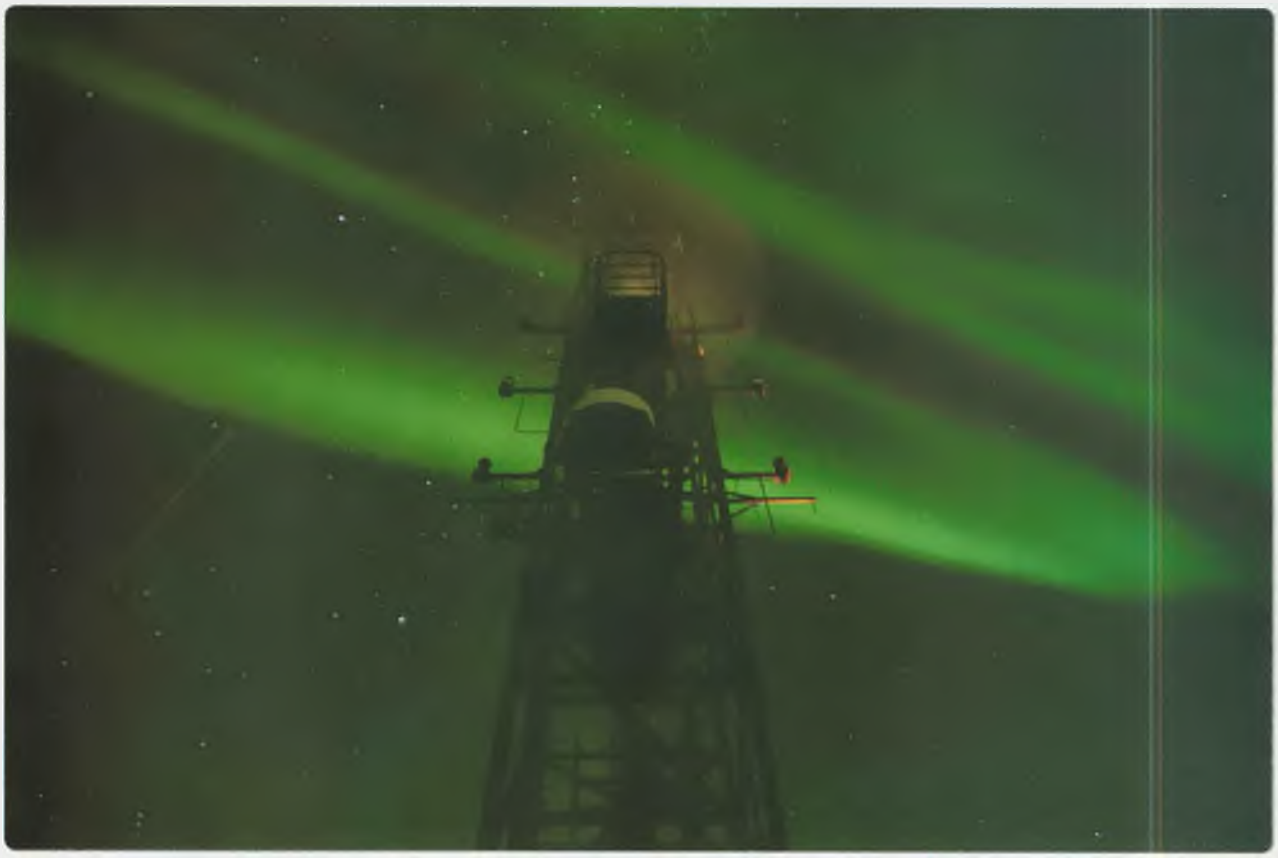
Photo 3: Helicopter lift operations from MV Aurora Australis.

My antenna was to be a 5.5 metre Moonraker vertical and auto tuner mounted on the hand rail above the bridge. When I fired up the Flex 5000 I was shocked at all the man-made noise on the bands, I had really been spoilt with the zero noise in Antarctica.

I know I certainly wasn't the first amateur radio station on-board the Aurora Australis, but I still think it's probably a pretty rare event so I got to work to give out as many contacts as I could. Right away I noticed completely different propagation to what I was accustomed to at Mawson. Early mornings and late at night I worked the low bands while throughout the day I worked the 10 metre band.

I had to work a lot harder now without my 100 x 80 metre Sloping Triangle antenna and amplifier I was using at Mawson, but I did have the best ground plane possible and when the bands were open the vertical put out a very respectable signal. When I wasn't involved in resupply and helicopter duties, I was behind the microphone having

Photo 4: Another view of the Aurora Australis.



hundreds of QSOs to stations all over the world but giving priority to my VK/ZL colleagues.

After seven days of hectic flying activities to resupply Mawson with the minimum supplies to get them through winter, on 7th April with an air temperature of -24°C, the Aurora Australis fired up both engines and began the arduous process of trying to smash its way out of this frozen hell. Being so late in the season and only six weeks after rescuing a stranded Russian ship, the Aurora Australis was in grave danger herself of being stranded and having to spend the whole winter locked in an icy grave (with me on-board).

The struggle between ice and ship was relentless. Back and forwards at full power twenty four hours a day. The sound of ice scraping on the hull, screaming engines and sudden shudders creaking and groaning persisted for four days until finally we started to make some progress. The old orange roughy had out smarted mother nature once again, but her aging hull had some serious new battle scars to show for the effort.

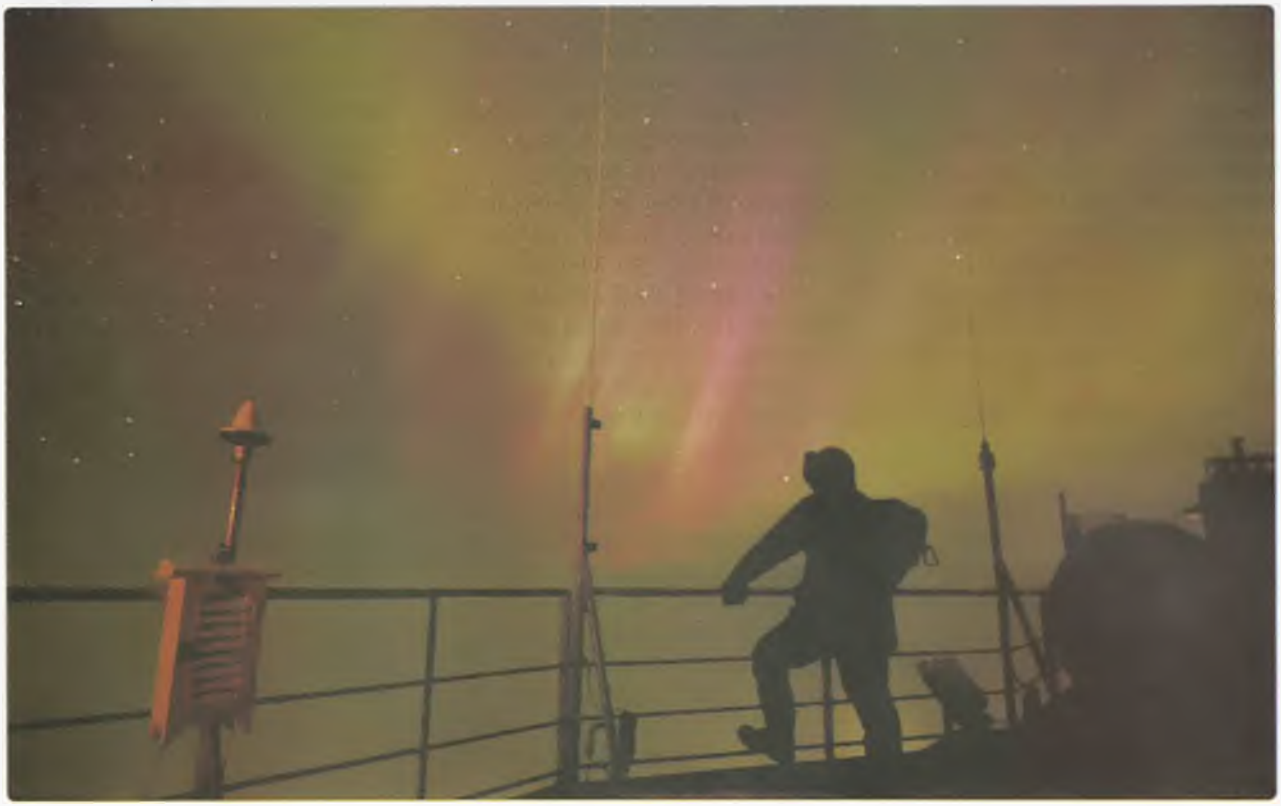
Over the next few days my "On Air" time reduced as I took in the beautiful scenery and fantastic wildlife as we smashed our way back out through the thinning sea ice towards the open wild Southern Ocean. As huge thick plates of ice cracked and rolled over or exploded into fragments, penguins, seals and Minke whales watched on as we glided by leaving a trail of destruction with brilliant green auroral displays overhead.

Noise from the ship was now making life on the lower bands very difficult but propagation on 10 m was very good, so I focused on this band most of the time. Many stations back in Australia were following my progress and we spoke every day. Once we reached the open ocean, the wild Southern Ocean threw everything she had at us and immediately I had to tie my station down and hang on for dear life as any unsecured item became a projectile and tumbled around the floor.

Life became hell for many who became too sick to leave their cabins but the up side was the rising temperature outside. I continued to operate the radio day and night using a headset so I could hang on with both hands. As we slowly made progress on the 5475 kilometre voyage back to Hobart, skip distances changed and the low bands became less usable and so I then focused all my attention on 10m for the rest of the journey.

My final transmission from the Aurora Australis was on the 19th April as we sailed in the relative calm of Tasmania's beautiful southern coastline. Smelling the trees in the far distance was an unforgettable experience. My journey had come to an end as I packed up my station and prepared to disembark and reintegrate back into the real world. Once again VNAA Aurora Australis fell silent until the next time she is activated.

Photo 5: An expeditioner watches the Aurora Australis display.



VK2 news

Tim Mills VK2ZTM
e *vk2ztm@wia.org.au*

The 2015 AGM for **Amateur Radio New South Wales** is scheduled for 10 am on Saturday 2nd May at the VK2WI site, 63 Quarry Road, Dural.

Members who plan to attend the AGM and have received the annual reports by email are reminded to down load a copy, if required, and bring it with you on the day. The nominations this year were all from the existing committee members, so no election was required.

The next Foundation course conducted by ARNSW is this month over the weekend of 23rd and 24th May.

All assessment grades are available on the Sunday.

Make a booking by an email to *education@arnsw.org.au* There is an attendance limit that can be handled with both the course and assessments. Over the same weekend, the **Waverley ARS** will have a Foundation course and assessments. Make a booking with them by an email to *education@vk2bv.org* The annual Waverley auction is scheduled for Saturday 4th July. The Blue Mountains upgrade course is well under way at the Glenbrook club rooms on Wednesday evenings: *www.bmarc.org*

The next **ARNSW Trash & Treasure** is on the last Sunday of May, the 31st. A note to those who wish to apply for disposal items featured on the ARNSW web site. Read the instructions carefully and note that any inquiry is only accepted by email. The Disposal section is unable to accept telephone inquiries.

The ARNSW March Field Day on various data modes was well attended. The next will be on Sunday 28th June. The topics are still being determined. Last year there was a successful event when the topic was baluns. ARNSW members are still able to apply for balun kits and Kevlar wire. Email your order to *balun@arnsw.org.au*

A month to go until the **Oxley Region ARC** Field Day over Saturday 6th and Sunday 7th June, the Queen's Birthday long weekend. There is a change of venue for this year while the Surf Club is being renovated. This year it's at the Hastings Public School which is on the corner of Woniora Parkway and Hillcrest Avenue, Port Macquarie. The Saturday evening dinner, as usual, is at the Tacking Point Golf Club which is at the southern end of town. VK2WI News will have more details and reminders throughout this month.

WICEN NSW is surveying on 3rd May for this year's Navshield with the event scheduled over the weekend of 4th and 5th July. Hunter WICEN is looking for new members, contact Barry VK2BZ. Westlake's ARC will have their AGM on Saturday 2nd May at 1.30 pm at the Teralba club rooms and a car boot sale is scheduled for 9th May.

The **Hunter Radio Group** held their AGM on 13th March with the following positions for the next year:

Patrons are Norm Stanley VK2BNS and Les Baber VK2RJ.

President is Len Daley VK2ZFD with Rodney Prout VK2CN in the role of Secretary/Treasurer. Repeater Officer is Greg Williams VK2HT and Beacon Officer Grahame O'Brien VK2FA. Contest Officers are Jamie Campbell VK2YCJ and Grahame O'Brien VK2FA. The Broadcast and Web Master is Tony Dodds VK2ABM, Social Secretary Pauline Jones VK2GTB and Events Co-ordinator Len Daley VK2ZFD. The group meets on the second Friday evening at NBN TV Studios from February to November.

In last month's notes there was a report about repeaters for the **Taree & District ARC**. Ross VK2DVZ has supplied further information and the changes that they have made. Recently the Mt Marie repeaters left the expensive site and now all the club's systems reside at Mount Ganghat. Here, under the callsign of VK2REE is 2 metres on 146.675 MHz which requires a 123 Hz tone and will accept both C4FM Digital and conventional FM signals. Currently the output is conventional FM. Also there is the previous 70 cm repeater on 438.325 MHz with the standard 5 MHz offset. The Taree club no longer hold the previous repeater call signs of VK2RET and VK2RRE.

