Amateur Radio

Volume 84
Number 8
August 2016
Price: $9.70 incl GST
www.wia.org.au

WIRELESS INSTITUTE OF AUSTRALIA

Radio active for ANZAC Day

Scouts and SARC join forces to involve youth

- Yaesu FTM-400XDR reviewed
- Build a butterfly capacitor
- Oz MDT kit transceiver review

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Volume 84
Number 8
August 2016
ISSN 0002-6859

Amateur Radio

The Journal of the Wireless Institute of Australia

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

General

Technical

This month's cover

The main photo shows part of the crowd watching a party balloon with its radio payload just after launch at the combined SARC and Scout event conducted in Melbourne on ANZAC Day. The upper inset image shows two of the SARC members building a simple electronics project. Photos by Julie Gonzales VK3FOWL. See the story commencing on page 17.

Columns

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).

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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.

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ABN 56 004 920 745

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Editorial

Peter Freeman VK3PF

anchora imparo

Those that have been involved in education, especially at the tertiary level, may recognise the term *"ancora imparo"* as part of the "brand" of Monash University. It is commonly interpreted as meaning "I am still learning", "Still I am learning" or "Still I learn". Yes, I am a graduate of Monash University and was an employee for many years, but those facts are not directly relevant here.

So why begin an editorial with some Latin interpretation? I believe that as radio amateurs, we all must embrace this phrase. After all, part of the definition of "amateur radio" includes reference to self education! Be it learning the material and skills required to display competency for the Foundation licence, or discovering the intricacies of techniques for our explorations into a new aspect of the hobby; even if we simply choose to purchase a stack of equipment, we must learn something that extends our pre-existing knowledge, thus we learn something new, if we are to transform that collection of equipment into a functional station.

Of course, many of us really do extend our knowledge as we explore aspects of our hobby. Some assist newcomers to the hobby as trainers and assessors. Many pass their learnings on to others through talks to their local club members at formal meetings or informally through mentoring club members.

A few assist the learning of others by contributing technical articles to this journal. Most of us learning through exploring material published in the various amateur journals, handbooks and the vast amount of information published on the web. We must learn to distinguish good information from the not so good, especially if browsing the web – we must develop the skills to distinguish quality material from that which is of poorer quality. This is often very difficult.

Our recent technical forum following the WIA Annual General Meeting saw several amateurs sharing their knowledge with other amateurs. The response from the audience members was the same as at most, if not all, similar events: appreciative of the efforts made by the presenter. Be it Club meetings or conferences, most amateurs in the audience find something of value, some new learnings, from the presentations made by the contributors.

Many such conferences around the world make the information available to those that could not attend the actual event. Perhaps by publishing printed or web-based Proceedings, or placing video on the web, perhaps via YouTube. Even if such Proceedings are not available, many of the speakers make material available for those interested. All of this requires considerable effort by the presenter and/or the event organisers, all with the goal of educating other amateurs. I trust that you all appreciate those efforts!

I prepare this issue of *AR* in the days following the annual GippsTech conference. Over 100 amateurs spent the weekend engaging in learning from fellow amateurs who were willing to share their knowledge. Along the way,

Continued on page 3

WIA comment

Phil Wait VK2ASD

Ideas from Paradise

At the WIA's Open Forum this year on Norfolk Island, which immediately followed the AGM, there were a number of good suggestions with the potential to increase membership and to improve the WIA's financial position.

Both these issues are of intense and current interest to the WIA Board as, like most other community organisations with an aging membership profile, we find ourselves in a period of rising costs, rising member expectations, and slowly declining membership numbers.

I expect to have more to say about those issues and the WIA's financial outlook next month, but for now, let's concentrate on two suggestions from the Open Forum: the ability to opt-out from receiving the paper copy of *AR* magazine; and free WIA membership to new radio amateurs for a limited period.

It appears that many WIA members do not read the paper copy of *AR* magazine now that the digital version is available. On a show of hands at the Open Forum, about 40% of attendees indicated that they do not read or want to read the paper copy of *AR*, and would be more than happy to only receive the digital version that they download from the WIA website. Importantly, most also indicated that they would not expect a membership fee reduction as a consequence. Clearly, 40% is a high number, and in the wider membership that figure is more likely to be around 20%, but even if only 20% of members chose to opt-out of receiving a posted paper copy of *AR* magazine each month, the saving to the WIA in postage alone would be about $15,000 per year. That single initiative could wipe out the type of operating deficit we experienced in 2015.

The Board is considering how such a paper magazine opt-out scheme could be put in place. We can commence the *AR* digital-only immediately, but will announce the initiative and then request members email the Office to take up this offer.

The second suggestion was about how to encourage a greater number of new radio amateurs to join the WIA when they enter the hobby. This issue is more complex, and there could be unintended consequences to the WIA's income and costs.

The proposal was to give one year's free non-voting Associate WIA membership to all new radio amateurs, with access to the digital-only edition of *AR* magazine, not the paper edition. Prior to the expiry of the free period, each Associate member would be contacted and "encouraged" to renew their WIA membership at the normal membership fee.

The advantage for new amateurs is that they can get involved in their representative organization quickly, without the additional burden of forking out another $95 after having just spent hundreds or possibly thousands of dollars gaining their licence and callsign, buying equipment and getting on-air.

The advantage for the WIA only comes if those people choose to follow-on and become full-paying members. The unintended consequence of this suggestion is that: (1) new Radio Amateurs who would have joined the WIA and paid the membership fee, will now delay joining until after the free period, and (2) there would be increased administrative costs to the office in setting up a free Associate membership and then cancelling it at the end of the free period. These costs have to be weighed against the potential for increasing the number of full fee-paying members in the longer term.

The WIA Board is investigating the effect of the free initial membership suggestion on the WIA's finances.

Currently, the WIA sends promotional material to new licensees, and some do join the WIA at the time, though it seems the 'strike rate' is not high. This is understandable, as they're keen to make the most of their time, effort, emotional and monetary investment and the first instinct for most is *"why do I need this?"* To encourage new members, the Board is considering including a membership application in an envelope with the examination material so the new amateur will be able to take this away at the end of their exam.

Another suggestion is that, instead of giving away free WIA Associate memberships, we simply give free access to the digital edition of *AR* magazine for a limited period. That would allow new amateurs to become familiar with the WIA and the Club network and, as it could be an automated process, it would certainly reduce the administrative overhead.

So, we have a couple of good suggestions from the WIA's Open Forum. There were others, such as improving youth participation

Continued on page 5

WIA news

The WIA AGM video online

The recording of the Wireless Institute of Australia annual general meeting held at the Paradise Hotel, Norfolk Island, is available for WIA members. Access is available to WIA members who are registered with the Memnet membership service, and the video had almost 300 views in the first 24 hours after it went up on Sunday June 19.

A LiveStream server and dedicated Internet service were used to stream it in real time from the AGM, and 150 members from all parts of Australia were watching.

Some people have commented that they could not view the original LiveStream at the time, but have viewed the video later from the WIA website. One member said: "well done, this is exactly what the WIA needs". Another described it as being a great idea, which showed the WIA as being professional and transparent.

The WIA Board has received favourable comments about this use of the technology and has resolved, where possible, to stream future Annual General Meetings.

However there is really no substitute for actually attending an AGM weekend. The AGM is much more than just a corporate meeting. Those attending get to be part of the Open Forum where ideas are raised, and during the Saturday afternoon there are speaker sessions on various topics.

This year speakers covered portable amateur radio, the future opportunities with STEM, chasing storms, history and DXpeditions.

The traditional WIA annual dinner on Saturday night is a must and there is also a lot of Amateur Radio, general tourism and social activity.

The WIA Board has decided that the 2017 AGM will be held in Adelaide. Don't miss it. More details on it later this year.

WIA Director gives presentations in South Australia

The Wireless Institute of Australia is making presentations with the latest being at the South East Radio Group Queen's Birthday annual convention and National foxhunting championships.

This followed WIA Directors at club meetings or events in Queensland, New South Wales, Victoria and Western Australia.

The Brisbane Amateur Radio Club BARCFEST on 4 June saw Director Ewan McLeod VK4ERM there, and he will be presenting at the Townsville Amateur Radio Club on June 21.

Director Andrew Smith VK6AS is to be at the Northern Corridor Radio Group Hamfest on 7 August. He intends to visit other VK6 clubs during the year.

In October, Director Fred Swainston VK3DAC will be the Tablelands and Cairns Amateur Radio Clubs.

Last weekend WIA Director Paul Simmonds VK5PAS gave a presentation in Mt Gambier before about 75 that was generally well-received.

In fact, this is the second time such a WIA presentation was given by him, the earlier occasion was to the South Coast Amateur Radio Group on 9 June.

Paul VK5PAS combined his WIA duty with portable visits in parks, that this time included dodging a few kangaroos on the road.

Reforms to the Malaysian licence system

The Malaysian Amateur Radio Society (MARTS) has advised that the Amateur Radio certification review was showing some positive future changes in that country. In the new structure there would be three classes of licence, namely Class A that give 1 kilowatt on all bands with upgraded privileges, Class B has most HF bands at 50 watts, and the new entry level Class C gives access to 2 m, 6 m and 70 cm.

The Morse code proficiency tests of 12 word per minutes that currently apply to the Class A, or top licence, will be removed.

In other news, the minimum age to obtain the Class A will be 15 years, with Class B the middle class licence at 15, and Class C will be at 12 years.

When these changes will take effect is not known, but will follow the normal drafting process for all new rules.

Foundation licensee twice recognised for achievements

A radio amateur has qualified for a Keith Roget Memorial National Parks Award ultimate - all 45 VK3 National Parks worked.

Adrian Addison VK5FANA has qualified for the Merit Hunter Award, with his plaque and certificate in the post.

Award Manager, Tony Hambling VK3XV, described it as outstanding effort, having begun in December 2014 with Julie VK3FOWL in the Coopracambra National Park in Eastern Victoria.

The final contact in April was with Rob VK4AAC portable 3 in the Burrowa-Pine Mountain National Park in Victoria's north-east.

Rob VK4AAC is caravanning around Australia with his XYL and a keen park activator. Adrian VK5FANA was given a WIA President's Commendation at the Norfolk Island AGM for his wholehearted participation in the ANZAC Centenary Award, completing contacts with ANZAC stations across all States and Territories, and ZL100ANZAC.

WIA comment

Continued from page 3

through the WIA's involvement in science, technology and maths vocational training STE(A)M education initiatives, and the production of special subject magazines (termed one-shots in the industry). In this regard, the WIA is already advanced in the production of an ANZAC one-shot for release later this year.

One thing is for sure, we need to increase the income to the WIA and finesse the expenditure. That invariably means having more attractive offerings, and simplifying processes and systems, wherever possible. In my view the suggestions from the Open Forum would be a step in the right direction and worthy of thorough consideration. To be continued....

PS: Don't forget that you can pay your membership fees in quarterly instalments, if that would make things easier, and to all those racing yachties out there – be very careful of the big rock off Edwards Beach in Middle Harbour... ouch!

Phil Wait VK2ASD
President

Editorial

Continued from page 2

we had far too short opportunities for social interaction and further technical discussions. From the comments that I heard, everyone enjoyed the event, including those that participated on the partners' activities.

I extend a huge thank you to all involved in organising, running and presenting at such events: a conference, a club meeting talk, a Foundation or upgrade course. You all are playing very significant roles in helping other amateurs to extend their knowledge, thus helping us all to continue learning.

Until next month,
Cheers,
Peter VK3PF

Wanted

Articles and high quality photographs for *Amateur Radio* and *Callbook*.

See *http://www.wia.org.au/members/armag/contributing/*

The Oz MDT DSB QRP Transceiver Kit
A User Review

Peter Parker VK3YE

Photo 1: Front of MDT.

About three years ago we reviewed the MST400 DDS-controlled 7 MHz SSB transceiver kit from Oz QRP. This was a low-cost short-form kit pitched at advanced constructors willing to hunt for parts. Then came the MST2 series with more supplied parts and available bands. It remains a current model with many built worldwide.

The MDT, or Minimalist Double Sideband Transceiver, is the latest from Oz QRP. With a direct conversion receiver it puts out nearly 2 watts of DSB in a popular section of 7 MHz. It comes as a full kit, including box and knobs. About the only extra you need is a microphone, which can be a cheap electret insert.

Fewer parts and a lower price make it more suitable for the less experienced builder than the MST2. While still not what I'd call a first kit, it would be logical next step if you've successfully built simple kits like the $10 eBay Pixie or variants. It should take a couple of nights to properly build and test.

Does double sideband and direct conversion work?

As mentioned, the MDT transmits double sideband. How effective is this on HF? The first thing to clear up is that the DSB produced by this and similar homebrew designs is double sideband *suppressed carrier*. It's not conventional AM, which is double sideband *full carrier*.

DSB suppressed carrier is 3 dB less efficient than SSB because the unwanted sideband hasn't been suppressed and the bandwidth is double. However it's more efficient than AM because there's no carrier. The wider bandwidth is unlikely to interfere with others if a clear frequency is selected. In any case you'll suffer more interference from other stations than they will from you due to their likely higher power and your less selective direct conversion receiver.

I've made hundreds of 7 MHz DSB contacts using QRP equipment similar to the MDT. Provided you're on frequency and your transmission is clean, stations worked won't know you're DSB unless they switch sidebands. Some suffer local noise but plenty more will hear you, even if 1000 km away. QRP DSB is both practical and satisfying with contacts possible almost every time you turn on.

Circuit description

Key stages of the MDT include: 7.2 MHz ceramic resonator VXO and buffer (two transistors), Product detector/Balanced modulator (four diodes), Receiver RF preamplifier (one transistor), Receiver AF filter and amplifier (two ICs), Audio muting (one transistor), Microphone amplifier (two transistors) and RF driver and power amplifier (three transistors). A relay controls the transmit/receive switching.

Except for two audio ICs, all active parts are discrete transistors. All components except one are through-hole mounted. The one that isn't - the varactor diode - is supplied pre-soldered to the circuit board. Because most of the sockets and controls are board-mounted, there is little extra wiring once the circuit board has been populated.

The VXO provides the means of frequency control. The 7.2 MHz ceramic resonator used is like a crystal but can be pulled over a wide range if a variable capacitance is connected in series. The MDT uses a varactor diode to vary the capacitance according to the voltage supplied by it by a potentiometer which acts as a tuning control. The varactor diode has two sections, like a dual gang variable capacitor. Switching them both in allows a lower frequency range, and more of the band to be covered.

A single tuned circuit provides some selectivity ahead of the transistor RF amplifier on reception. While not strictly necessary in a 7 MHz transceiver, RF amplification provides adequate gain if using very small antennas such as magnetic loops. It also lessens the audio gain required and the risk of microphonics (none noted).

The product detector, which doubles as a balanced modulator on transmit, has few components but involves coil winding which some may find fiddly. This is critical to the success of the project and the correct windings need to go into the correct holes in the circuit board.

The audio stages provide a mix of gain and low pass filtering. This is particularly important in a simple direct conversion receiver because audio bandwidth determines selectivity.

Two transistors amplify the audio from the microphone to drive the balanced modulator. This effectively impresses the audio on the applied carrier signal, producing a 7 MHz DSB signal with a nulled out carrier.

The transmit RF amplifier stages provide about 1.5 to 2 watts DSB from the low level signal present at the balanced modulator. Both driver and power amplifier stages use cheap and common BD139 transistors.

The latter has two in parallel with individual emitter resistors to limit current and afford protection.

A low pass filter in the antenna line cleans up the transmitter's output and adds receiver front-end filtering. The free end of this filter is switched by the DPDT transmit/receive relay which also switches power between some stages. Simple transceivers can have an annoying clunk in the headphones between transmit and receive. The MDT has a muting transistor in the audio chain and no clunk.

All parts are mounted on one circuit board which appears to be of excellent quality. The use of board mounted sockets minimises additional wiring. The board fits in a compact plastic case with professionally printed front and rear panels.

A comprehensive 42-page manual is available at *ozqrp.com* so would-be builders can check the kit is suitable before purchasing. This is a high-quality production, with many photos, diagrams and schematics.

The review unit was sent pre-built, so I cannot comment on how it went together. However if built as described, you will end up with a professionally-working and looking unit as the tests and pictures demonstrate.

Testing

I did the following tests. Most need little or no other equipment to perform and apply equally to any other transceiver you're thinking of buying.

Receiver sensitivity: Good. The receiver was taken to a quiet beachside location. A wire antenna was plugged in. The significant increase in noise indicates sufficient gain and sensitivity.

Selectivity: Limited by the direct conversion technique but adequate for casual operating. Effective audio filtering with roll-off below 300 Hz and above 3 kHz

Receiver audio quality: Good headphone and speaker volume.

Receive current consumption: Low. A fraction of any premade voice rig. Very suitable for SOTA and hiking where heavy batteries can't be carried.

Frequency range: Covers two overlapping ranges: 7.050 – 7.110 and 7.090 – 7.130 MHz selectable during construction. Modification to tune the whole range is discussed later.

Frequency stability: Some drift but barely noticeable. No microphonics observed when cabinet thumped.

Ease of tuning: Sufficient with practice. Fitting a larger knob makes tuning easier.

Dial readout: Hand calibrated by builder. Care is required to get more than 5 – 10 kHz resolution.

Transmit power output: As specified.

Transmit audio quality: Good with the test microphone supplied.

Photo 2: Inside MDT, showing circuit board.

On the air

I tested the MDT from home and away using both dipoles and end-fed wire antennas. A similar homebrew DSB transceiver provided a reference for comparison on some contacts.

The first thing noted was its compactness. It's a little smaller and much lighter than the Yaesu FT-817. This, plus its low current consumption, makes the MDT highly suitable for hiking and backpack operating, perhaps more so than the larger and more sophisticated MST series.

The MDT was a pleasure to use. The receiver was lively, stations contacted reported good transmitted audio and the transmit/receive switching was smooth. Over 20 stations in six call areas were worked in two days of casual operating with 2300 km the furthest distance. Most reports were

readability 5. Don't expect DX, but don't rule it out either under good conditions.

Enhancements

One advantage of a kit that isn't too miniaturised is the ease of adding extra features.

While the MDT offers a practical balance between simplicity, cost and performance, there were a couple of additions that I'd have liked.

More frequency agility means more contacts as you can search and pounce more wanted stations. It would have been nice to have both tuning ranges without opening the case. Luckily the varactor diode is just behind the front panel and there's room near the microphone socket to add a subminiature SPDT switch to change ranges.

End-fed half wave wire antennas are a popular portable choice because they're easy to erect. Unfortunately they need an antenna coupling unit which adds to station bulk. The MDT should have enough rear panel space to add an internal coupler comprising of a variable capacitor, inductor and binding posts if desired.

The MDT has no on-off switch. There's space on the rear panel if one is desired. The hardest part is finding the right place to break the circuit between the power socket and the rest of the transceiver.

While the MDT's frequency range does not include the CW end of the band, there may be circumstances where you need CW to pass a message under bad conditions. A DSB transmitter can be modified to transmit CW by applying keyed DC to unbalance the balanced modulator and tuning 1 kHz low when transmitting.

The receiver has no AGC. A good plan is to tune the band with the volume set so low that band noise is only just audible. This reduces the loudness shock when a local comes on if wearing headphones. Numerous audio ACG circuits are available on the web and there should be room to add if required.

Conclusion

The MDT is highly recommended for the intermediate level constructor who has built a couple of simple solder kits. Once finished, you'll have a compact portable DSB station capable of contacts near and far. The $79 price (at the time of writing) represents excellent value as you'd be unlikely to find the parts on their own for less.