In late March the **Summerland ARC** converted their Lismore repeater VK2RSC on 6800 to a stand-alone solar system. By going "off grid" the Club will save about $1k annually in power and access charges. Last month a meeting was held to elect three new Trustees to the Club.

The **HADARC** group recently had a busy time interacting with the public at two displays mounted in the local shopping mall and an open night at their Mt. Colah meeting location.

Also in late March a group of **Batemans Bay** amateurs on the VK2 south coast met to form a local club. Twelve signed on to form the club which will be known at the Batemans Bay Amateur Radio Society advised Stewart Smith VK2HDV. Contact address is PO Box 3150 Batehaven NSW 2536.

If the plans are still in place, Dick Smith VK2DIK will be aeronautical mobile over both the VK5 and VK6 portions of the Nullarbor conducting a survey for a future operation. He will, when practical, operate on a fixed channel of 14.146 MHz. The operation is between 6th and 15th May.

73 – Tim VK2ZTM.

Spotlight on SWLing

Robin L Harwood VK7RH
e *vk7rh@wia.org.au*

As I reported in my recent column, Deutsche Welle in Cologne ceased transmissions from their Kigali relay station at 2230 UTC on March 29th.

However DW programs continue from Issoudon in France, Madagascar, Ascension Island, Armenia and their former relay base in Trincomallee.

I also noticed that Radio Taiwan International also stopped relaying their European programming via Issoudon, when the transmission agreement between RTI and RFI fell over. I believe that South Korea may still be utilising the RFI sites in Issoudon. Incidentally there is a strike on at domestic Radio France now. Radio France International (RFI) apparently is a separate company. Apparently RFI only broadcasts on HF to Africa now.

You also may recall that I mentioned Global Radio 24 a private commercial shortwave station using WRMI at Okeechobee Florida. It was supposed to be on 9395 24/7 but quickly ran out of puff. Broadcasts ceased in early March and it has resumed now via a small shortwave station believed to be located in Sweden. It is only running a weekly half-hour program and has been occasionally heard via WRMI.

I note that the BBC World Service is using 9410 from 0600 till 0800 UTC. This used to be a regular channel and one of the first shortwave signals that I heard many decades ago. Signals originally came from Daventry as well as other sites. Signals now emanate from near Johannesburg RSA and I am not hearing them because they are wedged in between a strong signal from Athens on 9420 as well as the PKK station in Kurdish on 9400. The RSA signals naturally are beamed northwards.

As you are aware, Cyclone Pam made a huge swathe over Vanuatu, causing severe damage and disrupting communications. Fortunately Radio Australia and Radio New Zealand were on shortwave, as all domestic senders had been damaged and were off-air. Radio Vanuatu usually transmits on 3945 and 7260 to reach the outer islands but also had been silent. Interestingly the BBC World Service also popped up on 11680 for an hour between 1900 and 2000 specifically for Vanuatu via the Kranji senders. Radio Vanuatu is operational now and it is best heard here on 3945. 7260 seems to be better in S.E. Queensland.

73 and good monitoring from Robin VK7RH *vk7rh@wia.org.au*

Over to you

EMAIL RECEIVED 17/3/2015

In the recent March 2015 *AR* there was an article on a great little "simple solder fume exhaust unit" built with items from the junk box. This is a much more elegant and sophisticated exhaust unit than the one I discovered when I was sorting through the collection of electronics gear in a deceased estate.

At least that's what I think it was intended to do.

You can see from the attached photos that it could be called "an even simpler solder fume exhaust unit"... It's basically a 240 V cooling fan with a power cord attached. I have sent in the pics because it might give someone a smile. It is earthed and all the connections are well covered but you would definitely choose the one described in the March *AR*.

Thank you for the magazine.

73,

Andrew Mason

VK4NDY

VK3 news Geelong Amateur Radio Club

Tony Collis VK3JGC

NASA's JPL, Moonshine and The GARC

Late in February, notification was posted to the VK-VHF email list advising that NASA's Jet Propulsion Labs (JPL) would be conducting an experiment involving a microwave radio transmission in the 2 GHz band beamed at the moon. JPL would be utilising the 34 metre dish at their Goldstone Deep Space Communications Complex in the Mojave Desert in California.

The Goldstone antennas are normally operational 24 hours a day bringing in data from missions to the outer limits of our solar system and have a receive sensitivity of ***one billionth of one billionth of a watt.***

However for this project, the dish would be used to beam at the moon a 20 kW carrier power signal (not the Effective Isotropic Radiated Power) at the designated frequency of 2.115 GHz . The test (Test # 1) was scheduled for the evening of Tuesday 3rd March (AEST) when the moon would be above our horizon for most of the proposed transmission period.

With only a couple of days lead time before the event Chas VK3PY, David VK3QM and Bert VK3TU put together a plan to take advantage of the opportunity offered them to monitor the Earth Moon Earth (EME) transmission.

Two problems identified were firstly that the designated frequency of 2.115 GHz was outside the capability of their microwave transverters but Bert VK3TU was able to access a suitable spectrum analyser which proved to be a far better solution. The second issue was that they had to design and build a low noise amplifier chain to bring the system noise figure down to an acceptable level. This latter activity was completed on the Sunday preceding the transmission.

The main receiving antenna was to be the 1.2 m diameter dish they normally use on field days on the 2.4 GHz and 3.4 GHz bands when operating as VK3UHF. They also took along a 60 cm dish for comparison and Ken VK3AKK also

Figure 1: The Goldstone 34 m dish (Courtesy of NASA/JPL-Caltech).

made available his grid pack dish for further comparison.

Tuesday 3rd March - EME Day

All four members of the GARC team gathered at the agreed location at Lovely Banks after work at around 5:30 p.m., giving them plenty of time to set up the equipment prior to moon rise at 6:27 p.m. An issue that they had not been aware of, until on site, was the high noise level that inhabits the 2 GHz spectrum that necessitated some extra filtering and careful adjustment of antenna polarisation to reduce it to an acceptable level.

With the moon just poking above the horizon, at the appointed time, the signal from JPL appeared. With some adjustments to the antenna pointing and the spectrum analyser settings, they recorded the EME signal at the predicted frequency. Figure 2 is a screen shot from the spectrum analyser displaying the received signal. They continued to monitor the EME transmission as the moon moved across the sky until JPL switched it off at precisely 0900 UTC.

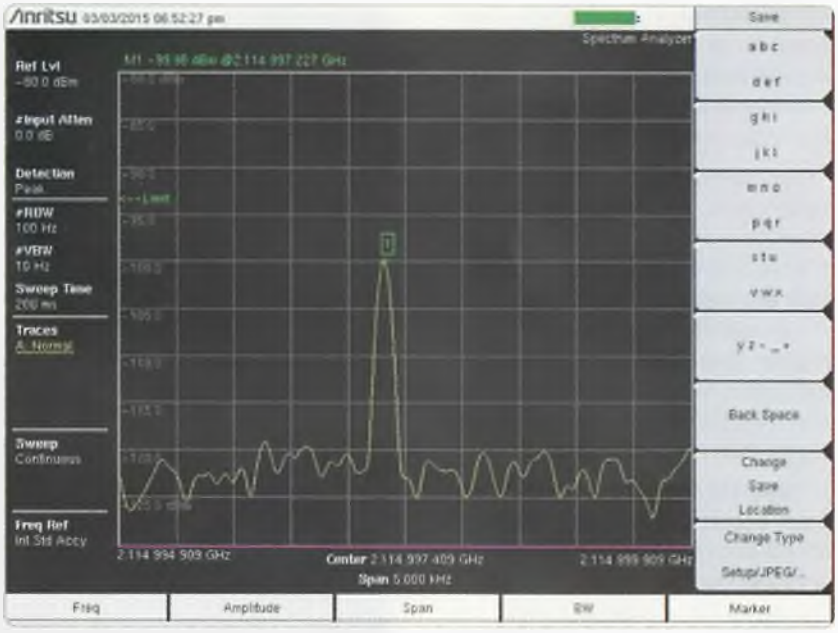
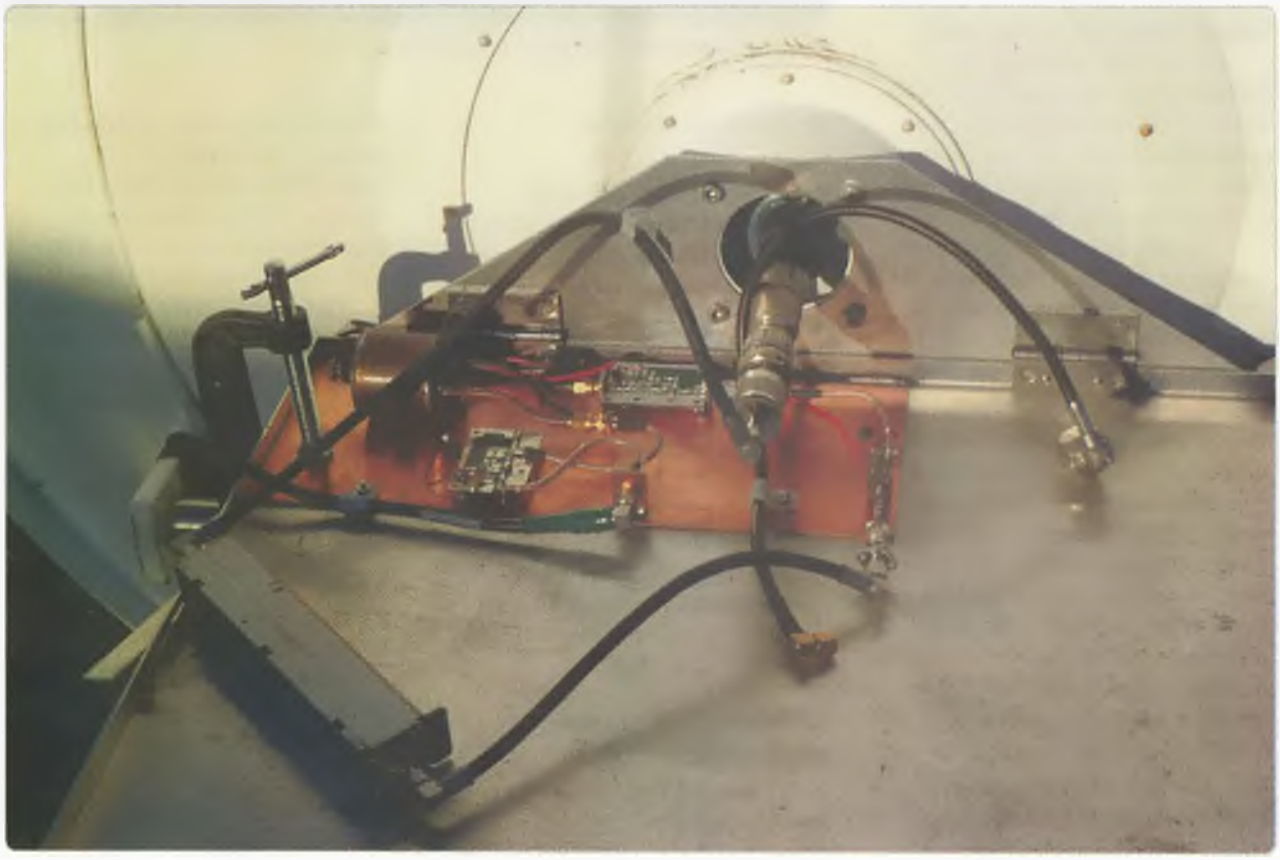


Figure 2: Spectrum Analyser EME Signal Detection.

To have achieved this in such a short time line was nothing short of remarkable and the success was further embellished after exchanging

Figure 3: The feed to the 1.2 m dish showing the low noise preamplifier.



e-mails with Jim Lux W6RMK (The engineer at JPL involved in the experiment) who replied with these comments after Chas VK3PY sent him their results:

"Your measurements were actually quite useful, because in these situations, you never are sure they're are radiating what you think they are supposed to be radiating. It's an experimental operation, not a regular spacecraft communication link that is all nice and scripted and bullet proof and you saw more signal than we did."

In regard to the latter comment the team copied JPL's transmission 20 dB above their noise floor in a 100Hz bandwidth. JPL copied the signal 10 - 15 dB in a 1 Hz bandwidth. Therefore correcting for their narrower bandwidth the GARC members signal to Noise ratio was 25 dB better than JPL's. In simple terms that represents 4-5 S units or 300 times better! Taking into account the limited time available to assemble all the equipment and get it up and running the whole exercise was an outstanding achievement.

Jim W4RMK remarked *"in a 1 Hz bandwidth we should have been about 35 dB above the noise floor (we were not and I am running that down). Our receiver is not very hot, 4 - 5 dB Noise Figure."*

As it transpired the GARC team had better reception than the NASA JPL team which gave rise to another input from a JPL engineer.

"Jim forwarded your (VK3PY) e-mail and your "Moonshine" observations. Very nice measurement.... I am glad to hear you saw the signal until 9:00 p.m. UTC. Since after 8:30'ish we could not see the signal at JPL on the scope. Although there is a chance that Jim will be able to extract the signal in post analysis. With your permission I would like to show your pictures in my Management Report. Having collaborators such as yourself is always great PR."