Further information (including the assembly manual) can be found at *ozqrp.com* while video demonstrations appear at *youtube.com/vk3ye*. Thanks to Leon Williams VK2DOB of *ozqrp.com* for supply of the review unit.

A simple butterfly capacitor for a magnetic loop

Ron Holmes VK5VH

Being interested in small antennas I wanted to try a Magnetic Loop, particularly to see how it operated in comparison with my "Shack in a Brief Case" antenna. (See *AR* July 2002 or Google it: You will need to click "Read the full story"). I keep a much simpler permanent version in my shack and switch over to it occasionally. Most are amazed at the reception they get from a one metre long indoor antenna. Especially, may I remind you, one which can be tuned for operation on 11 different amateur bands. Generally speaking, with the magnetic loop, you have to make a different antenna for each band and find a pretty special kind of variable capacitance to tune it! My Mini Antenna has no tuning capacitor at all.

But to return to our main subject: The usual tuning condenser (capacitor), even if it has the wide-spaced plates necessary, has some kind of sliding connection for the movable plates. About the only kind that does not is the 'butterfly' type. Here there are two sets of fixed plates opposite one another, so shaped that a central revolving set of plates shaped like the wings of a butterfly, can revolve in and out between the fixed plates and vary the total capacity. The connections are only to two fixed points. *See Photo 1.*

Photo 1: Tuning capacitor.

I have entitled this article 'A **simple** butterfly capacitor for a magnetic loop'. If you happen to be an engineer, or have a kind friend with an engineering workshop, or enough money to buy the ideal thing from Russia, you won't be too interested in this one. But if you would really like to make a magnetic loop, and are just an amateur in this area like myself, you may be. My model was made with an electric drill, a large soldering iron, a cheap hacksaw and a file – (by an old bloke of ninety). It has only two fixed plates each side and one revolving one between them. But as the operative plates form a circle approximately 14 centimetres in diameter there is ample capacity available. It tunes from 7.00 to 7.180. *See Photo 2.*

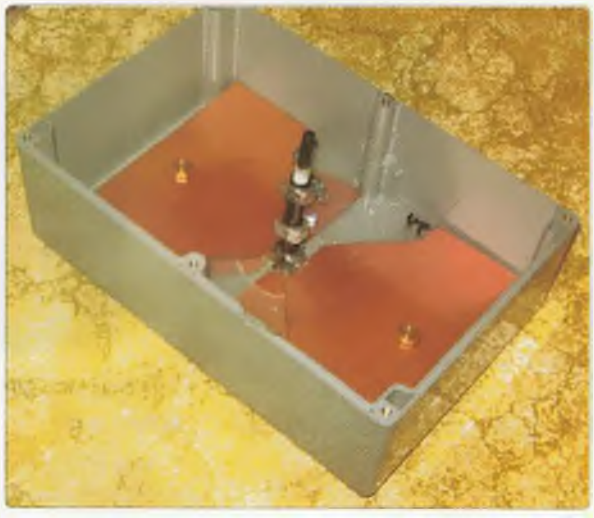


Photo 2: Inside the box.

When I first began tests I was concerned that it was rather sloppy in use. The same spot on the dial does not always bring up the exact same frequency. No engineer would allow that, but then, I don't suppose an engineer would be satisfied with the moving plate being attached to the dial with parts of an old Bic pen and a large knitting needle. Anyway, I pulled it to bits and made sure everything was tight. Then I discovered that it moved overnight without me tuning it at all. Discussion with other hams assured me that weather conditions etc. can have a considerable effect on such a tightly tuned antenna.

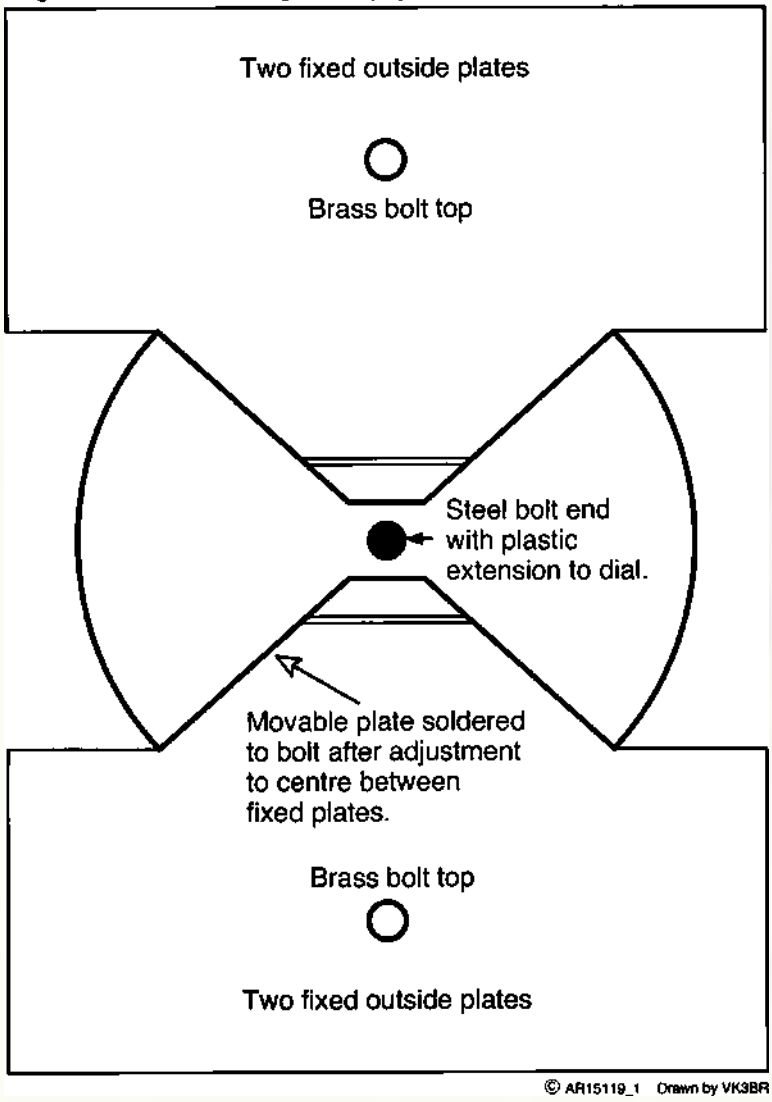
While I am in confessional mood, I should admit that having made this capacitor with double sided circuit board; after reading the article by Peter Parker VK3YE in the November 2014 issue of *AR*, I think I would have done better with single sided. I had to put a piece of clear plastic either side of the central moving plate to make sure it did not short to the fixed ones. Three levels of single sided with the copper side up would have overcome that problem; and been cheaper! (I recommend reading his article if you have it available.) But I already had everything cut and mounted so it was too late. I did, however, utilize his scheme of using RG213 Coax as an additional capacitor so that the three metres of copper tubing I had already bought, with a view to making a 20 m antenna, would work on 40 metres instead of 20. These days I prefer 40 m to 20 m since high antennas and high power are no longer available to me.

I do not intend to go into detail

regarding construction. The photos and a basic drawing is enough because you may have better ideas of construction than I did, and the exact kind of project box you build it into may vary. Mine was one which could be sealed and was 220 mm L 160 mm W and 80 mm H. It is mounted on its side with the lid as the front. On this I mounted an old Vernier dial from the junk box, standing out from the front so that I could operate the grub screw without needing a hole in the box big enough to see what I was doing. See *Photo 3* and *Diagram 1*.

Photo 3: My project box showing grub screw.

Diagram 1: Outlines showing butterfly system.



The back of the box is shown in *Photo 4*. The brass bolts and nuts which hold the fixed plates in place become the connections to which the large size coax soldered to the ends of the main loop is connected. The fixed plates are held apart by brass nuts. You buy them separate from the bolts where I shopped. A few washers may help with adjustments. Brass bolts and nuts may take some finding. For the rotatable plate I used an ordinary steel bolt poked through from the back. It was easier to solder the movable copper plate to it.

Photo 4: Back of the box.

The other end of the bolt is connected to the vernier dial with non - conducting material.

Tests are made to determine the right length of the large coax used as a fixed capacitor. A transceiver is attached to the feeding loop mounted inside the bottom of the main loop.

See Photo 5. You listen to where band noise peaks without the tuning capacitor connected. Start long and cuts bits off until, for a 40 m antenna, this peaks at just below 7 MHz e.g. 6.9 MHz. You are now ready to attach it to your capacitor. Then, with the moving plate fully engaged between the fixed plates, you should be at the bottom end of the band. As it is turned to full disengagement the tuning will go to higher frequencies.

As far as results are concerned so far, it is not nearly as good as my Stealth Antenna with Wings but possibly a bit better than my Mini Antenna. However, this article is not so much about the magnetic loop as the tuning capacitor.

In *photo 5* you will notice that the normal coax line to the feeding loop has a coil wound in it as an RF choke. This is because I made initial tests using the FT-100 transceiver from my 'Shack in a Brief-case' (see above). It was one of the first really small all band transceivers. When I originally made the mini antenna (about 15 years ago) it worked OK on my main transceiver but on the small one I could not get the SWR down. Yaesu told me to put that RF choke in and it fixed the problem. I found it was not necessary on my FT-897D.

In fact it worked better without it. I only mention this because someone may be trying to use one of the early models with a tightly tuned antenna and having unexplained trouble.

Photo 5: Ron showing his magnetic loop.

Apart from the fact that returning to the same spot on the dial won't always bring you to the same frequency, as previously mentioned it seems to work quite well.

Finally, there is a lot of material available on making magnetic loops. My contribution is just a way of making a butterfly capacitor cheaply and easily.

Participate

Remembrance Day Contest 13-14 August 2016

ALARA Contest 27-28 August 2016

Antennapalooza 2016

Ian Jackson VK3BUF

Photo 1: An overview of the Antennapalooza site.

Antennapalooza may not sound like a real word, but this recent event was the third of its kind and now the title has taken on some substance.

In essence, Antennapalooza has been a gathering of radio enthusiasts from various clubs on the Eastern side of Melbourne. For an entire weekend an otherwise empty paddock is transformed into a playground for testing antennas, putting out a few calls, barbecue meals, indulging in a few light lectures and partaking in refreshments around a campfire.

Hosted by the Gippsland Gate Radio & Electronics Club Inc, the event was staged in Drouin West in 2013, 2014 and now in March 2016. This year the GGREC extended an Antennapalooza invitation to members of six surrounding clubs. There were no bookings required and no fees charged. Participants simply showed up for the day or the weekend with tents and caravans and either setup their own antennas or helped others to put their stations together. A central tent was erected to provide free coffee refreshments and barbeque facilities for the visitors. This same tent was also the focus of several short lectures. The aim was to encourage discussion on antennas and technology that would take full advantage of the open space around the camp.

Each year has highlighted a different theme. In 2014 modulated light beam experiments were conducted using equipment on loan from Eastern Zone ARC members. We established a night time LED light audio link between the event site and a hilltop 3.5 km away.

(A *You-Tube* video of that event can be seen on the web. Just search for *Antennapalooza*.)

Our main feature for 2016 was the trial of a temporary rhombic

Photo 2: Mark VK3OHM describes the SARK antenna analyser.

antenna erected for the 40 metre band that was spread out over 3 acres. Another highlight was a lecture by Marc VK3OHM of the EMDRC, who spoke about the SARK antenna analyser, using a PC notebook and video projector hooked up to a small inverter. Mark provided an analysis of an off-centre fed dipole set up for this purpose.

Roy VK3GB from FAMPARC spoke on the attributes of different styles wire antennas and effectiveness of ground earthing systems.

On the Sunday visitors learned about WSPR communications from Phil VK3YB. This was followed with a discussion about ideal DXpedition antennas with Chris VK3QB.

Later, Rob VK3BRS examined the equipment that makes up the GGREC portable field kit.

Photo 3: Mike VK3KTO, Bruno VK3BFT and Bruce VK3BRW stand up a Rhombic in a mini cyclone.

Photo 4: Ian VK3BUF preparing the 12 metre antenna poles for the rhombic.

The final attraction was an up-close look at a Humvee military vehicle that had seen service in the Middle East. It was equipped with original communications gear and an imitation Browning machine gun that mounts above a rotatable gun turret. Nowadays this machine only sees service in movies and weddings.

The Drouin West site is in an undulating valley out of sight from passing traffic and adjacent property owners, about an hour of drive time to the East of Melbourne. At only 100 metres above sea level, it's not the greatest VHF location, but the HF noise level in the area is quite low.

This year the *Rhombic* demonstration antenna presented some extra challenges for the setup team. The antenna consisted of some 300 metres of wire in a large diamond shape atop four 12 metre high posts. They had been erected on the preceding Thursday by volunteers working under a hot sun. The masts were made from two stacked lengths of 90 mm plastic downpipe, guyed with nylon rope at two levels. These sections

were placed with the help of a 14 m boom lift. This light and low-cost configuration is quite able to withstand winds of around 70 kph. Unfortunately, on the Friday before the event, a big storm came through with gusts of 80-90 kph and dropped two of the posts. The plastic literally shattered under the intense broadside wind pressure.

The storm also shredded one tent, dropped a sizable clump of foliage on a camper and blew over an (occupied) toilet cubicle, despite being pinned down by star pickets.

When the wind and rain dropped sufficiently, four more $16 pipe sections were purchased and the poles were repaired. Unfortunately another storm cell drifted over an hour later and more 90 kph gusts dropped a few of the 12 metre masts a second time, complete with rain and hailstones.

It was most unpleasant and a total contrast to the weather of the previous day. Fortunately, the weather on the Saturday, the first official day of the event, was quite mild. Three more pipe sections were installed and the rhombic antenna was erected a third time without incident. Electrically, the antenna was made from spans of copper coated MIG welding wire, an 800 ohm terminating resistor and a 4:1 coax balun at the feedpoint. The MIG wire is thin at 0.9 mm, but is very strong, with a breaking strain of about 80 kg. This type of wire is also a cheap commodity for antenna work. A thirty five dollar,

Photo 5: The completed 12 metre high rhombic antenna on 40 metres (wire radiator enhanced for clarity).

15 kg spool contains over 3 km of wire in a single length. There was enough diagnostic material on this demo antenna to warrant a separate article, but here it suffices to say that the VSWR was extremely low and flat over much of the HF spectrum, making it an interesting multi-band antenna to play with.

Laying out such a large antenna was made easy by mapping it out in advance on Google Earth. The Google measurement tool turned out to be surprisingly accurate when compared with a distance measurement wheel at ground level. The Google Earth error was within 200 mm of physical measurements made with a tin of line marking paint, measuring back from fence lines. It is worthwhile bearing this in mind when designing any large antenna.

The actual rhombic station at the feedpoint wasn't really planned. It just sort of came together. The moment the feedline was hoisted, a HF rig and battery appeared on the mudguard of the boom lift. That put us on the air. A 3 x 3 metre shelter marquee was placed over the top of this. A plastic table and some chairs showed up. Then more batteries, a string of LED lights, packets of chips, liquorice allsorts all rapidly materialised. Suddenly we were logging John Moyle contest contacts with strong signals into VK4. More people drifted over from the campfire, along with a few quiet drinks. Later an MDT 40 metre kit transceiver was applied and some good QRP contacts were logged.

That night a notebook PC and matching transceiver were hooked up and we let the system run for a while on a WSPR communications program. (Weak Signal Propagation Reporter) The results of this became a topic of a lecture on the Sunday morning.

Deliberately so, the entire weekend is a very informal gathering. Talks were preceded by a four second blast of an air horn, with most lectures only lasting for half an hour. Often eskies filled

Photo 6: Using Google Earth is a great way to map out large antennas.

in the gaps between the chairs to provide essential nutrients for the audience. Between talks, a lot of time was spent wondering from camp to camp checking out different methods of setting up portable stations.

Late into the night chairs were dragged up to the campfire and listened to a little background music provided by Graeme VK3XTA with his generator powered entertainment system.

After the rough start, the weather this year was quite pleasurable. The nights were clear and once one stepped away from the fire, a waxing gibbous moon was there to illuminate the rolling hills of West Gippsland.

Antennapalooza 2016 was a successful event, made possible by funding by the GGREC, the extensive support from its members and the camaraderie of visitors from several local clubs.

All who attended have voiced their intention to be there again next time.

The important lesson here is this kind of event can be replicated by other clubs in different parts of the country. Hamfest sales will always be an important part of amateur radio culture, but unlike radio sales, antenna weekends are easy to stage and provide a relaxing atmosphere to break down the isolation between neighbouring clubs. In short, it encompasses all the best parts of amateur radio.


Photo 7: Chris VK3QB inspects a classic 6.2 litre Humvee with a (replica) Browning machine gun.

2016 ANZAC Day Amateur Radio Special Event

Julie Gonzales VK3FOWL and Joe Gonzales VK3YSP

Photography by Ben Gillies, Tricia and Deanna Taylor.

Photo 1: ANZAC Day Amateur Radio Special Event.

The School Amateur Radio Club Network and the Melbourne Region Scouts joined forces to present their inaugural ANZAC Day Amateur Radio Special Event at the 1st Bentleigh Scout Hall at Victory Park in Victoria.

The all-day event was attended by some 200 school students, Scouts and their families.

Highlights of the day included a high altitude balloon launch, a very moving ANZAC day ceremony and many radio-related activities and displays. The progress of the balloon, which was tracked by local amateurs, was closely monitored by the children on their mobile devices. The electronics soldering activity, first aid - CPR demonstration and a historic WW2 radio display also attracted a lot of attention.

The concept for the event grew out of the author's experience with the annual Jamboree On The Air (JOTA). Last year they teamed up with Murray VK3MJT, the Melbourne Region Cub Scout Commissioner, to present a JOTA experience at the 9th Caulfield Scout Hall in Murrumbeena. Murray's idea was to get neighbouring Groups that were not planning their own JOTA event, to come along and experience it for themselves. The plan worked a treat with many other Groups attending.

Photo 2: First Aid CPR activity.

A review of that event with local Scout leaders revealed the need to have more than one JOTA-style event during the year so that the preparations and skills required would remain fresh. But when and where would it be held? It wasn't until April this year that the right opportunity presented itself.

The authors were keen to have their three primary school Amateur Radio clubs participate in the 2016 Global Space Balloon Challenge - The annual event where some 300 teams around the world launch and track high altitude balloons, apparently just to "celebrate an age where anyone can reach the edge of space". However, the official launch window for that event was less than 30 days wide.

Building *three* amateur radio balloon payloads and launching them

Photo 3: SARC Electronics Team.

in that timeframe would be no mean feat as others involved in the hobby can attest to. And the launch should be more of a spectacle than an unceremonious release from the boot of a car. So there was a real need to bring the three schools together, on one day, at a nearby park. But that would require a weekend event, on or around ANZAC day, and some serious logistics.

As is their forte, the Scouts came to the rescue: Murray was on-board immediately; we surveyed seven parks, chose one and had local support from James and the Leaders of the 1st Bentleigh Rovers, Scouts and Cubs the next day. Scout leaders from the Glen Eira Stonnington District met with us to help iron out the details.

There followed advertising on school and Scout websites and newsletters. WIA bulletins and broadcasts were made assisted by Jim VK3PC and Graham VK4BB. A new callsign "VK3SRC" for SARCNET was processed by Petra in the WIA Melbourne office. The Scout Radio and Electronics Service Unit provided their own callsign "VK3SAA" for the Scouts to use.

The morning of ANZAC day arrived and by 9am many young wide-eyed visitors and their families started arriving. Some had come straight from the local dawn service. The Scouts came in uniform and, not to be out done, the SARC kids donned their own fluorescent yellow safety vests. When they entered the hall they all saw an array of well-prepared activities and demonstrations.