This was as a consequence of Jim W6RMK forwarding Chuck the GARC observations. Subsequently

Figure 4: The On-site Set Up at Lovely Banks.

Jim made the following observations to Chuck:

"We need a better spectrum analyser next time. The GARC team was using a newer Anritsu... note they were using a 100 Hz bandwidth (so covering the Doppler spread), with 200 ms sweep time, so you would be able to see it move. Jim Lux"

It is of interest to note that from JPL's engineer's point of view the GARC has access to better equipment than NASA's Jet Propulsion Laboratory!

The above was adapted from information provided to the GARC Forum by Chas VK3PY.

Confirmation of new microwave records

In the January/February edition of the *AR* magazine, the GARC VK3 column all the achievements of the VK3UHF team were identified as *subject to confirmation*.

Chas VK3PY now confirms that the Lara UHF and Microwave Experimenters Group, (LUMEG) comprising Chas VK3PY, David VK3QM, Ken VK3NW and Charlie VK3NX can now add the following distance records to their established VK5 and VK7 microwave records:

VK1

3.4 GHz, 5.7 GHz and 10 GHz bands at 501.3 km.

VK2

2.4 GHz, 3.4 GHz and 5.7 GHz bands at 501.2 km.

These are bi-directional awards as David VK3QM travelled to *'the other end'* to establish the communication path on behalf of LUMEG.

Contests

James Fleming VK4TJF/K8UP
e *vk4tjf@wia.org.au*

There are two great contests that happen in this month - one Australian and one international. One in the beginning and one at the end of the month: One that has a QRP category and many other categories including overlay categories and one that has very simple rules. One with many bands and one with just one band.

The main contest this month of May to get involved in is the Harry Angel contest. The date is 2nd May 2015 from 1000 - 1146 Z. At 106 minutes it is not a very long contest and should well suited for those just starting out in contesting. The contest first started in 1999 to celebrate the life of Harry Angel VK4HA who at the time of his death (106 years old) was the oldest amateur radio operator in Australia. It is strictly an 80 metre contest, so no need to work out any band plans. You can either do phone, CW, or mixed mode. Each contact is worth one point on phone and two points on CW. The focus here is to work as many stations as possible without regard to DX. There is no category based on power output. The VKCL logging program is the logging program to use for any Australian contest. Please submit your log in Cabrillo format to: *harryangel@redclifferadioclub.org.au*

Also in May is the CQ WW WPX contest CW on the 30th and 31st starting on 0000 Z Saturday and ending on 2359 Sunday. Single ops may operate 36 of the 48 hours and off times must be at least 60 minutes. Multi-ops may operate the whole 48 hours. Bands are HF and all except for the WARC bands. Exchange is RST and progressive serial number. The score is the result of the total QSO points multiplied by the number of different prefixes worked. A station may be worked once on each band for a QSO point. Contacts between different stations on different continents are worth 3 points on 28, 21, and 14 MHz and six points on 7, 3.5 and 1.8 MHz. Contacts between stations in the same country are worth 1 point. The prefix multiplier is the number of valid prefixes worked. Each prefix is only counted once. You can enter as single operator or single operator assisted – using high, low or QRP power. There is also overlay categories, tri-bander/ single element or rookie. There are also multi-operator categories all-band only. Single transmitter multi-op has high and low power. Multi-two transmitter and Multi-unlimited transmitter where there is only high power category. Please submit your log in Cabrillo format to *http://www.cqwpx.com/logcheck/*

73s and good luck in the contests,

James Fleming VK4TJF/K8UP

Contest Calendar for May 2015 - July 2015

Month	Date	Starts at	Spans	Name	Mode
May	2nd	1000 Z	106 min	Harry Angel Memorial 80 m sprint	Phone/CW/Mixed
	2nd – 3rd	1200 Z	24 hours	ARI International DX contest	CW/SSB/RTTY
	9th - 10th	1200 Z	24 hours	Volta WW RTTY contest	RTTY
	9th - 10th	1200 Z	24 hours	CQ-M International DX contest	CW/SSB
	23rd - 24th	1200 Z	24 hours	EU PSK DX contest	PSK63
	30th – 31st	0000 Z	48 hours	CQ WW WPX contest	CW
June	**6th - 7th**	**0600 Z**	**24 hours**	**VK Shires contest**	**CW/SSB**
	13th - 14th	1200 Z	24 hours	Portugal Day contest	CW/SSB
	20th – 21st	**0100 Z**	**24 hours**	**Winter VHF/UHF Field Day**	**CW/SSB**
	20th – 21st	0000 Z	48 hours	All Asian DX contest	CW
	27th - 28th	1200 Z	24 hours	Ukrainian DX Digi contest	RTTY/PSK63
July	4th - 5th	1100 Z	24 hours	DL-DX RTTY contest	RTTY
	11th - 12th	1200 Z	24 hours	IARU HF World Championship	CW/SSB
	18th - 19th	1200 Z	24 hours	DMC RTTY contest	RTTY
	25th - 26th	1200 Z	24 hours	RSGB IOTA contest	CW/SSB

Participate

Winter VHF/UHF Field Day 20-21 June

VHF-UHF Field Days and the challenge of change

Roger Harrison VK2ZRH

"The time has come," the Walrus said, *"To talk of many things . . ."*, starts a verse from author Lewis Carroll's famous novel, *Through the Looking-Glass, and What Alice Found There*.

Some time ago, the WIA Board expressed a desire to see some development in the VHF-UHF Field Day events, in addition to encouraging "the market" to decide on a scoring methodology. As you will recall from the article covering the last two Field Days in the March issue, the market has pretty much decided to have an each-way bet. Subsequently, some feedback has been received and various discussions have been posted on amateur radio online forums.

As a consequence of the past year's experiences, the online discourse and feedback received, the Winter and Spring 2015 events will operate under some changes to the rules. The objective here is to try and attract more people to participate in the Field Days, and to encourage more operators to submit logs. In other words, to reduce the barriers to entering the Field Days – that is the challenge.

Change, hell and handbaskets

There are now four Sections, reduced from six in the previous rules, and four Sub-sections, up from two in the previous rules. Operators can enter a log for *either* 24-hour operations, *or* 8-hour operations. This breaks the nexus between 24-hour and 8-hour operations that prevailed previously, where stations could submit a log for 24-hour operations and select the best 8 hours to submit another log for that. Now, operators need to decide their strategy beforehand for either 24-hour or 8-hour operations. Of course, Murphy and the weather might curtail what was to be your 24-hour operation, in which case you can recover something by submitting a log for 8-hour operations!

The four Sub-sections introduce a new approach, with Single-band, Four-band, All-bands and Digital operations. Not too many people or teams can amass the gear for all-band 'super stations'. For many, that sort of operation is aspirational. Part of the purpose of the four sub-sections is to provide something for newcomers to amateur radio as well Field Day newbies and to cater specifically for Foundation and Standard licensees. Marshalling the requirements for a single-band operation, or perhaps two, three or four bands, is not a daunting task. A founding principle of the Field Days is to go out and have fun, so these categories can provide a taste of that.

Digital modes enjoy considerable popularity among the VHF-UHF-microwave fraternity, particularly for weak-signal working. Providing it as a separate sub-section has been done to highlight this field of amateur experimental operations.

To up the Field Day pace a little, the repeat contact period has been reduced to two hours, from three hours previously.

Note that contacts now require exchanging 6-character (6-char.) locators for all contacts, including for Division 1. However, Division 1 scoring and Rover operations are still based on Squares (4-char. locators).

One last thing – only electronic logs in ASCII text (.txt) format will be accepted from now. Online log uploads proved popular with participants in the Spring 2014 and Summer 2015 events.

Sections

A: Portable station, single operator, 24 hours (A1) OR 8 hours (A2).

B: Portable station, multiple operators, 24 hours (B1) OR 8 hours (B2).

C: Home station, 24 hours (C1) OR 8 hours (C2).

D: Rover station, 24 hours (D1) OR 8 hours (D2).

Note that 8 hours means any period up to 8 hours; i.e. you can submit a log for a few contacts (even just one!). Likewise, 24 hours means any period from 8 hours up to 24 hours.

Subsections

(a **Single-band only**: any single band permitted on the operator's licence.

(b) **Four-bands**: 6 m/2 m/70 cm/23 cm – any two, up to the four – only.

(c) **All-bands:** all bands 50 MHz-up permitted on the operator's licence.

(d) **Digital:** contacts using non-voice digital modes (e.g. FSK441, JT4, JT65, MAP65, PSK31, RTTY, etc) are encouraged for any Section-Subsection, but entries must be submitted in a separate log, scored separately. Operators may submit a log for any other section in addition to their digital log entry.

Stations entering the all-bands sub-section cannot enter additional logs for the four-bands or single-band sub-sections.

General Rules

There are two Divisions: Division 1 scores contacts on the basis of Squares (4-character locator) worked; Division 2 employs distance-based scoring. Operators may enter either Division 1 or Division 2, or both. See the scoring rules below. A Square refers to the Maidenhead Locator system definition – as denoted by the 4-character locator. To facilitate scoring for Division 2, all stations are required to exchange SubSquare locations (i.e. the 6-character locator).

Operating periods: Stations may elect to enter either a 24-hour section or an 8-hour section, but not both. Stations entering the 8-hour sections may operate for more than eight hours, and nominate which 8-hour period they wish to claim for scoring purposes. The 8-hour period does not have to be contiguous – for example: a 5-hour period may be worked on Saturday afternoon and a 3-hour period on Sunday morning, etc.

Rover stations: The Rover section is for all portable or mobile stations that operate from more than two Squares or change Squares more than twice.

Entering more than one section: If a Portable or Rover station spends part of the contest period operating from their home station, they may also enter the Home station section.

Two operators: If two operators set up a joint station with shared equipment, they may choose to enter Section A, B or D as separate stations under their own callsigns, or Section A, C or D under a single callsign. If they enter as separate stations, they may not claim contacts with each other.

Multi-operator stations: Portable stations with more than two operators must enter Section B under one callsign. Operators of stations in Section B may not make contest exchanges using callsigns other than the club or group callsign. Home stations may enter as a multi-operator station, but only one callsign can be used.

Operating Rules

One callsign per station. Operation may be from any location. A station is portable only if all of its equipment is transported to a place that is not the normal location of any amateur station.

You may work stations within your own locator Square.

Portable stations may change location during the Field Day, provided that the station is dismantled and reassembled at each move.

Repeater, satellite, EME or crossband contacts are not permitted.

Except for CW, no contest operation is allowed below 50.150 MHz. Recognised DX calling frequencies must not be used for contest activity. Suggested procedure for SSB stations is to call on .150 or higher on each band, and QSY up to make the contest exchange.

Stations may enter either Division 1 or Division 2, or both.

About Contest Exchanges

RS or RST reports, a serial number, and your 6-character Maidenhead locator (the Sub-Square). The Maidenhead locator is optional if it has already been exchanged in a previous contact during the Field Day and neither station has moved since then.

Note that Squares must be used for Division 1 scoring calculations.

Repeat Contacts – Re-work Period

Stations may be worked again on each band after two hours have elapsed.

If either station moves to a new location in a different Square, repeat contacts may be made immediately. If the station moves back into the previous locator Square, the re-work period limit of two hours still applies to stations worked from that Square previously.

Your Log

Your log should cover the entire operating period and include the following information for each contact: UTC time, Frequency, Station worked, Serial numbers and locators exchanged.

All-band stations cannot submit a separate log for a single-band or four-band entry.

Logs for a single-band operation must not include any contacts on other bands.

Logs for a digital operation must not include any contacts using non-digital modes.

Logs for a four-band operation must not include any contacts on other bands.

Division 1 Scoring

For each band, score 10 points for each **Square** (4-char. locator; i.e. the first 4 characters of your 6-char. locator) in which your station operates, plus 10 points for each Square worked, plus 1 point per contact. Multiply the total by the band multiplier, as follows:

6 m	2 m	70 cm	23 cm	Higher
x1	x3	x5	x8	x10

then total the scores for the bands used. Thus, the score is based on totalling the number of locator Squares worked and the number of contacts made.

Division 2 Scoring

All contacts are scored on the basis of one point per kilometre, multiplied by the scoring Multiplier for each band in Table 1, with points/100 km applied after 700 km for 6 m, 2 m and 70 cm, to 'flatten' scores for DX experienced under enhanced conditions on these bands. A 200 km contact on 432 MHz would be 200 x 2.7 = 540 points. A 1000 km contact on 50 MHz would be 703 x 1.7 = 1195.1 points [1]. The distance error of using Sub-Square (6-char.) locators is small and is sufficient for the purposes of this event.

Band	Multiplier	Distance Scoring
50 MHz	1.7	1 point / km to 700 km; thereafter 1 point / 100 km or part thereof
144 MHz	1	1 point / km to 700 km; thereafter 1 point / 100 km or part thereof
432 MHz	2.7	1 point / km to 700 km; thereafter 1 point / 100 km or part thereof
1296 MHz	3.7	1 point / km.
2.3/2.4 GHz	4.4	1 point / km.
3.4 GHz	5.4	1 point / km.
5.7 GHz	6.4	1 point / km.
10 GHz	7.4	1 point / km.
24 GHz & up	10	1 point / km.

Total the scores for the bands used.

Submitting Your Logs

Only electronic logs in ASCII text (.txt) format will be accepted from now.