First up were Pete VK3HEX and Kerry from First Aid Training Group. They provided a great hands-on CPR demonstration teaching real-life skills. Sadly, none of their rubber patients ever regained consciousness, but we all learnt the correct number of compressions and breaths required in an emergency.

Next was Julie VK3FOWL with the SARC electronics team. They were testing components, bread-boarding circuits and soldering kits like experts. Their "Hypnotic Owl"

Photo 4: MDRC historic radio display.

Photo 5: Scout heritage display.

Photo 6: HAB development display.

project with flashing blue LED eyes was a big hit and many children, who had never soldered before, sat down and gave it go.

Then there was Colin VK3UDC and Ron VK3AFW from the Moorabbin and District Radio Club who set up an excellent historic radio display. There was an array of radios used by Australian troops during WW2 including an AR7 communications receiver, a Type 108 backpack and a Type A MkIII suitcase spy radio. Ron was also kept very busy giving CW demonstrations to a fascinated audience.

Peter from Scout Heritage Victoria had set up a brilliant display, which really portrayed how the Scouting movement has evolved over the years.

Finally, there was a wide range of static SARC displays featuring: Amateur Radio bands; call

Photo 7: Murray and the Milo Tin antenna.

Photo 8: "Can I have my rig back?"

signs and QSL cards; logbooks; abbreviations and jargon; the international radio alphabet; High Altitude Balloon payload development and the use of Amateur Radio Direction Finding equipment for triangulation in search and rescue missions.

Outside the hall, Kieran from the Victorian Scout First Aid Service had set up what looked to be more like a "Mobile Army Service Hospital" than a first-aid tent, proving that the Scouts really do come prepared for anything.

There were several working amateur radio stations on the scene of course: Anthony VK3YSA was manning the VK3SRC station on 40 m, while Murray VK3MJT was operating the VK3SAA station on VHF with a "Milo Tin" antenna (another great Australian invention).

Meanwhile any and all amateurs roaming around with handheld radios were encouraged to hand them over to any children in their vicinity and to help them get on the air: Some for the very first time. Radio procedure flash cards ensured that everything was above board. The result was a lot of chatter on 2 m FM simplex with most enjoying the experience so much it was actually quite hard to get the radios back!

Photo 9: ARDF Activity.

From the SRESU, Bryan VK3YNG and Kevin VK3KAB had children running in all directions tracking down hidden transmitters using Bryan's brilliant little ARDF sniffer setup. Kent VK3TER was trying just as hard to catch them all on his video camera.

At precisely 10 am everyone moved to the oval to launch four separate helium balloons. The first three were actually small latex balloons calibrated to gauge the ambient wind direction and ascent rate. The fourth was a larger silver foil balloon fitted with an amateur radio payload designated "SARC1".

An overly-elaborate "High Altitude Balloon Launch System" was employed to add a certain amount of theatre to the event. SARC leader Emilka was first to insert the key and turn it to the right to arm the system, setting off a bright flashing strobe light. Then, one by one other volunteers came forward to flip up a missile switch, activating an alert tone and selecting the next balloon in the sequence. Everyone stepped back and gave a final count-down as a remote-control button was pressed to actually launch the balloon. Hooray!

When the last balloon was finally airborne it was expertly tracked by Rhett VK3GHZ, Peter VK3XCO, Dean VK3NFI, Frank VK3FADI, Joe VK3YSP, Paul VK3D8P, David VK3KCX, Karl VK3LN and Mark VK3OHM! What was even more remarkable: It seemed like everyone present with a mobile device was actively following the balloon's progress on the Internet.

For the record: The tiny 50 g amateur radio payload, running on lithium batteries, transmitting BPSK31 telemetry on 434.650 MHz FM, lasted over six hours,

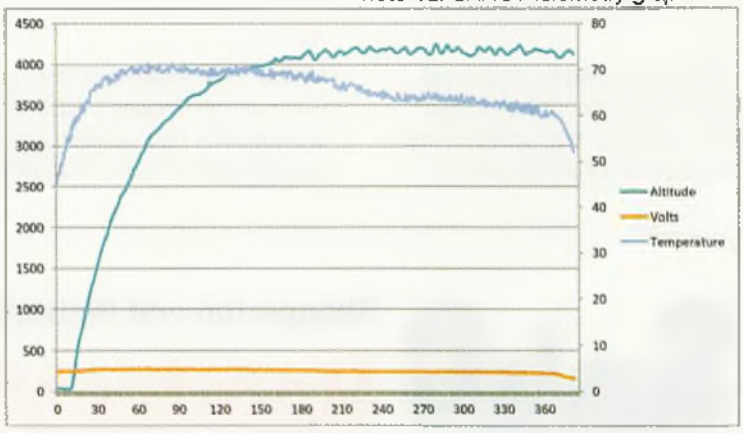
Photo 10: "Balloon 1 armed, Captain".

Photo 11: SARC1 takes to the skies.

reached an altitude of 4,000 m and travelled over 250 km! It was last heard heading East off the coast of Victoria, past the Gippsland Lakes.

And here is the telemetry graph: Indicating amongst other things that, at 70°C internal temperature, the polystyrene enclosure was probably a little too good as an insulator!

Photo 12: SARC1 telemetry graph.



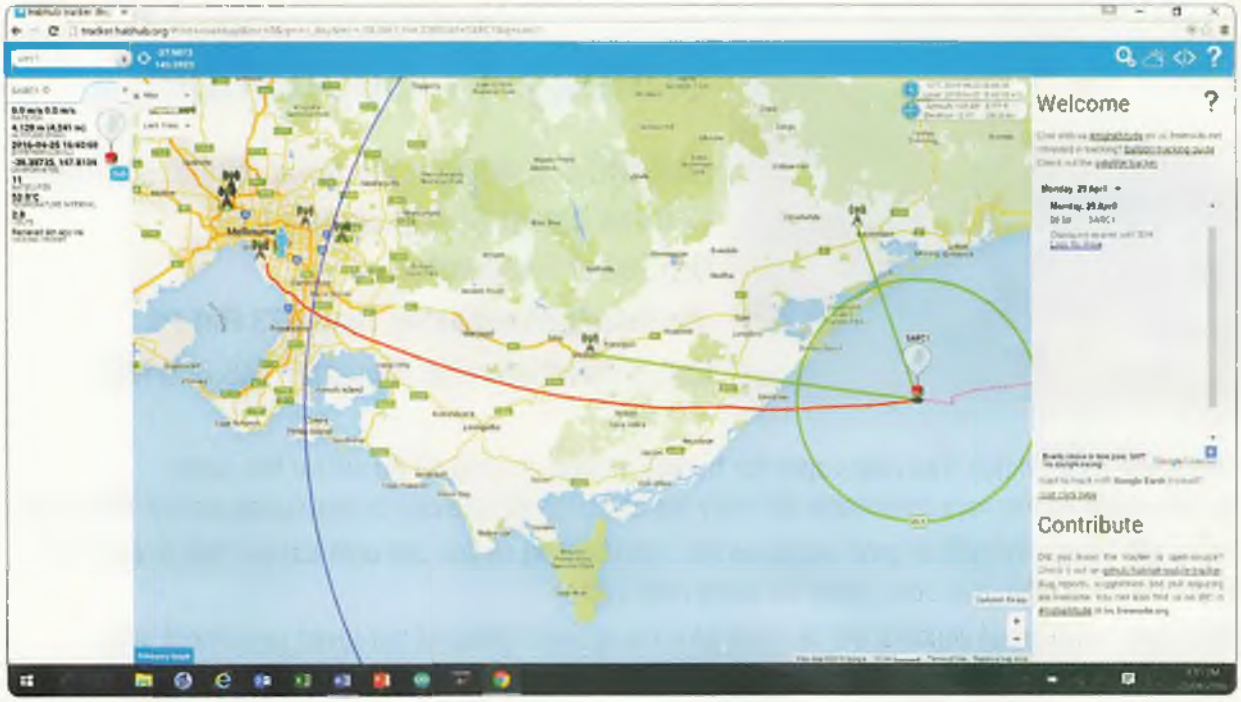


Photo 13: SARC1 track.

Photo 14: ANZAC Day Ceremony.

Next up, providing some real solemnity to the occasion was an ANZAC day commemoration. The ceremony was presided over by Murray with assistance from Ian and Glenn of the Bentleigh RSL who provided the flag, speech and a recording of the Last Post. Murray and the Scouts did a fantastic job.

It was then time for a BBQ lunch and something called the "Damper Pit" - a strange Scout ritual where flour and water are mixed to a sticky consistency, attached to a stick and cremated over hot coals.

All the demonstrations continued after lunch giving some a chance to rotate through the different activities. At 1:40 pm there was a respectable pass of the FO-29 Amateur Radio satellite with some New Zealand stations coming through very loud and clear for ANZAC day.

To wrap up: A great day was had by all. The event would not have successful without help from so many people and absolutely everyone agreed that we should do it all again next year!

Product Review | FTM-400DR 144/430 MHz Dual Band Transceiver

Peter Hartfield VK3PH

The FTM-400DR 144/430 MHz dual band mobile transceiver is one of Yaesu's latest in the System Fusion range. Combined with the HRI-200 WIRES-X internet linking unit, this is a highly functional digital communications system for the modern amateur.

Features

- 144/430 MHz dual band transceiver with automatic detection of FM/C4FM digital communication mode
- Wide band receiver in the 108 MHz to 999 MHz range
- Transmit power of 50/20/5 W selectable with cooling fan
- LCD front panel complete with 3 m separation cable and mounting bracket
- Full colour 90 mm LCD high luminance TFT touch panel
- 1000 memory channels split between the A Band and B Band
- Supports micro-SD card for programming, backup and cloning to other transceivers
- VFO or memory scan functions
- Built in GPS receiver for display of location and movement information
- APRS function built in for communication of location and messages
- Group monitor function for information exchange between frequently communicating groups
- Support for Yaesu's WIRES-X internet linking function
- Optional Bluetooth adaptor for hands free operation
- Optional voice guidance unit provides voice announcements and recording of received audio
- Optional camera equipped microphone

Photo 1: The FTM-400DR transceiver.

In the box

The main unit and detached control head

- DTMF microphone (MH-48A6JA)
- Fused power cable with bare ends for connection to the mobile power supply (the connector at the transceiver end is a standard 2 pin auto plug and two spare fuses are supplied)
- Mounting brackets and screws for both the transceiver and the remote head
- Manual (which is also available to download from the Yaesu web site in PDF format)
- Programming cable (SCU-20) – this is a huge addition to the box as the programming software is also available free for download from the Yaesu web site
- Stereo to mono plug for connection to the external speaker jack
- 3 m controller cable (for remote head)

Photo 2: The HRI-200 Internet Linking Unit.

Installation

The mounting brackets for most of the Yaesu mobiles are identical in size and the screws are interchangeable if you are replacing an existing unit. In this case I had already installed the FTM-100DR in place of the FT-7900 in the car, so this unit was installed and reviewed on the bench.

The antenna connector is a UHF type socket unlike the FT-7900 which has an N socket. I am not sure why Yaesu have changed these connectors, although it wasn't a big problem for me as I have a coax feed into the shack with a PL259 connector at the radio end. The power cables are standard 2-pin, so no problems running a short lead from the radio to the Anderson PowerPole distribution box.

The remote head mounting bracket comes with a double sided adhesive sheet that is designed to stick to a flat panel on top of the dash. In my case I used Velcro strips to secure the remote head to the top of the power supply unit. This provided easy access to the controls.

I plugged the control cable into the back of the remote head and the other end into the transceiver. The microphone also plugs directly into the transceiver. If you have the transceiver mounted remotely, an extension cable will be required. Then I powered up the transceiver and I am on air.

Operation

Programming software is not required to configure the transceiver although I would highly recommend using it due to the many features available and their complexity. As already mentioned, the programming cable is provided and the software is downloadable for free from the Yaesu web site. When the transceiver is first powered on, you will be asked to enter your callsign. The LCD screen will basically guide you through this process using the touch screen to select the required letters. Up to 10 alphanumeric characters can be entered including a hyphen.

To turn the transceiver on, press the power button for two seconds and the LCD screen comes to life. To turn the transceiver off, press the power button again for over two seconds or you can configure the auto power off feature to turn the transceiver off after an interval of inactivity. I am not using this function in the shack although it is very useful for a mobile situation to avoid draining the car battery if the transceiver is accidentally left on.

The power button also doubles as a lock key to stop any accidental operation of the transceiver. Press the key momentarily to lock and again to unlock. The FTM-400XDR has a true dual band receiver and can therefore receive signals on two frequencies at the same time (either on the same band or on different bands). The screen is split in two showing the details of each frequency being received. The active or the current transmitting frequency is shown in bright colour, the other is greyed out. Changing between transmit frequencies is as easy as touching the required active frequency on the screen.

There are two volume knobs on the front panel, one for band A (upper) and one for band B (lower). There are two dials on the right hand side, one for band A (upper) and one for band B (lower). These are used for adjusting the frequency, selecting a memory channel or selecting an item when programming etc. The touch screen is used for most other functions.

The other buttons on the front panel provide the following functions (in each case, select the first function with a momentary press and the second function by pressing and hold for over 1 second):

- DX – switches the operating band communication mode (FM/C4FM etc.); activates the WIRES-X function
- Power LOCK – locks/unlocks the screen; switches the power on/off
- DISP SETUP – switches the information display between your location, received station location or GPS info screen; enters the SETUP menu
- F MW – displays the function menu; enters the memory writing mode
- GM – activates the group monitor function

In addition to the physical buttons, there are four user programmable soft function keys displayed on the lower segment of the touch screen.

The supplied microphone (MH-48A6JA) also supports most of the above functions so that the transceiver can be operated without touching the front panel. In addition, there are four function keys that can be programed to perform your most commonly used functions.

Built in GPS

The GPS reception antenna is located in the detachable front panel (top centre). For this reason, it is recommended that the front panel is mounted on the dash or at the front side of the centre console to gain a clear GPS signal. The icon (looks like a satellite) in the top right hand corner of the screen indicates a GPS lock (flashing means finding the GPS signal and stable means GPS locked).

Available screen displays

Dual Band screen – shows band A at the top and band B below. At the bottom of the screen are the soft programmable function keys. By default, these are V/M (switch between VFO and memory mode); SQL (touch this to use the knob to adjust the squelch level); MUTE (to mute the sound); and SCOPE (to select the band scope function).

Band Scope screen – displays the band scope below the operating frequency. The width of the band scope can be set to wide or narrow as desired.

Function Menu screen – displays the available functions under the operating frequency. The options can be scrolled through using the forward and back functions. Pressing one of the functions displays the next level of detail or guides you though the settings. Any of the functions displayed at the top menu level can be associated with one of the four dedicated function keys.

Compass screen – The direction of travel of your own station and direction coordinates of the received station are displayed on the compass screen.

Altitude Display screen – The altitude of the current location is shown in the bar graph display.

Timer / Clock screen – The current time is shown in analogue and digital formats along with the date.

Other available screens include Lap Timer screen, Count down Timer screen, GPS Detail screen, Numbers and Symbols input screen, and Alphabet input screen.

Programming the transceiver

There are a few options available for programming the transceiver. The most basic option is via the front panel. You will probably want to load it with a large list of local repeaters therefore I would highly recommend using programming software. After all, the transceiver comes with a programming cable and the Yaesu software can be downloaded from their web site for free.

I use RT Systems software for programming all of my transceivers; therefore I downloaded a copy of the FTM-400XDR radio programmer which cost me $25 USD (~$35 AUD). The RT Systems software will work with the Yaesu supplied cable or a micro-SD card. The FTM-400DR is not yet listed on the CHIRP web site, although I'm sure it will appear soon given the popularity of this software.

The best place to get the latest repeater files is from the WIA web site. There is a CSV file available that can be massaged and imported directly into the programmer. When you run the programmer, you will notice that there are two bands available (Band A and Band B). Yaesu has decided to remove the memory bank functionality from this transceiver to help reduce its complexity. I personally think this was a wrong move because organising memories into banks is great for travelling and grouping favourite channels together.

I configured all of the 2 m repeaters for VIC (50 of) in Band A and 70 cm repeaters (65 of) in Band B. The 500+500 available memory channels will be more than adequate for most users in Australia. This was a simple copy and paste from the FTM-100DR repeater configuration file I setup earlier in the year.

In addition to the Band A and Band B memories, there are nine pairs of limit memories that can be programmed for each band; five home channels and the initial VFO frequencies can be set. All of the other functions can be set via tabs on the menu settings window. There are too many functions to go through here. Once you have saved the transceiver configuration, you have the option of communicating with it via the supplied cable or saving the configuration to a micro-SD card.

Micro-SD card

The micro-SD memory card slot is located at the front of the main body. The letters SD are displayed on the front panel when a card is detected in the transceiver. Note that a micro-SD card is not supplied with the transceiver. The micro-SD card can be used for the following functions:

- Backing up the information and settings of the transceiver
- Saving GPS log data for use in a personal computer
- Saving data downloaded using the GM and WIRES-X functions
- Exchanging data with other transceivers

The transceiver supports micro-SD cards from 2 GB to 32 GB in size. According to the manual, not all commercial micro-SD cards will work and the card must be initialised in the transceiver to ensure proper operation. I used an 8 GB SanDisk Ultra without a problem. The transceiver supports the FAT32 file system. Note that if you format the card in the transceiver according to the initialisation procedure, all data on the card will be lost.

The micro-SD card is a very convenient way to program or re-program the transceiver after it has been installed in a vehicle. It is a much easier alternative to removing the transceiver or having to take your laptop and cable out to the vehicle. Simply insert it in the transceiver, select write to micro-SD card and remove it. Insert the micro-SD card into a personal computer. The programming software allows you to read from it, make whatever changes you need and then write back to it. Re-insert it into the transceiver, perform a read from micro-SD card and you are up and running with the changes you just made.

C4FM digital mode

As you can see, this transceiver is packed with features, but the main attraction is the C4FM digital mode. The FTM-400XDR transceiver is equipped with an Automatic Mode Select (AMS) function which automatically selects one of four transmission modes depending on the signal received. If AMS is off, the mode can be set manually.

- DN (voice / data simultaneous transmission mode) – This is the standard mode for C4FM digital. Transmission is less prone to interruptions due to detection and correction of voice signals. GPS data (if available) is transmitted along with the voice data and the transmitting stations Callsign. The LCD screen will display the Callsign and distance to the received station (if GPS data is available).

- VW (voice full rate mode) – digital voice data is transmitted using the full 12.5 kHz bandwidth which enables high quality voice communication.
- DW (high speed data communication mode) – data is transmitted using the full 12.5 kHz bandwidth for image and message transmission.
- FM (analogue FM mode) – standard FM mode of transmission which supports communications with stations not able to transmit using a digital mode.

Compared to other digital modulations within FDMA, C4FM has excellent communication quality, Bit Error Rate (BER) characteristics. Presently, C4FM is the standard method for professional communication devices in FDMA, and is therefore expected to continue to be the main stream digital communication in the future.

On air, the number of repeaters and users of C4FM devices is starting to grow. I have had many contacts while testing this transceiver and I can say that the audio quality certainly lives up to expectation both through the local repeaters and via simplex communications. The ability of the transceiver to drop back to conventional FM mode when it hears one of these signals is simply amazing.

Unfortunately, I can't tell you where to find all the repeaters here, although I know there are several in VIC, NSW, QLD and WA. I hope to have a full list available for the 2017 Callbook.

APRS feature

Setting up the APRS feature on this radio was fairly straightforward after having done it before for the FTM-100DR using the right frequency (145.175 MHz) and band rate (1200 baud). Turning on the APRS modem suddenly brought the transceiver to life displaying station information as far away as VK5, VK7 and VK2. Turing on the auto beacon feature enabled me to contribute my position.