The free VK Contest Log (VKCL) software, from Mike VK3AVV, caters for the VHF-UHF Field Days (including Division 1 and Division 2 scoring) as well as a host of other contests. You can download it from: *www.mnds.com.au/vkcl/*

A **Cover Sheet** must be included with your log, which clearly states the Contest event (i.e. Winter 2015 VHF-UHF Field Day) and its date; Division 1 / Division 2 (as appropriate); the relevant Section-Subsection and the Period (24 hr or 8 hr); Name and Callsign of operator submitting the entry; Names and Callsigns of other operators for Multi-operator stations; contact email address; mailing address, and a declaration that the operator/s have abided by the rules.

Upload your logs via the WIA website Field Day Log File Uploader, at: *www.wia.org.au/members/contests/upload/*

Logs must be received by midnight, **Monday 6 July 2015**. Early logs would be appreciated.

Certificates

Each top-scoring station in every Section / Sub-section will receive a colour certificate in .pdf format, sent to the contact email address on their log cover sheet.

In addition, colour certificates will also be sent to all second and third place-getters and top-scoring Foundation stations.

Check for Updates

Check for any updates or advisories on the VHF-UHF Field Days website at: *www.wia.org.au/members/contests/vhfuhf/*

Photo 1: Andrew VK1DA favours Mt Ginini as a field day location. Adan Willemse VK1FJAW helps to set up. Photo by Andrew Davis VK1DA.

The Next Event

The Spring 2015 Event will be over Saturday 14 and Sunday 15 November, 2015.

References

- Roger Harrison VK2ZRH, *The basis of distance-based scoring for the VHF-UHF Field Days, Amateur Radio*, June 2014, pp 11-13.

Photo 2: The station at VK4WIE located at Cleveland for the Summer 2015 VHF/UHF Field Day.

ALARA

Margaret Blight VK3FMAB – Publicity Officer

Time is moving on again this year. Autumn is upon us with its cooler weather and we are coming closer to the ALARA 40th Birthday weekend. By now I hope you have sent in your deposit for the main event on Saturday when we celebrate the actual birthday. See President Jean's contact email address below. As there has been interest from interstate ALARA members we have put together an optional itinerary for people who may be spending the week-end in Melbourne and would like to spend some time exploring.

Itinerary

Saturday 25th July 2015: Celebration Lunch at Novotel Hotel, Glen Waverley 12.00 - 4.00 pm

Sunday 26th July 2015: Optional activity for interested YLs. A small charge may be necessary but majority costs will be subsidised.

Bus tour: Pick up from Novotel at 9:30 am. Covering Visitor's Centre, Shrine of Remembrance, Melbourne. Luncheon at Retreat Hotel, East Brunswick (from "The Sullivans" TV series) 2-course meal approx. $20.00. Visit to Abbotsford Convent.

Note: City drop offs can be made after the bus tour on Sunday if required.

Can you assist?

President Jean VK3VIP is anxious to make contact with some of our earlier ALARA members. If anyone can supply up to date information on the following please send to *jeanfisher@optusnet.com.au*:

Irene Robinson YF/VK3YER, Jenny Roper YF/VK3YFF, Dr Kate Duncan, Joan Poulter YF/VK3RA, Heather Bedson, Judy Gellert (daughter of VK3AEU), Heather Mitchell VK3AZU, Marilyn Meizis VK3AO and Jean Truebridge.

Photo 1: L-R: Robyn VK3WX, Margaret VK3FMAB, Elsie, Pat VK3OZ, Kaye VK3FKDW, Donna VK3FRET, Jean VK3VIP, Marian. Front row Cheryl VK3FCYL and Cristina VK3FCRS.

Your assistance would be appreciated.

News from VK3 – Margaret VK3FMAB

On Saturday 21st February, 10 ALARA members plus OMs met for lunch at the Glass House Restaurant abutting Caulfield Racecourse. As it happened it was a special race day so there was plenty of opportunity to note the many race goers attending and observe the fashions.

It was good to see everyone again and to catch up on the news. It was a pleasure to see Kaye VK3FKDW since she has taken on the role of Secretary to the Publication Committee of the Wireless Institute and is doing a sterling job.

ALARA had a table at the EMDRC White Elephant Sale in March.

NEWS FROM VK2 - Dot VK2DB – State Representative

In March the Hornsby and Districts Amateur Radio Club (HADARC) had a Stall in the Mall operating as part of the Seniors Week Activities in Hornsby's Healthy Living and Lifestyle Festival.

Photo 2: Dot VK2DB with Anne.

On Friday we had a booth with canopy and great display area. I had a table for Women in Radio / ALARA and had pictures displaying some aspects of how YLs use their radio licences.

I was able to 'show and tell' working out in the sticks, contests (with an award), DXpeditions, JOTA, our sponsorship scheme and groups at the International Meets. A lot of talk was about the number of women and young girls joining the hobby because of the Foundation licence. One lady who was excited to meet me was Liliana who was YU1DM in 'old Yugoslavia'. She has no interest in reviving her hobby now, but her eyes shone with memories as we talked and she was very pleased to know that 'now so many ladies are on air'.

Another visitor who came especially to see me was Anne, the daughter of Joy VK2EBX SK. Joy was an avid DXer from the centre of NSW. She wrote many poems about amateur radio and I had emailed to ask permission to put them on our website. Joy's daughters were thrilled to know the poems will be used and that Joy is being remembered. For just over a year before she died, I used to have a sked on 40 m every weekday morning with Joy, and some of her contacts from over the years would pop in to say hello, pleased to catch up with her again.

In the mall on the Saturday we had to compete with the political parties doing their pre-election campaigning and we think some people avoided us thinking we were part of the campaigning.

Some of the local State candidates came to check us out and we found one has his amateur radio licence, so he can't be *that* bad (of course, I've forgotten which political party).

News from VK4 – Lyn VK4SWE, State Representative

We had a great joint-meet-up for ALARA and ANZA members last weekend (Saturday 28th February 2015) with 15 people attending.

Photo 3: left to right: Catherine VK4GH, Diane VK4DI, Micheline VK4FMGE, Lyn VK4SWE, Maureen XYL of Mike VK4EF, Penny XYL of Ralph VK4HR and Bambi VK4AYL.

Lyn and her OM Tex VK4SWE were on their way home after a trip to Ireland and it was a great opportunity for everyone to catch up.

Bambi VK4AYL found us a terrific venue at Pelican's Rest, Wynnum, just across the street from the seafront; Col VK4CC arranged for platters of fresh seafood and chips; and everyone arranged the seating so that we all got to chat with each other for about 90 minutes, covering a range of topics from bee-keeping to desalinators, with plenty of amateur radio topics in there as well. There was even a Morse key on the table (of course!).

It was great to see old friends and new, and thanks to everyone for making the journey, especially Di VK4DI and Bill VK4ZD who travelled 90 minutes each way from the Lockyer Valley. Lyn finally got to fulfil one of her duties as ALARA VK4 Rep by arranging (with help from Bambi and Col) a meet-up for members. And thanks to ALARA ladies for sharing the morning and enabling Lyn to meet up with some of the local ANZA DX Net members at the same time. Not sure Tex could have handled TWO amateur radio outings hi hi :-)

We had some interesting conversation on various types of desalinators with Ralph VK4HR and Catherine VK4GH; Tex discussed outboard motors with some of the guys and Bambi shared some information on her bee-keeping project and gave Lyn VK4SWE a sample of the finished product which made it safely back to Sweers Island and is delicious. Ralph VK4HR returned an old Czech Morse key to Lyn, as he has upgraded to a Bencher paddle and promises to practice more hi hi.

I am sure we could have stayed longer and covered even more topics but the busy Saturday lunchtime crowd was starting to arrive so we packed up, with a detour to have a look at another aspect of the hobby - radio controlled aircraft. Col VK4CC had his jet in the back of his van and he explained its workings to pilots Tex and Peter and other interested members.

Thanks to everyone for taking the time to attend at short notice, apologies to those who could not make it due to prior commitments, and hopefully there are more "eye-ball QSOs (get-togethers)" in the future. A special thanks to Col and Bambi for organising everything while we were in the air on our way back from Ireland!

Silent Key

Joy Charles VK5YJ

Joy was one of Geoff VK5TY's students. She obtained her Novice call VK5NRQ in November 1978 and upgraded to VK5YJ a couple of years later.

Joy's OM Ted was an amateur when they married (VK5YQ) and subsequently one of their daughters, Joyanne and their son Kym also obtained their amateur licences; they were a very well licensed family.

Almost as soon as she obtained her licence, Joy joined ALARA and was a keen member, she was State Representative for VK5 from 1983 - 1985 She attended the ALARA Birthday lunches each July but was not able to join the YLs on a more regular basis because of her other commitments

Joy was also heard on commercial radio, through 5UV. This station started life as the Adelaide University station, in the University grounds, but in about the 1990s it moved to North Terrace and became a popular community station. For 22 years Joy ran a

music program during which she talked to many people regularly.

She had a faithful following and played many requests for these "on-air" friends. She had an extensive collection of vinyl records and took great care in choosing from among them, to make up each week's program. When ill health prevented her from her regular program she missed it and was herself much missed.

Joy was the Director of WICEN in VK5 at the time amateurs were first allowed to pass third party messages. She was involved in an international yachting carnival and one of the first cycling events where amateurs ran the communications and she was involved in the first Classic Adelaide car rally, all of which she ran very well and enjoyed enormously.

For many years she drove all over the State, with one of her daughters beside her, and became well-known at many of the National Parks and beauty spots where they used to walk. For some years, latterly one of Joy's daughters brought her to the Christmas and mid-year luncheons of the AHARS as there are a number of ALARA members who are also members of AHARS. She was a lovely lady and will be missed by her many friends.

Contributed by Christine VK5CTL.

AMSAT-VK

AMSAT Co-ordinator
Paul Paradigm VK2TXT
email: *coordinator@amsat-vk.org*

Group Moderator
Judy Williams VK2TJU
email: *secretary@amsat-vk.org*

Website:
www.amsat-vk.org

Group site:
group.amsat-vk.org

About AMSAT-VK

AMSAT-VK is a group of Australian amateur radio operators who share a common interest in building, launching and communicating with each other through non-commercial amateur radio satellites. Many of our members also have an interest in other space based communications, including listening to and communicating with the International Space Station, Earth-Moon-Earth (EME), monitoring weather (WX) satellites and other spacecraft.
AMSAT-VK is the primary point of contact for those interested in becoming involved in amateur radio satellite operations. If you are interested in learning more about satellite operations or just wish to become a member of AMSAT-Australia, please see our website.

AMSAT-VK monthly net

Australian National Satellite net

The net takes place on the 2nd Tuesday of each month at 8.30 pm eastern time, that is 0930 Z or 1030 Z depending on daylight saving. Check-in starts 10 minutes prior to the start time. The AMSAT VK net has been running for many years with the aim of allowing amateur radio operators who are operating or have an interest in working in the satellite mode, to make contact with others in order to share their experiences and to catch up on pertinent news. The format also facilitates other aspects like making 'skeds' and for a general 'off-bird' chat. In addition to the EchoLink conference, the net will also be available via RF on the following repeaters and links.

In New South Wales
VK2RBM Blue Mountains repeater on 147.050 MHz

In Queensland
VK4RIL Laidley repeater on 147.700 MHz
VK4RRC Redcliffe 146.925 MHz IRLP node 6404, EchoLink node 44666

In South Australia
VK5TRM, Loxton on 147.175 MHz
VK5RSC, Mt Terrible on 439.825 MHz IRLP node 6278,
EchoLink node 399996

In Tasmania
VK7RTV Gawler 6 metre repeater 53.775 MHz IRLP node 6124
VK7RTV Gawler 2 metre repeater 146.775 MHz IRLP node 6616

In the Northern Territory
VK8MA Katherine 146.700 MHz FM

Operators may join the net via the above repeaters or by connecting to EchoLink on either the AMSAT or VK3JED conferences. Past experience has shown that the VK3JED server offers clearer audio. The net is also available via IRLP reflector number 9558. We are keen to have the net carried by other EchoLink or IRLP enabled repeaters and links in order to improve coverage. If you are interested in carrying our net on your system, please contact Paul via email. Frequencies and nodes can change without much notice. Details are put on the AMSAT-VK group site.

Become involved

Amateur satellite operating is one of the most interesting and rewarding modes in our hobby. The birds are relatively easy to access and require very little hardware investment to get started. You can gain access to the FM 'repeaters in the sky' with just a dual band handheld operating on 2 m and 70 cm. These easy-to-use and popular FM satellites will give hams national communications and handheld access into New Zealand at various times through the day and night. Currently only SO-50 is available.

Should you wish to join AMSAT-VK, details are available on the web site or sign-up at our group site as above. Membership is free and you will be made very welcome.

VK7news

Justin Giles-Clark VK7TW
e *vk7tw@wia.org.au*
w *groups.yahoo.com/group/vk7regionalnews/*

Congratulations to Rex Moncur VK7MO who was awarded the prestigious UK Fraser Shepherd Award by the Radio Society of Great Britain Board. This award recognises research into microwave applications for radio communication and in Rex's case the Board cites - the new ~2700 km terrestrial 10 GHz distance record and a range of other highly creditable DX/EME achievements, JT-modes, Doppler compensation and many more achievements in this field. Recent recipients of this award include Charles Suckling G3WDG and Joe Taylor K1JT.