The configuration options for APRS are quite extensive therefore I won't go through them here. Suffice to say Yaesu provides a separate instruction manual for APRS that is available for download from their web site.

WIRES-X feature (HRI-200)

The WIRES-X feature is a system that links to other users via the internet which enables communication world-wide regardless of the distance between

Photo 3: The transceiver and associated equipment set up to operate as a WIRES-X radio node.

Photo 4: A functional diagram of the WIRES-X communications system.

stations. To establish a WIRES-X node, the WIRES-X connection kit (HRI-200) and an internet connected PC is required. Yaesu provide separate instruction manuals for WIRES-X setup (HRI-200) and operation (for each model transceiver).

To establish a node, you first need to register with Yaesu. You will need to complete a web form and have the serial number of your HRI-200 internet linking unit handy. The process was very easy and was completed within 24 hours. You can find out more about WIRES-X and where to find nodes at the following web site: *https://www.yaesu.com/jp/en/wires-x/index.php* (click on the WIRES-X ID list button). If you also click on Asia, Oceania then sort by country, all of the Australia nodes will be at the head of the list. My DTMF node ID is 14090. I count 39 nodes currently listed in Australia at the time of writing.

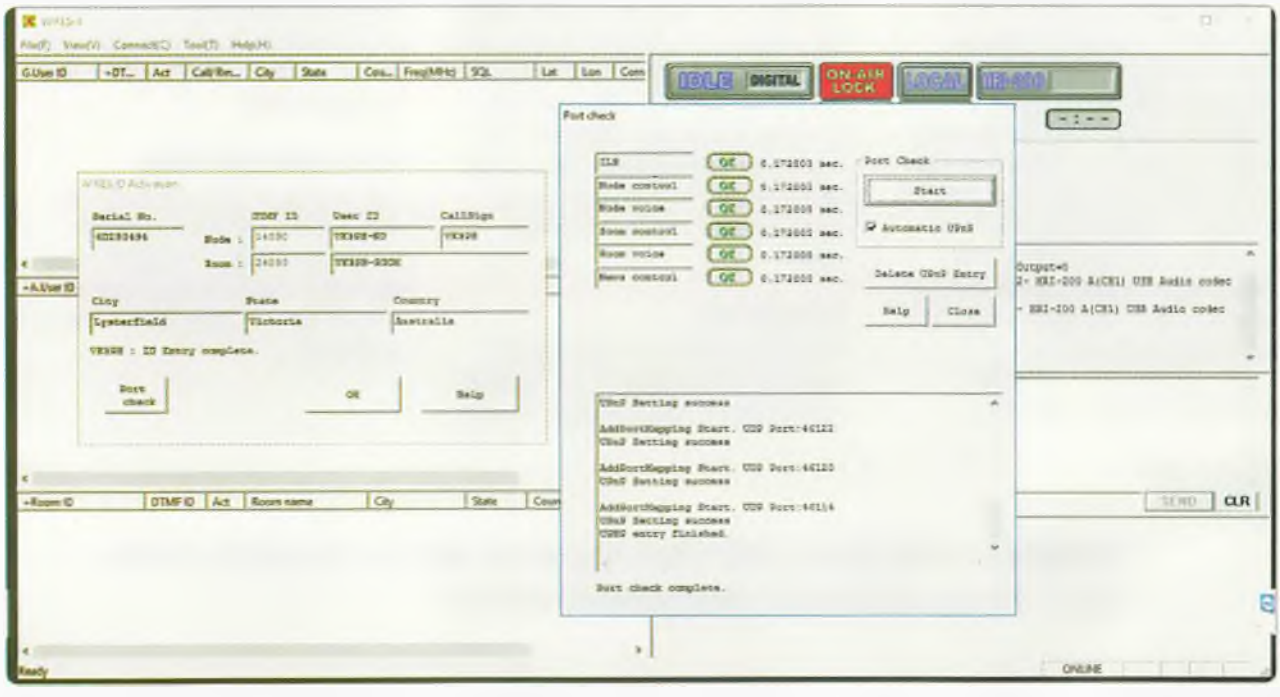
If the node is active, you can find its frequency on the WIRES-X Active ID List. When operational, I put my node on 439.125 MHz as this frequency shows up as an internet linking frequency in the current WIA band plan. With the current location of the antenna, my node can be heard throughout the Eastern Suburbs of Melbourne. There don't appear to be any other nodes on this frequency within range.

The HRI-200 comes with a standard USB cable for connection to the PC. The unit is powered by this connection. It also comes with a 10 pin to 10 pin mini-DIN cable for connection to a digital radio and a 10 pin to 6 pin mini-DIN cable for connection to an analogue (FM) radio. The HRI-200 supports connection to up to 2 radios. I'm using the FTM-400XDR as the digital radio and the FT-7900 as an FM radio node (for those that don't have C4FM).

Connect the HRI-200 to the PC using the standard USB cable and then install the WIRES-X software. The PC must have a connection to the internet and the router must be capable of port forwarding. My router is connected via ADSL and has the automatic UPnP setting enabled. This is a much simpler way of setting up the required ports to forward as the software takes care of that for you.

The next step is to run the software and register your node.

Photo 5: A screenshot of the WIRES-X Activation screen.



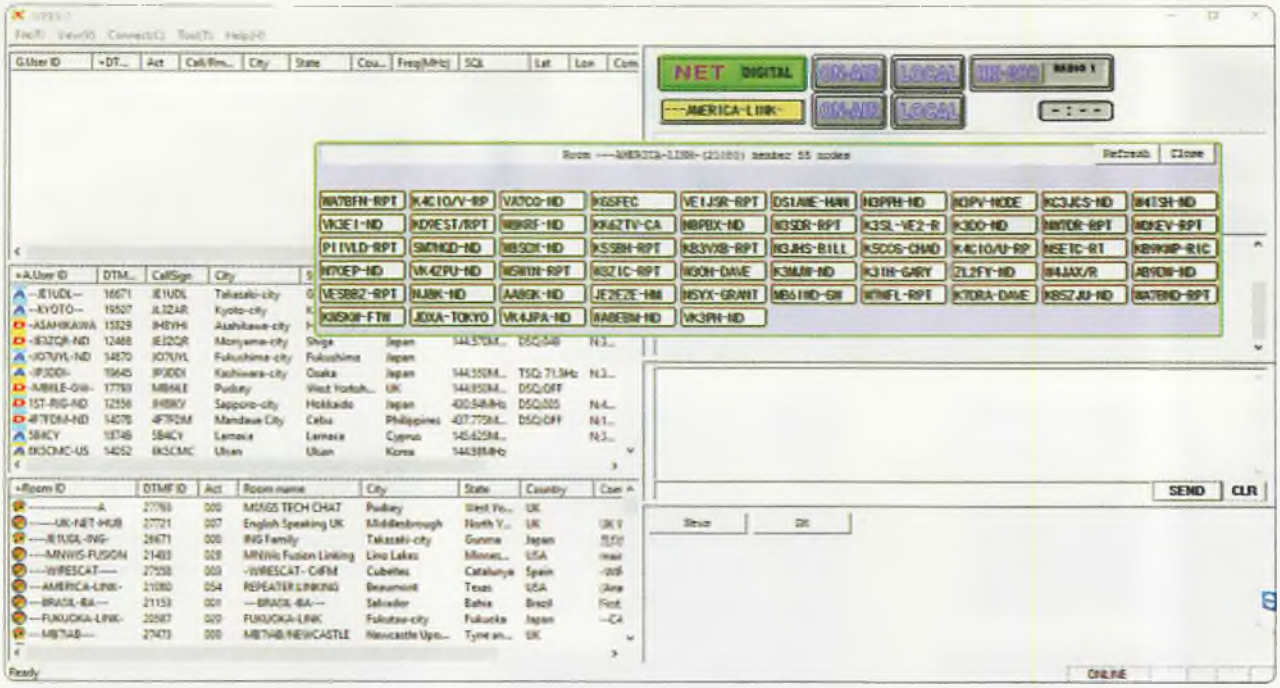


Photo 6: A screenshot of the WIRES-X Activation Software when connected to the America Link node.

Run the port check function to ensure the server can be contacted and if all ports show OK, you are up and running. Active nodes will display in the node window and active rooms in the rooms window. To connect to a node or a room from the software, simply right click on the room you want to connect to and select the connect option.

From your handheld or other transceiver, you can access the local node by tuning to the node frequency and pressing the X button (or using DTMF for the FM node). You can now have a normal conversation with the remote station or group of stations connected to the room. There is a regular net conducted in the Americas room at around 10 am Sunday morning EST if you would like to join in.

To start the FTM-400XDR in WIRES-X mode – turn the transceiver off. Press the DX and GM buttons at the same time as the power button to start the WIRES-X mode.

Cross band repeater function

There is a nifty undocumented feature of the FTM-400XDR: that it will operate as a cross band repeater. To start the FTM-400XDR in cross band repeater mode, select the receive and transmit frequencies on the A band and B band and turn the transceiver off. Press all three buttons on the right hand side and the power on button simultaneously and the unit will start up in cross band repeater mode. It works a treat!

Conclusion

The FTM-400XDR 144/430 MHz dual band transceiver is a compact mobile device that manages to pack a huge amount of functionality into a very flexible package. In addition to the normal functions you would expect from an amateur transceiver of this nature, it supports digital (C4FM) mode, APRS, GM (group monitor), WIRES-X, Bluetooth (option) and comes equipped with built in GPS. In addition, it comes with a programming cable, remote head separation kit (3 m cable and bracket) and a micro-SD card slot for backup, programming and storage of data.

Acknowledgements

I would like to thank Ross Keogh from Strictly Ham in Bayswater for the supply of all equipment for the review. Next month, I will be reviewing the FT2D dual band digital handheld.