Meet the Voice gathering

Thanks to Cedric VK7CL for the information on the annual MTV gathering which is held in the picturesque midlands village Ross and hosted by the Sewing Circle Net. The weather gods were kind and helpers Rod VK7TRF and Warren VK7NWQ setup PA, stage and equipment ready for the Sunday event. Visitors started to arrive from 9 am and a steady trickle of arrivals continued until 11 am. Thanks to Corrina XYL of Warren who sold tickets for the raffle including a Baofeng Dual Bander and some excellent bottles of handcrafted wine donated by Geoff VK7GW and his winery.

1145 am kicked off official proceedings starting with a tribute to Ray VK7VKV for his contributions to amateur radio over the years. The raffle was drawn with Peter VK7PL winning the wine and Neil VK7NX winning the Baofeng Dual Bander. Then the presentation of the Sewing Circle Trophy: awarded to "the most loquacious member of the Sewing Circle Net for the previous year".

Photo 1: Alvin VK7ADQ (left) receiving the Sewing Circle Award from Geoff VK7GW (right). Photo courtesy of Warren VK7NWQ).

It is presented by the previous holder in Geoff VK7GW who presented Alvin VK7ADQ with the beautifully crafted Trophy.

The money raised on the day was donated to the Flinders Island Amateur Radio Club to assist with the setting up and maintenance of their new repeater station. Alvin has setup a website for the event that can be found at *www.meetthevoice.org*

VK7 Repeater News

The Hobart D-STAR repeater is now active and licenced as VK7RCR. It is on 146.9625 MHz with a -1.6 MHz offset. Its dashboard can be found at *vk7rcr.dsatargateway.org* Thanks to Richard VK3JFK, Bob VK7RX and Alan VK7ZAR for their assistance in setting it up.

The new tower, enclosure and fittings for the new VK7RMD is very close to being heli-lifted into place on its new mounts on Mt Duncan thanks to Dion VK7DB and his team. Watch this space! NTARC report the repeater lease for Mt Arthur has been secured along with rental arrangement with the Tasmanian Parks and Wildlife Service for the new NTARC repeater to replace VK7RAA on Mt Barrow.

ANZAC Celebrations

VI7ANZAC was on air from April 25 to May 2 by Vince Henderson, VK7VH. Vince operated from his home QTH on all HF bands along with 2 m and 70 cm. Vince played some rare audio files interviews with ANZAC veterans including Alec Campbell the last living ANZAC. If you made contact with Vince there is a special commemorative QSL card available via eQSL and LOTW.

From May 31 to June 2 NTARC will be activating VK100ANZAC with a focus on local ANZAC veteran Harry Murray who completed a 3-week period of continuous action on Gallipoli, for which he was awarded his first bravery decoration, the Distinguished Conduct Medal, Victoria Cross and Distinguished Service Order and Bar along with the Cross of St Michael and St George and the French Croix de Guerre. Harry was both the most decorated Australian and Empire Soldier of the war and indeed today remains the most decorated soldier in Australian military history. A special commemorative QSL card is also available.

Cradle Coast Amateur Radio Club

The CCARC have restructured meetings in 2015 so that every second month the meeting will be a Wednesday night with a social/ technical theme. So, March, May,

Photo 2: Peter VK7KPC and Roger VKARN at remote checkpoint for the TEERA event. (Photo courtesy of Alvin VK7ADQ).

July and September meetings will be Wednesday evening meetings commencing 7.00 pm at the Penguin High school.

Northern Tasmanian Amateur Radio Club

Over the weekend of the 7-8 March NTARC assisted the Tasmanian Equine Endurance Riders Association State Championships at Sassafras in NW Tasmania. This ride included a 160, 120 (both over Saturday night) and 40 km rides. NTARC provided safety communications and RFID tracking. Thanks to the following participants: Norm VK7KTN & XYL Lorraine, Wayne & XYL Meg, Margie, Ken VK7KKV & XYL Bette and Alvin VK7ADQ started at base camp. The other checkpoints were manned by Rosco VK7RC, Yvonne VK7FYMX, Idris VK7ZIR, Andre VK7ZAB, Peter VK7KPC and Roger VK7ARN. There were some changeovers through the afternoon and night to ensure checkpoint coverage throughout the night. All went smoothly.

Radio and Electronics Association of Southern Tasmania

REAST is pleased to announce their remaining office holders for 2015: Paul Hanson VK7PAH is Secretary/Public Officer and Richard Rogers VK7RO is Treasurer. REAST's March presentation was given on Streaming Media by Tony VK7VKT. Tony showed the freeware application (KODI/XBMC) and free streaming media that is available via the internet to your home TV. Tony's comment: "why let the networks determine what you watch when there is so much free streamed content available" and this resonated with many at the presentation. Thanks Tony.

The author, Reuben VK7FREU and Reg VK7KK took a group of 16 Cub Scouts and leaders through what radio and amateur radio was all about and what happens on top of the Queen's Domain Wireless Station. The session included videos, questions & answers, scavenger hunt, presentation on SOTA, DATV, Morse code, the ISS and a fascination with that squid pole!

Our DATV Experimenter's nights have included some great presentations by Rex VK7MO on the 10 GHz & 24 GHz World Records and interesting signal anomalies caused by wind turbines. Planning SOTA activations and the free resources available, new beacons, what the backs of eyeballs look like and extracting dust from notebooks. Our videos have been from Ham Radio Now for the past month.

Photo 3: Freeware XBMC Media centre software. (photo courtesy of Justin VK7TW).

Plan ahead

Gippsland Gate Radio & Electronics Club Hamfest | 18 July

VK3 news Eastern & Mountain District Radio Club

Andrew Scott VK3BQ

Photo 1: The crowd searches for bargains at the Hamfest. Photo by Andrew Scott VK3BQ.

Photo 2: Mona from RF Solutions displaying some impressive new equipment at the Hamfest. Photo by Andrew Scott VK3BQ.

Hamfest success

In late March the club held our annual Hamfest with great success, we had over 350 people attend a lovely autumn day in Melbourne's East. A great selection of commercial and private traders made the day a success with a wonderful selection of new and old equipment. The BBQ was busy out the front cooking up a storm with hundreds of sausages, hamburgers and egg and bacon sandwiches.

Photo 3: The VK3ER/P John Moyle Field Day station setup in the Wombat State Forest. Photo by Andrew Scott VK3BQ.

The canteen handed over a couple of hundred cups of tea and coffee. Lots of people had a chance to catch up with old friends out the front, and everyone had a great day.

We look forward to seeing everyone at our 2016 Hamfest. Dates and information for the 2016 event will be posted on the club's website soon.

John Moyle Field Day

The VK3ER/P contest team headed to our normal VHF/UHF site near Blackwood and operated HF and the higher bands, we had a great success making lots of contacts on all the bands, testing our portable station and having a good time. Damian and Ralph also headed to their location near Ballarat and operated the VK3KQ/p station and also had a successful weekend. Thanks to everyone who went out portable and operated in the contest.

Standard and Advanced licence upgrade course

Our standard and advanced licence upgrade study classes are well underway now and club members attending are learning lots, the exams are planned for the middle of the year, if you would like to attend an upgrade course or undertake your exam at the club please head to the club website for more information: *http://www.emdrc.com.au/*

Photo 4: The VK3ER/P station working long into the night during the John Moyle Field Day 2015. Photo by Andrew Scott VK3BQ.

Saturday Clubrooms Openings

Our Clubrooms are open on the first and third Saturday mornings of each month following our regular Friday night club meetings. We have a well-equipped workshop for members use and the radio room is setup for members to use. The pod coffee machine is always ready, visitors and non-members are always welcome. Pop in and say hello.

Our Club **Annual General Meeting** will be held on Friday 5th June at the Willis Rooms at the Whitehorse Civic Centre in Nunawading. More details on the club website.

Photo 5: The Club's well equipped workshop, available for member use. Photo by Andrew Scott VK3BQ.

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 welcome and will be considered for publication.

Articles attached to email are especially welcome. The WIA cannot be responsible for loss or damage to any material. Information on house style is available from the Editor.

VK6news

Keith Bainbridge
e *vk6rk@wia.org.au*

Don't these months go around quickly? Yet another one gone and I still haven't got much further with any of my own radio projects, but at least the dish for 23 cm EME is up and tracking :)

So around the clubs, first off is the **Bunbury Radio Club**, over to Norm VK6GOM.

It is with some sadness, that we will be losing one of our stalwart members, Barry Mitchel VK6WF. Unfortunately for personal reasons, Barry is moving to the other side of the country and will be sorely missed. Barry is a white stick operator who has spent much of his time with the club helping other members.

The local IRLP is still down, but hopefully should be working soon. Apparently the main problem now centres on obtaining admin rights for the software. I'm told this will be resolved shortly and we will still be respected in the morning.

The future home of the Bunbury Radio Club, a shed at the QTH of Richard VK6VRO, is nearing completion. The roof is on and the fittings are being installed.

There are still some surplus 2 metre beams available for sale at a very reasonable price. If you are interested in one of these bargains contact Alek VK6AP.

On 18 April, we ran assessments for members and others wishing to sit for their Foundation licence or upgrade their existing qualifications. As of early April, we have four Foundation, two Standard and one Advanced aspirant: Good luck everyone.

Our next meeting is on 11 April at 1400 at the QTH of Richard VK6VRO. All visitors are welcome. For further details contact our secretary Brian VK6TGQ on 0403 975 953 or *vk6brc@wia.org.au*

Photo 1: A view of the Hills Amateur Radio Group set up for the John Moyle Field Day, including the 3-element HF Yagi.

Photo 2: Sawyers Valley Volunteer Fire Brigade operation. From the left we have Adrian VK6NAK, Rick VK6XLR, Reg VK6BQQ, Peter VK6IS and Andrew VK6WAM.

Thanks Norm, I hope all went well at the assessments.

Next up we have HARG with a report on their John Moyle Field day activities:

Members of the **Hills Amateur Radio Group** (HARG) gathered on the top of Mount Gungin at around 8 am for the John Moyle Field Day. Mt Gungin is around 30 km east of Perth on the Darling Scarp, around 300 m high.

In short order the 3-element Yagi had been put together by VK6RC, ably assisted by VK6DW (that's me of course) and we had it sitting on top of the portable tower provided by Ray VK6ZRW through his work. It was about 10 m in the air. We basically set it facing east for the entire 24 hours with only a brief time facing north to try and catch some of the Russian DX competition happening during the time the eastern VKs went QRT (and presumably to bed).

A horizontal loop supported from Jarrah trees was arranged by VK6PWD. The loop was around 10 metres high, probably around a 100 m in diameter and fed to an antenna tuner via ladder line also made by Ray. We erected a 2 m and 6 m verticals but not a lot of contacts were made on these bands.

The station was composed of an all band Icom IC-7000 with an Ameritron 811 amplifier and ATU. We also had a laptop to run the VKCL logger. We built a great station in about 90 minutes after starting putting it all together, and operated it from start to the finish of the field day without a hitch. We did take a break for a 4 or 5 hours around 11 pm. All of the eastern VKs had apparently gone to bed! Ray had us up around 5 am to continue the quest for contacts. Slave driver!

Part of any station is the power supply and this was provided by a couple of Honda generators. We had two and these plugged away continuously for the 24 hours and were very RF friendly. Something to note as one of the other generators we tried was very RF unfriendly with quite a lot of racket on 20 m.

In the end we made 294 contacts for a score of 664 points according to the VKCL logger. The station was taken down and packed away in short order and we left Mount Gungin to the thronging horde of push bike riders who were arriving in great numbers to take part in a race. Quite a number of them showed interest in our activities, so we were able to promote the cause of amateur radio.

Looking forward to next year!

Cheers,

VK6DW

John Moyle featured highly this month, next a report from the **Sawyers Valley Volunteer Bush Fire Brigade** (AR Section) thanks to Adrian VK6NAK:

For the first time, the Sawyers Valley Volunteer Bush Fire Brigade participated in the John Moyle Memorial Field Day, operating a portable station from their fire station in Sawyers Valley.

Work started at the station a little behind schedule, with the usual brigade business and vehicle checks needing to be completed first. Attention was first turned to

antennas, and a short game of *"I can throw higher than you!"* was held, with Keith VK6WK, Andrew VK6WAM, Peter VK6IS, Rick VK6XLR and several others taking it in turns to throw various objects on the ends of ropes into the many trees surrounding the fire station. Eventually two dipoles were hoisted aloft, one for 20 m and the other for 80 m.

Adrian VK6NAK also erected his special "pool-pole and fishing-rods" 20 m dipole. Some work was also put into standing up an assortment of galvanised pipes, approximately 10 m long, to mount a 2 m folded dipole, however it was decided that the structure wasn't sturdy enough and the whole rickety enterprise was abandoned.

With some wire in the air, and some food in our bellies, courtesy of Keith and the local deli, power supplies became the next order of business. Andrew had brought along his 100 Ah SLA battery and a box of PowerPole connectors. Some crimping and soldering later we were ready to power on... or would have been if the battery had held its charge. Adrian was making do with a 72 Ah wheel-chair battery, however it was decided that even that wasn't up to scratch and was limiting the transmit power of his IC-706MKIIG. Time to roll out the big guns, in the form of the fire station's 5 kVA generator! Some lateral thinking by Keith pressed into service some halogen work lights to help properly load the genset.

And with that Sawyers Valley Volunteer Bush Fire Brigade was on the air! It quickly became apparent that propagation conditions were less than ideal, being still depressed from the recent solar activity. However the Hills Amateur Radio Group and the Peel Amateur Radio group were both set up reasonably nearby and provided a few guaranteed contacts across a variety of bands.

Having only one radio with an ATU also soon proved to be a major problem, effectively limiting that radio to a single band. A venerable Codan 7411Mk2 Antenna Tuner and a hastily strung up random wire allowed for a little more frequency agility, although performance was a little underwhelming.

Photo 4: Mount Dale, what a view!

Peter, Keith and Adrian managed to spend about four hours on the air before family duties (Adrian's birthday dinner) brought the operation to a premature close. Contacts were made with several Eastern States stations, as well as most of the other WA groups.

The field day proved to be an excellent learning experience, with members learning a lot about some of the difficulties involved with operating a portable radio station effectively. The brigade will hopefully be able to build on this experience for both next year's field day and also any potential emergency operations in the future.

Many thanks to all of the visitors who attended the station to assist:

Peter VK6IS, Andrew VK6WAM, Rick VK6XLR, Reg VK6BQQ, John VK6WC, and some members from the Mt Helena Volunteer Bush Fire Brigade who called in to take a look. Hopefully next year some more volunteer brigades and emergency services groups can be encouraged to join in the fun. Adrian VK6NAK and Keith VK6WK.

As can be seen from the pic it was a most comfortable operation and can only get better next year, well done folks.

An update from the repeater group **WARG:**

On behalf of the West Australian Repeater Group (WARG), President Anthony VK6AXB advises that members and visitors alike are welcome at WARG's 2015 AGM, on Monday May 4th. A number of changes to Committee positions are required, due to WARG's rule which encourages renewal by ensuring that no-one can hold the same position more than three years running.

The AGM, like all WARG meetings, will be held at the Peter Hughes Scout Communications Centre, corner Gibbs St and Welshpool Rd, East Cannington. Doors will be open a 7 pm, for a 7:30 pm start. Tea & coffee is available, and there's usually time for socialising before and after the meeting.

Regular WARG meetings take place on the first Monday of every month (or the second Monday, if the first one's a public holiday), with our next meetings after the AGM being Monday 8 June and Monday 6 July. All are welcome to attend.

WARG's Technical and General net continues every Sunday at 1030 local time, on VK6RLM Roleystone, 146.750.

More information is available on WARG's website which is *www.warg.org.au*, or email *secretary@warg.org.au*

Thanks Anthony for the update.

Now the newest group to contribute to these notes of ours **WA Amateur Radio News Inc** from Bob VK6POP:

Western Australia's newest Amateur Radio Club, WA Amateur Radio News, had its first outing in an Aussie contest recently.

Two members, Onno VK6FLAB and Bob VK6POP, camped on top of a hill in the Darling Range east of Perth, setting up a portable station for the John Moyle Memorial Field Day. The station comprised two operating positions, with three antennas suspended from the treetops.

The antennas were a G5RV, and two dipoles for eighty and twenty metres, as well as verticals and beams for six and two metres and seventy centimetres.

The equipment was set up and tested on Friday afternoon and evening, when propagation for the contest looked promising. Unfortunately the propagation for the contest wasn't as good; however that's how it goes.

The good thing about the Aussie contests is being able to catch up with regular participants. Another notable feature of this year's contest was the healthy number of Foundation licensees taking part.

WAARN didn't win the JMMFD, but watch out for them in 2016.

Thanks for this update Bob & Onno, I look forward to hearing from you every month in future ;)

A group of amateur satellite enthusiasts got together on 29th March and this is what they did, thanks to Andrew VK6AS:

A small group of VK6 satellite enthusiasts and interested amateurs got together on Sunday 29th March on the South Perth foreshore for a fly-by of SO-50, much to the amusement of jet skiers and even the water police who arrived in their craft with flashing blue lights, but no sirens! We were pleased to report to them that we were neither talking to aliens nor causing any interference to police communications!

The group of about nine, made QSOs both within the attendees and also with distant stations, bouncing off the repeater on Saudisat 1c, using a combination of UHF and VHF signals and a variety of antennas.

It is planned to give a full report on satellite activities in VK6 in a future edition of *AR* magazine, so please watch this space.

Further satellite awareness meetings are planned and will be advertised on NewsWest and the *VK6.net* website.

A great reference source for anyone that is interested is *amsat.org* or for more local material do a google search for amsat-vk.

The NCRG also ventured away from hallowed ground at Ham Heaven to participate in John Moyle, for the first time in about 16 years mainly because we were frowned upon for winning it two years on the trot. We had used the satellites to get humungous points when no one else in Australia had them in the footprint. I guess we were sore losers and switched to the international contests a week later for the past 16 years. Anyway we ventured to Mt Dale with a semi serious attempt to participate, virtually QRP, and to put to good use all the portable/SOTA gear with which many members have become obsessed.

Several antennas were erected for 80 m to 23 cm, wires, beams, verticals and a good kitchen :)

I have to be honest I had a ball :), there were about 12 members present and what with the competition to see whose vertical or linked dipole worked the best, it proved a great day. Lewis VK6FLEW set up his new hammock for many to practice relaxing :)

Once the club trailer is finished (by the time this is published) we will be a much better position to go portable. At the club things are moving along at the usual slow pace, mainly due to many members "other commitments" and I'm one of them who is guilty of that but progress on all projects is being made.

We have had an influx of new members lately and things are looking promising for the future of AR in the Northern Suburbs.

We are negotiating a remote site for our 2 m and 70 cm repeaters and for the 10 m beacon to enable them to be left operational when contests are happening at the club and for future remote operation via the net for members not able to put up their antennas in retirement homes etc. At present these facilities are turned off to minimise interference both ways. More on that soon.

That's it for this month folks, thanks for your contributions once again and I look forward to receiving the next month's offerings before 29th May.

73 from Keith VK6RK

South East Radio Group
AMATEUR RADIO CLUB

South East Radio Group

51st Convention & Foxhunting Weekend

When:

Saturday 6th and Sunday 7th June 2015.

Doors open Saturday 7th at midday and 9:00 am on Sunday.

Where:

Mount Gambier Scout Group Hall in Margaret Street, Mount Gambier.

Catering:

Excellent, reasonably priced catering will be continuously available for the duration of the convention including the famous steak sandwich, soup, hamburgers, Sunday breakfast selection, cakes and goodies, coffee, soft drinks and of course a happy smile from the helpers. The highly successful Convention Dinner on Sunday evening will be repeated this year.

What:

The Australian Fox Hunting Championship is a highlight of the event. Beginning at 11:00 am on the Saturday, the nine event programme runs until early Sunday afternoon. Some events may need physical agility and speed, others guile and there is always an event or two to surprise and challenge the competitors.

A home brew competition with great prizes will be held as is our tradition and there are tables of new equipment, pre-loved gear and parts that no shack should be without.
Entry fee is $5 for the weekend and this includes the lucky door prize raffle.
To book a table contact our Secretary via email using **vk5sr@wia.org.au**

Contact us:

Programme information and where to find us may be found on the club website at
http://serg.mountgambier.org
Accommodation should be booked early as this is a busy weekend in Mount Gambier.

VK1news Canberra and Region Amateur Radio Club

Pieter Kloppenburg VK1CPK

The Canberra and Region Amateur Radio Club (CRARC) has started the New Year with a successful Annual General Meeting (AGM) and a first committee meeting. This was a good time for the new committee members to familiarize themselves with the operation and maintenance aspects of the three repeater sites in the ACT: Being out in the open on the top of mountainous terrain, they are subject to rain, hail, storms, and high winds. The effects of these require constant attention to the inside and outside of the equipment building as well as the tower containing the antennas. Big birds find the antennas ideal places to perch on, with the result that the aluminium rods often bend or break off.

Our first speaker of the year was Ingmar Meins VK1BGT. Knowledgeable and experienced in electronic communications, he demonstrated some of the newer equipment radio amateurs could lay their hands on to make QSOs. He demonstrated the new HACK RF 0-6 GHz Software Defined Radio (SDR) transceiver that can operate on licensed, unlicensed, as well as amateur radio bands. He also demonstrated an all-band portable spectrum analyser, the size of an iPhone that you can take anywhere to sniff out sources of unwanted signals, or, how many harmonics your transceiver is putting out.

It seems that those heavy 25-pound transceivers from yesteryear are beginning to lose out on portable equipment that the young mobile ones like to carry with them wherever they go.

On Saturday 25 March, CRARC had a stall at the Connect and Participate Expo at the Old Kingston Bus Depot. Our stallholders were Amanda Hawes VK1WX, Murray De Plater VK1MDP and Bob McKinney. This is the second time we participated in this annual event. Of the six thousand people that pass through the gate of this Expo, hundreds saw our stall while several dozen of them enquired about our display of radio equipment. Our active radio station was popular with the crowd, causing many enquiries about amateur radio, ranging from "How do I get my licence back again", to," What is this Foundation licence all about". Our handout "Welcome to the wonderful world of amateur radio" was also popular with the crowd.

At the last general meeting, we were fortunate to have Dale Hughes VK1DSH talk to us about satellites and how they affect our lives. You will read more about this in the next issue of *AR*.

Are you ready to talk to us about your latest achievement in amateur radio? We always want to know how our amateurs achieve their goals, be it a design for an antenna-tuning unit, a solid state device, an antenna that works better than all the others, or how you got that special QSL card from Hippocatoucoulos. Email us at: *committee@crarc.ampr.org*

Cheers,
Pieter Kloppenburg

GippsTech 2015

The annual GippsTech conference is coming. GippsTech has a reputation as a premier amateur radio technical conference. It focusses primarily on techniques applicable in the VHF, UHF and microwave bands, especially for weak-signal contacts.

GippsTech 2015 will be happening on the weekend of the 11th and 12th of July, at Federation University Australia Gippsland Campus in Churchill, Victoria, about 170 km east of Melbourne.

Call for papers

Anyone wishing to share information with others is invited to submit a title and brief summary of your planned presentation to the Conference Chair Peter VK3PF as soon as possible. Please be sure to indicate your expected length of presentation; it could be a short 10 minute item through to a detailed presentation of up to an hour.

We look forward to seeing you at GippsTech in early July.

Those wishing to present at this year's conference should contact the Chair as soon as possible:

vk3pf@wia.org.au

Peter VK3PF
Conference Chair

Further details will be available from the Eastern Zone Amateur Radio Club website ***http://www.vk3bez.org/***

Add amplifier and antenna switching to your Yaesu FT-857/897

Albert Gnaccarini VK3TU

Photo 1: The RF end of the completed breakout adapter.

I've had a Yaesu FT-857D for a few years now. I bought the radio specifically because of its small package as I was planning a trip to 5W0 at the time and I wanted take the opportunity to have a few contacts while I was there. Since then, I've used it for HF mobile as well as VHF/UHF operation. All in all, I've found it to be a very useful "shack in a box" type of radio however I've been nagged by a couple of frustrating issues, particularly when using the radio for VHF/UHF home and portable operation.

The FT-857 has a couple fundamental design shortcomings that stem in part from the very reason I bought the radio – its compact size. Like its larger 897 sibling, the 857 has little space on the rear panel to fit more than a couple of antenna connectors next to the usual array of accessory connectors. Yaesu have provided a single SO-239 to serve HF and 6 m and a single N series connector for 2 m and 70 cm. That's OK if the radio is only intended to be used on one band but if you want to operate on HF *and* 6 m or change from 2 m to 70 cm as is the usual practice on the VHF/UHF Field Days, you tend to spend lots of time changing antenna leads over. If you want to run an amplifier on 2 m and/or 70 cm to boost its modest output on the VHF/UHF, that's another antenna lead change each time you change bands as well as the PA keying line. Compounding things, if you want to run an LNA for each of the higher bands to improve the radio's rather poor weak signal performance, you also have so swap over the accessory connector to ensure the right boxes key up when you fire a shot. That means lots of disconnects/reconnects each time you want to change band and becomes a real disincentive to using the radio in a single operator VHF/UHF portable or field day situation.

That said, one of the nice things about these radios is that Yaesu have provided both serial and Binary Coded Decimal (BCD) band data at the rear panel accessory connectors. The same connector also includes a keying line (for external amplifiers etc.) as well as a 'transmitter inhibit' line (to permit some delay for any external relays or equipment to settle before transmission begins). The lines are used with Yaesu's proprietary accessories depending on which mode is selected in the radios extended menu list.

The design

After consulting with a couple of local 857/897 users who shared the same frustrations as I did, my concepts started to gel.

I formed the view early that a BCD decoder with a bit of external logic was all that was needed to provide the functionality I wanted. One of the people I was talking with had already been down this road and built a similar device but it lacked some of the additional features I wanted. I considered the use of some sort of micro-controller but that would presume that I had some skill as a programmer. My experience with programming the timer on our video put paid to that notion forthwith! Anyway, making the radio do what I wanted was the priority here, not learning new programming skills.

The main parameters were set out according to my requirements. These included:

- Steer the RF to and from the radio, to and from the right antennas/amplifiers/LNAs
- Separate the external amplifier

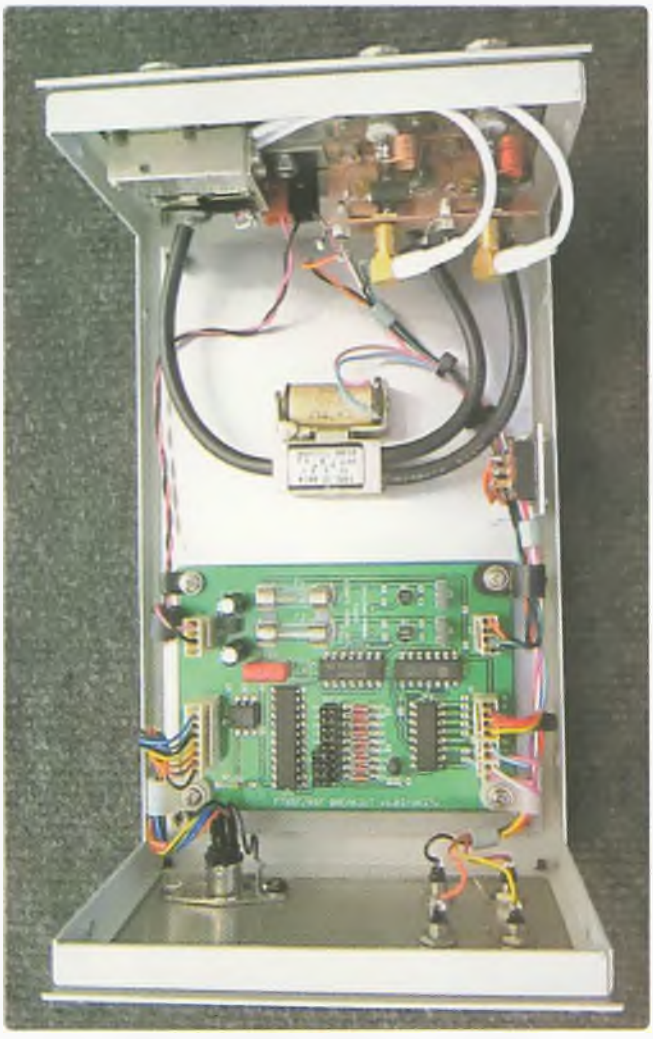


Photo 2: A view of the inside of the breakout adapter.

keying lines for each band
- Switch the LNA power supplies to the respective LNA devices in sync. with the keying lines
- Do all this imply by changing bands from the front of the radio
- Small and portable enough to operate from the car or on a field day or build into the battery space of an FT-897
- Keep costs low and not require any rocket science to build

The circuit I ended up with provides all of these functions from one single, convenient PCB that requires only two external relays of the user's choice to do the antenna steering, a single 13.8 V supply and whatever arrangements for bias tees to run the LNAs is deemed appropriate. I also thought it would be nice to be able to do some switching with the HF bands as well. For example, in the past I've run an amplifier on 20, 15 and 10 m but not on the lower bands, so I added in jumpers for the keying on the HF bands as well. The jumpers provide a convenient tapping point for control of HF switching devices in case one decides to use multiple HF antennas.

My estimate of the component cost (excluding the relays and PCB) is under $30. Relays are pretty easy to find around most hamfests and not necessarily an expensive item (look for UHF mobile radios of 1970s vintage, typically Philips FM 828 types, or ask around your club).

How it works

The circuit (see Figure 1) is based on high power CMOS and TTL logic components which are all readily available. The core device is the 74HC154 4-to-16 line decoder which takes the BCD band data from the radio and decodes it into the 12 individual bands that the radio covers. The decoded lines are then passed through some inverters and logic gates to provide band selected keying for individual external amplifiers and switching outputs for the HF/6 m and 2 m/70 cm antenna relays. A ULN2003A Darlington line driver takes care of all external switching lines. These devices take a TTL logic level input and provide an open-collector output, have built in fly-back protection diodes and can happily pull down enough current to operate the antenna relays. The circuit has a delay timer consisting of an optocoupler with some external timing components that provides the TX inhibit signal. This allows for relay settling times and sequencing of any LNA that might be in use. There are also two independent band switched and PTT keyed supply lines that are protected with 500 mA fuses for use with external bias tees and LNAs on 2 m and 70 cm.

Construction

My intention was to have all the circuitry on one PCB in the interest of reliability and portability. The only concern was to find suitable relays to do the RF switching. Given the variability of these sorts of things, I decided to keep the RF switching off the board and do it externally. It also permits the freedom of utilizing relays recovered from a variety of sources. I just happened to have a couple of suitable coaxial relays on hand so I used them but any suitable UHF relay capable of switching 30 W at 400 MHz will do for the 2 m/70 cm relay while the HF/6 m relay can be a headlamp type relay, as long as the coil is intended for use on a nominal 12 V supply and the contacts will switch 100 W at 6 m, it should do fine.

A compact package was also desirable so the use of some SMD components seemed like a reasonable idea. I elected to use 0805 series resistors and capacitors because they're inexpensive and readily available in small quantities from several suppliers on the web, can be fitted on the bottom layer of the board to save space and can be manipulated and hand-soldered by most people. The rest is garden variety "ham-shack" hardware that

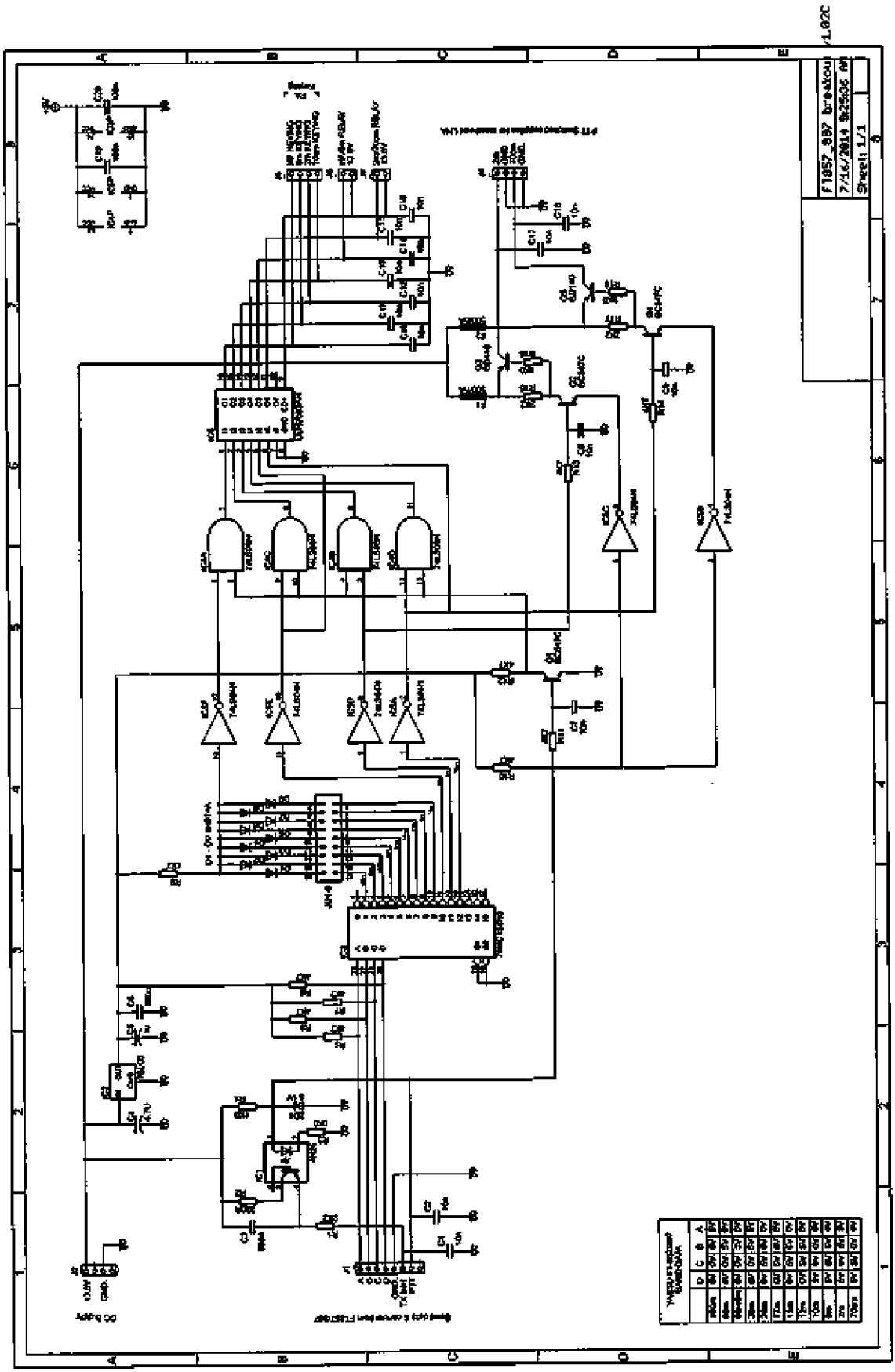


Figure 1: The schematic for t FT-8x7 breakou adapter.

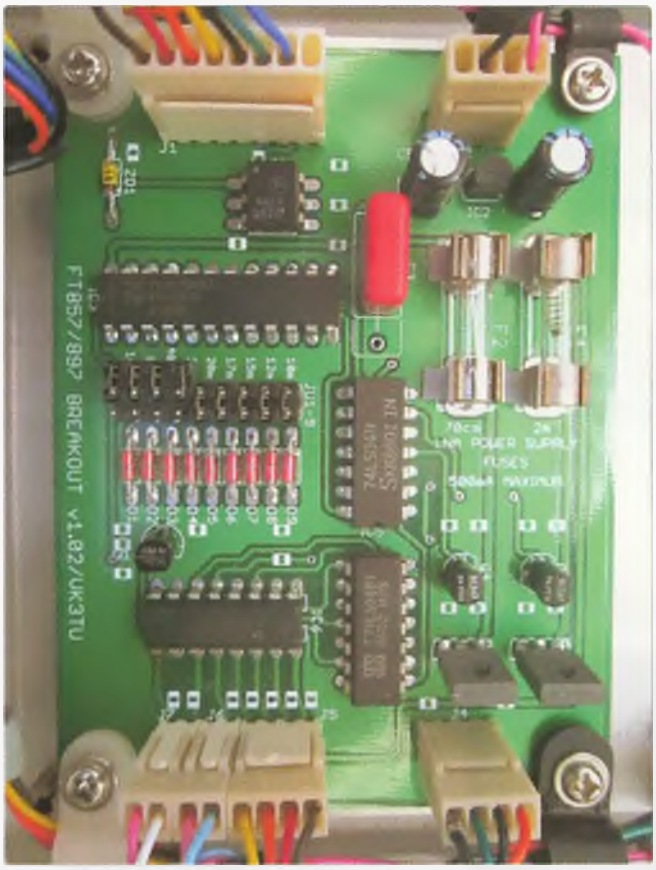


Photo 3: A close up view of the breakout board mounted in its case.

can be found pretty easily. The result a neat single 99 x 72 mm double sided PCB.

The double sided plate-through hole PCB was designed using Cadsoft Eagle (see: *http://www.cadsoftusa.com/*) and incorporates a solder mask, top and bottom component placement and pin-out documentation silk-screens. I had the boards manufactured off-shore to keep costs down and there is plenty of choice for board houses on the web.

A few words on the PCB design process are worthwhile here. Eagle, like many similar packages, allows you to design the PCB the way you want it but board production houses will generally only accept the design in Gerber file format. Gerber files are an industry standard formatted set of files that define the real-world parameters of your PCB design, in other words, what your board will look like in real life. You need to generate these files from your design software and send these files to the board house, not your CAD files.

Most board houses will build boards to a pretty good commercial standard right down to 50 mil spacing and 100 mil track size, but they do have their individual quirks. It is worth checking with the board house to see if they have a library of design rules and Gerber file generator that you can download so you can check your design in Eagle first and generate the right files for them to use. As it happens, the people I used provide both a design rule library for Eagle so you can check to see your board design conforms to the manufacturing tolerances they're happy to work with and a Gerber generator that creates the files they want. It's also a good idea to hunt around on the web to find a Gerber visualizer to check your Gerber files before you send them off. A Gerber visualizer will produce a two or three dimensional view of what your board will look like after it is manufactured. I found an excellent one at *http://mayhewlabs.com/3dpcb* which you can upload your design to and will generate a 3D image of your finished board. Once you're happy with the design, it's simply a matter of zipping up the Gerber files and sending off the order. Oh, and making the appropriate payment!

Most board also houses have a minimum order quantity and the one I used was no different. That means you end up with surplus boards, but costs also come down in quantity and if there is enough interest, it's worth doing an "ask around" to see if there is anyone else interested in building the same project. I did and had no difficulty in disposing of most of my surplus boards; I still have a few left.

The boards arrived about four weeks after the order was placed. Assembly wasn't difficult although placement of the 0805 components and soldering them into place requires a moderate hand with the soldering iron and some patience. The rest of the components all slotted into their respective places nicely indicating the precision of the board manufacture are pretty darn good. Once assembled, it was simply a matter of wiring the external relays and making up the appropriate leads, connecting it to the radio and switching it on. I included a switch to turn off the LNA supply lines to the bias T circuits in the event that I use the device with external linear amplifiers. This is optional if you only intend to use the radio bare-foot.

Conclusion

The device worked as intended and has added a new dimension of convenience to using the 857 in the field and at home. Band changing is now simply a matter of pressing the band switch buttons on the radio. All the rest is taken care of externally and there is no need to swap coax cables or keying patch leads any more. I always have the right antenna connected for each band and the keying line follows me to the next band ensuring I don't fire 20 watts of RF into the wrong LNA or into an open circuit lead. Best of all, there is no need to lift the lid on the radio, all the work happens outside the radio and I only need to connect three leads to it ONCE.

Hamads

FOR SALE – VIC

ICOM IC-T70A VHF/UHF Dual Band Handheld FM Transceiver. With Charger and Manual. As new condition. $220. Alex Stirkul VK3AMX, QTHR. 03 9850 7493. Email: *alexstirkul@yahoo.com.au*

Yaesu FL2100B with two unused 572B / T160L valves. Offers accepted. Buyer to collect, or by arrangement.

Rotator cable 7 core, unused – 40 metres. $70 plus postage.

David VK3FGE 03 5176 4664

FOR SALE – VIC

Heavy duty antenna rotator. Emotator 1102MXX. $500. Buyer to pick up.

Barry VK3JB 03 9878 8275

WANTED – ACT

One (1) hand microphone to suit a Yaesu FT-897 tx/rx. Reply to vk4dv QTHR or phone nights 0749 285 537. Merv Deakin *vk4dv1@gmail.com*

FOR SALE – ACT

Large quantity new and used transmitting and receiving valves, including some rare types. Too many to list but happy to email a spreadsheet with listing. I don't want 'the farm' for any but can't bring myself to throw them out. Will pack carefully: you pay postage and I will refund $ for tubes if any are no good. Please contact Frank Grimshaw 02 62557849 or email: *fgrimshaw@bigpond.com* for a copy of the listing. Thanks for looking. 73 Frank VK1VK.

Silent Key

David McKeough VK3AGE

David McKeough VK3AGE passed away late November 2014 after a short illness. David was the youngest of five children, brought up in the country towns of Cleve and Robe in South Australia. In 1964 he joined the Royal Australian Air Force as Radio Technician and served a total of 22 years, leaving in 1986. He then worked in the Information Technology field in the Department of Human Services in an IT Security position before retiring after twenty years of service.

He had a passion for sailing and this included many Melbourne to Devonport and Melbourne to Hobart yacht races and one Sydney to Hobart race in 1998. His sailing interests led him to holding the position of Commodore at Werribee and Williamstown Sailing clubs.

David's daughter Lisa described him as being passionate about everything he did, putting great effort into doing his best and getting a positive outcome. He

researched and planned, made notes and drew diagrams. He was an avid reader and visited the library weekly. David was also a gadget man, who couldn't resist searching the web looking for a part for a radio or latest camera or watch. David also loved to drive and undertook several countryside trips with his partner Liz. He also undertook several courses in retirement in Italian and Welding.

David joined the Geelong Radio and Electronics Club in July 2013. On joining, David commenced studying for his amateur radio licence and achieved his Advanced licence with the call sign VK3AGE. He attended many club meetings, Wednesday working bees and field trips. David was always ready to share his life experiences with the members especially from his days in the RAAF. He always seemed to have a humorous anecdotal story that was appropriate to the occasion.

David was in the process of building up his amateur radio shack over the last year and kept us abreast of all the things he had done. It is disappointing that he didn't get to enjoy the final fruits of his labours, but we believe he enjoyed his time at the club and achieving all that he did in such a short time in the hobby.

We at the club will miss David and we wish him 73 VK3AGE de VK3ANR.

John Forrest VK3JNF

Contributions to *Amateur Radio*

AR is a forum for WIA members' amateur radio experiments, experiences, opinions and news.

Your contribution and feedback is welcomed.

Guidelines for contributors can be found in the AR section of the WIA website, at *http://www.wia.org.au/members/armag/contributing/*

Email the Editor: *editor@wia.org.au*

About Hamads

- Submit by **email (MUCH PREFERRED)** or if written and mailed please print carefully and clearly, use upper AND lower case.
- Deceased estates Hamads will be published in full, even if some items are not 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 on these pages Contact admanager@wia.org.au
- Copy to be received by the deadlines on page 1 of each issue of Amateur Radio.
- Separate forms for For Sale and Wanted items. Include name, address STD telephone number and WIA membership number.

'Hamads'
PO Box 2042
BAYSWATER VIC 3153
hamads@wia.org.au

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 will appreciate the absolute need for themselves to ensure that the provisions of the Act are strictly complied with.

VICTORIAN CONSUMER AFFAIRS ACT
Advertisements with only a PO Box number address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

ADVERTISERS INDEX

Cookson Controls	63
Ham Radio House	13
Icom	BC
Jaycar	7
TET-Emtron	9
TTS Systems	11, 63
Yaesu	IFC

WIA Functional Committees

The WIA is a membership organisation with a very wide range of complex functions and member services. Core functions and services are administrative in nature (general administrative functions, membership services, examination and callsign management, financial etc...) and are performed by salaried staff.

Volunteers perform a diverse range of highly specialist functions (ACMA liaison, Frequency Co-ordination, Standards liaison, Interference issues, technical support and training and assessment etc.). These volunteers provide the majority of member services, however they have been loosely organised and often overstretched.

The new committee system attempts to structure the WIA's non-core activities into 10 broad functional areas, each comprising a team of volunteers under the direction of the WIA Board. This structure is intended to spread the workload on our volunteers, improve communications between members and the WIA Board, improve services to members, and encourage more people to become involved in the WIA.

WIA Committee Charters

Spectrum Committee

(Regulatory, ACMA, ITU, IARU, Repeaters & Beacons, Standards, Interference & EME, Monitoring Service)

Geoff VK3AFA, Phil VK2ASD (Director), Peter VK3MV, Roger VK2ZRH (Director), Brian VK3MI, Dale VK1DSH, Peter VK3APO, Richard VK2AAH, Gilbert VK1GH, Rob VK1KRM, Noel VK3NH, Doug VK3UM

- Perform all ITU and IARU liaison activities.
- Liaise with, and act as the 1st point of contact for, the ACMA.
- Advise the Board, and enact Board policy in relation to all radio communications regulatory issues and the LCD.
- Represent the WIA to State and Local Government
- Represent the WIA to Standards Australia
- Provide specialist technical advice and coordinate repeater and beacon licence applications and frequency allocation.
- Develop responses to significant and prolonged harmful interference issues affecting amateur radio operations.
- Provide an information resource for EMC/EMR issues.
- Administer the IARU Monitoring Service in Australia
- Provide a technical resource to other committees and the WIA Office.

Technical Advisory sub-Committee (Tech support, Band plans etc.)

John VK3KM, Doug VK3UM, Rex VK7MO, Paul VK5BX, Walter VK6KZ, Barry VK2AAB, Bill VK4XZ, Peter VK3PF, Paul VK2TXT, Peter VK1NPW, John VK1ET, Peter VK3BFG, Eddie VK6ZSE, Peter VK3APO

Administrative Committee

John VK3PZ (Treasurer), Greg VK2SM (Assistant Treasurer), David VK3RU (Secretary), Mal VK3FDSL (Office Manager), Phil VK2ASD (President), Chris VK5CP (Vice President)

- Responsible for the efficient and correct operation of the WIA office.
- Responsible for staffing and workplace safety.
- Provide a specialist administrative resource to the WIA office as required.
- Manage contractual agreements.
- Manage business relationships.
- Ensure compliance with the ACMA Business Rules
- Prepare yearly budgets
- Prepare quarterly financial reports for the Board
- Prepare independently reviewed YE financial reports and balance sheets for circulation to the membership prior to each Annual General Meeting.
- Manage insurances and to be responsible for currency of insurance policies.
- Maintain a complaints register.
- Ensure complaints are handled in accordance with WIA policy and any contractual agreements.

Communications, Marketing, Publications and AGM Committee

Robert VK3DN (Director), Phil VK2ASD (Director), Jim VK3PC, Graham VK4BB (Broadcast), Roger VK2ZRH (Director) Publications sub-Committee (AR Magazine, Callbook etc): Peter VK3PF (Editor AR), Peter VK3PH (Editor Callbook), John VK3PZ (Treasurer), Ernie VK3FM, Peter VK3AZL, Evan VK3ANI, Ewan VK3OW, Bill VK3BR

- Communication with members and the public:
- Communicate with the membership.
- Publicise WIA activities and initiatives.
- Develop strategies and resources for the promotion of Amateur radio to the public.
- Develop strategies and resources for the promotion of WIA membership to the Amateur community.
- Supervise and/or perform promotional activities.
- Co-ordinate the yearly AGM activities

Education Committee

Fred VK3DAC (Director), Owen VK2AEJ, Ron VK2DQ, Mal VK3FDSL (Office Manager)

- In association with the WIA's RTO and affiliated clubs offering training services, develop and administer the WIA's training and assessment systems.
- In association with the Spectrum Strategy Committee, develop and maintain the various licence syllabi and associated question banks.
- In association with the Community Support Committee and the RTO, develop and maintain the Emergency Communications Operator scheme.
- Ensure the confidentiality and security of all personal information, question banks and examination papers.

Radio Activities Committee

Chris VK5CP (Director), Geoff VK3TL

Contests sub-Committee

Alan VK4SN, Denis VK4AE/3ZUX, John VK3KM, Tony VK3TZ, Kevin VK4UH, Colin VK5DK, James Fleming VK4TJF

Awards sub-Committee

Bob VK3SX, Marc VK3OHM, Laurie VK7ZE, Alan VK2CA, Alek VK6APK, David VK3EW, Paul VK5PAS, ARDF sub-Committee: Jack VK3WWW, ARISS sub-Committee: Tony VK5ZA

- All activities associated with actual radio operation, such as: contests, awards, distance records, QSL services, ARISS, AMSAT, ARDF etc.

QSL Card sub-Committee

Geoff VK3TL, Alex VK2ZM, John VK1CJ, Max VK3WT, June VK4SJ, Stephan VK5RZ, Alek VK6APK, John VK7RT, Craig VK8AS

Historical and Archive Committee

Peter VK3RV, WIA Historian, (Leader), Drew VK3XU, Linda VK7QP, Martin VK7GN, Ian VK3IFM, Will VK6UU, David VK3ADW, Jennifer VK3WQ/VK5ANW, Roger VK2ZRH (Director)

- Develop, maintain and preserve the WIA's historical and archive collection
- Encourage access to the collection by WIA members and those seeking historical material for publication.

IT Services

Robert VK3DN (Director), Tim VK3KTB

- Provide an IT resource to other committees and the WIA Board.
- Be responsible for the off-site data back-up of all IT systems information.
- To update and maintain the WIA website as required.
- Advise the Administrative / Financial committee in relation to the MEMNET Cloud Service contract.

Community Service Committee

Fred VK3DAC (Director), Greg VK2SM (Assistant Treasurer), Ewan VK4ERM (Director), Paul VK5PH

- Develop, promote and co-ordinate all WIA community support activities

New Initiatives

Phil VK2ASD (Director), Robert VK3DN (Director), Roger VK2ZRH (Director), David VK3RU (Company Secretary)

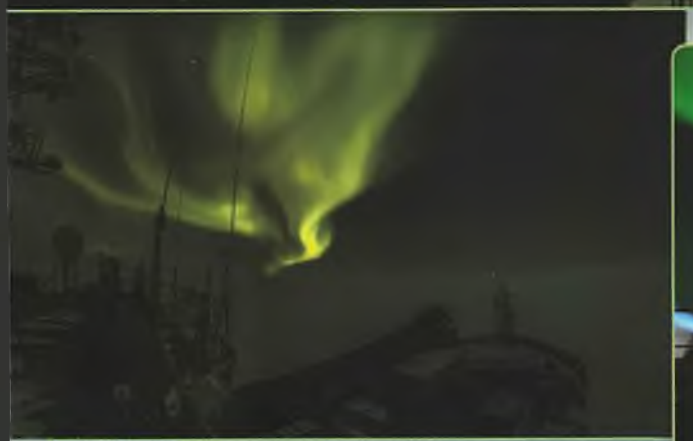
- Think-tank ideas and initiatives to advance amateur radio and WIA membership.
- On approval by the Board, run proof of concept trials.

Affiliated Clubs Committee

Ted VK2ARA, Mal VK3FDSL (Office Manager), John VK3PZ (Treasurer), Phil VK2ASD (Director)

- Manage all arrangements between the WIA and WIA Affiliated Clubs
- In cooperation with the Administrative / Financial committee, manage the Club Insurance Scheme
- Encourage stronger relationships and communications flow between the WIA and WIA Affiliated Clubs
- Encourage increasing WIA membership ratios in Affiliated Clubs
- Manage the Club Grants Scheme
- Identify and bring regional Affiliated Club issues to the attention of the WIA Board.

In the ice and beneath the aurora



On his way back home after a winter season in Antarctica, Craig VK6JJJ/VK0JJJ had experiences that many would envy: the harsh remoteness of the ship stuck in the ice, the rough ocean on the voyage home and the delights of the ionospheric display *Aurora Australis* whilst travelling aboard the ship of the same name. Photos courtesy of Craig VK6JJJ.

See the story beginning on page 32.

ICOM

IC-2730A

Introducing the new IC-2730A VHF/UHF dual band transceiver.

Featuring an easy-to-see white backlit LCD, optional Bluetooth and 50W of output on VHF and UHF, this amateur transceiver will take your communications to the next level.

To find out more about Icom's Amateur products email sales@icom.net.au

WWW.ICOM.NET.AU

ICOM1007