Specifications – General

Frequency range	TX 144 – 148 MHz 430 – 450 MHz RX 108 – 137 MHz (Air Band) 137 – 174 MHz (Incl. Ham) 174 – 400 MHz (GEN1) 400 – 480 MHz (Incl. Ham) 480 – 999 MHz (GEN2)
Channel steps	5/6.25/8.33/10/12.5/15/20/25/50/100 kHz
Emission type	F1D, F2D, F3E, F7W
Frequency stability	±2.5 ppm -20°C to +60°C
Antenna impedance	50 Ω
Supply voltage	Nominal 13.8 VDC negative ground
Current consumption	0.5 A receive 12 A transmit (50 W TX)
Operating temperature	-20°C to +60°C
Case size	Radio unit: 140 x 40 x 125 mm w/o fan Front panel: 140 x 72 x 20 mm
Mass	1.2 kg total

Specifications – Transmitter

RF power output	50/20/5 W
Modulation type	F1D, F2D, F3E: variable reactance modulation, F7W: 4FSK (C4FM)
Spurious emission	At least 60 dB below
Microphone impedance	About 2 kΩ
Data terminal input impedance	About 10 kΩ

Specifications – Receiver

Circuit type	Double conversion super-heterodyne
Intermediate frequencies	A Band 1st 47.25 MHz, 2nd 450 kHz B Band 1st 44.85 MHz, 2nd 450 kHz
Receiver sensitivity	108 – 137 MHz (AM) 0.8 µV typ. for 10 dB SN 137 – 140 MHz (FM) 0.2 µV for 12 dB SINAD 140 – 150 MHz (FM) 0.2 µV for 12 dB SINAD 150 – 174 MHz (FM) 0.25 µV for 12 dB SINAD 174 – 222 MHz (FM) 0.3 µV typ. for 12 dB SINAD 222 – 300 MHz (FM) 0.25 µV typ. for 12 dB SINAD 300 – 336 MHz (AM) 0.8 µV typ. for 10 dB SN 336 – 420 MHz (FM) 0.25 µV for 12 dB SINAD 420 – 470 MHz (FM) 0.2 µV typ. for 12 dB SINAD 470 – 520 MHz (FM) 0.2 µV for 12 dB SINAD 800 – 900 MHz (FM) 0.4 µV typ. for 12 dB SINAD 900 – 999 MHz (FM) 0.8 µV typ. for 10 dB SINAD Digital mode 140 – 150 MHz (Digital) 0.19 µV typ. For BER 1% 420 – 470 MHz (Digital) 0.19 µV typ. For BER 1%
Squelch sensitivity	0.16 µV (144/430 MHz)
Selectivity	FM, AM 12 kHz / 35 kHz (-6 dB / -60 dB)
AF output	3 W (8 Ω, THD 10%, 13.8 V) internal speaker 8 W (4 Ω, THD 10%, 13.8 V) optional MLS-200-M10
AF output impedance	4 – 16 Ω
Strength of secondary radio waves	4 nW and below

A day in the country – presenting the 2016 Wilkinson Award

Roger Harrison VK2ZRH

David Scott VK2JDS was named as the recipient of the 2016 *Ron Wilkinson Achievement Award* at the WIA's Annual General Meeting, held on Norfolk Island on 28 May. The Award citation says *"for his activities in 1296 MHz moonbounce, helping to maintain a profile of Australian participation in this leading-edge amateur pursuit. David actively supports and promotes activity on the UHF and microwave bands, particularly portable and Field Day operations, and assists others to pursue use of these bands."*

Dave is one of the stalwarts on 1296 MHz moonbounce from Australia, particularly so since the passing of Doug McArthur VK3UM last February. He is a frequent entrant to the tri-annual VHF-UHF Field Days, active on all bands from 50 MHz through 76 GHz. On top of that, he rarely misses a trip to

Photo 1: Dave VK2JDS and his 5 m dish for 1296 MHz moonbounce. It is a re-purposed dish originally used for suburban satellite TV reception. Behind the hub, you can see there's a large-ish enclosure, which houses the 23 cm PA. Dave has a high power permit to run 300 W, but is currently running 150 W output, with 140 W measured at the feedpoint. Below the PA enclosure, you can see a small square object through the mesh. This is a milk crate filled with rocks from the ground nearby – the dish counterweight! Around the lower edge of the dish, a wire-mesh skirt has been added to reduce ground noise. A 5-legged frame supports the septum feed, fashioned from re-purposed aluminium extrusions. Yes, you guessed right – dish pointing is by the "Armstrong method". A length of heavy fencing wire fastened to the rear of the hub and bent into a loop at its end provides an eye-sight through the hub for sighting the moon. Rural ingenuity at work!

Photo 2: An astonished Dave Scott VK2JDS receives his Ron Wilkinson Award. Photos by Phillipa Scott.

the annual GippsTech conference in Churchill, Victoria. Since the Geelong Amateur Radio Club (GARC) came upon a source of 3.5 GHz panel transceivers last year, and published ways to convert three panels into two 3.4 GHz amateur band transverters, Dave devised a method for one-to-one conversion, which helped boost the popular take-up of these rigs for the 9 cm amateur band.

At the AGM, I volunteered to travel to Dave's home to present him with his framed certificate, and obtain the photograph of the happy occasion that you see here. He lives in Gowan, in western NSW, in the mountain ranges 51 km out of Bathurst. As I don't own a car, or drive, I planned to do a day-return trip by train, which Dave informed me would be *"just possible"*.

Hence, on Monday 13 June, the Queen's Birthday holiday in NSW, I caught a morning train from Parramatta out to Lithgow, from where the train service provides a bus to Bathurst, a three-hour-plus journey. Dave was waiting when I arrived around 1230. On the drive to Gowan, once we left the suburbs of Bathurst and left the bitumen, the road became increasingly rugged the further we went. I quietly pondered *"what have I got myself into?"* Dave pointed out various local scenic, geographical and geological features as we went, as the area was renowned as a gold mining region during the 19th century gold rush era. Finally, we stopped at the gate with a microwave oven for a post box. That'd be right.

The road into Dave's and his wife, Phillipa's, house was yet more rugged than the one we just left! As we rounded the final corner to approach the house, there on a slight rise above it, a five metre dish dominates the skyline. Overcoming the initial shock, one sees a small garden shed to one side – the moonbounce shack! A smaller dish on a post to one side of the shack points skyward. Adjacent to that is "the boneyard", a collection of dishes and related accoutrements. A 10-element 2 m Yagi peeps above the shack roof.

Dave and Phillipa built the house themselves, each synchronising their long-service leave for the project. It is entirely solar-powered, with banks of photovoltaic (PV) panels on the roof charging large ex-exchange batteries housed beneath the house's ample eaves.

The moonbounce shack is also solar-powered with its own panels and batteries in a large box beside the shed.

Dave embarked on his moonbounce adventures in about 2002. The 5 m dish you see in Photo 1 is of mesh-petal construction over a skeletal frame. It was purchased from a satellite TV enthusiast in St Ives, on Sydney's upper north shore. Dave and Phillipa wrestled into the back of a ute and drove it back home to Gowan! Phillipa also has her amateur licence. There was no need for Dave to explain why he needed a dish that size.

In the garden shed shack, Dave runs an IC-910H transceiver, with a 10 MHz reference-lock, which facilitates working with digital modes (JT65). Apart from JT65, which he uses predominantly, Dave also uses CW – particularly on EME contest weekends – and occasionally SSB when the other end stations have bigger dishes. He is just able to detect his own echoes by ear, which he demonstrated easily. It's always an uncanny feeling to experience that, knowing the signal travels 384,000 km there and back. Unsurprisingly, Dave can hear the Dural 23 cm beacon VK2RSY 180 km to the east over the Blue Mountains, even though he can't lower the dish elevation fully.

While the house and moonbounce shack are situated at 850 metres altitude, shielded from stray RF by low hills, Dave has another mountain top 700 metres further west and at 950 metres altitude. There, he has installed a small industrial shed, which has been re-purposed into a ham shack, naturally. The site has clear views for 360 degrees and slopes down in all directions. Solar power is installed. A 6-element Yagi and a large HF loop have feedlines plumbed into the shed behind shelving inside, where a transceiver can plug-in, when required. A 3 m dish is mounted nearby, but rather the worse for wear from its exposed position. The 6 m Yagi shows signs of the ravages of weather, but still works fine, says Dave.

While active on 23 cm moonbounce, Dave has experimented with receiving EME signals on 3 cm (10 GHz), using a 1.2 metre dish mounted near his 5 metre dish. Looking to the future, he has acquired gear for the 13 cm and 9 cm bands. He plans to get 9 cm operating soon on a 4.3 metre dish.

An inveterate homebrewer, in addition to 'the usual' multimeters and microwave power meters, Dave maintains spectrum analysers and a high-spec microwave frequency counter, all locked to rubidium atomic standards or a GPS disciplined oscillator.

Amateur radio isn't the only hobby in the Scott household. Phillipa collects uranium glass bric-a-brac (which glows in the dark ...) and Dave collects radioactive rocks and industrial objects. Phillipa carries a Geiger counter in her handbag when out and about in country towns, to check out the ornaments in shops selling antiques and old wares. They have the biggest collection of uranium glass ornaments I have ever seen.

After my day in the country, Dave delivered me back to Bathurst station to catch the XPT back to Parramatta.

About the Wilkinson Award

The Award is one of the oldest and most important made by the WIA. It is for special achievement in any facet of amateur radio and is only available to amateurs from VK call areas.

Ron Wilkinson VK3AKC was a well-known VHF-UHF operator and homebrewer over the 1950s-1970s. He distinguished himself by making the first moonbounce contact from Australia on 1296 MHz, with a huge homebrew dish and hand-built transverter and kilowatt vacuum-tube power amplifier.

The Award was made possible through the generosity of Mrs Mary Wilkinson, widow of the late Ron Wilkinson VK3AKC.

The award was first presented in 1978 to Wally Green VK6WG, for record-breaking contacts on 1296 MHz across the Great Australian Bight.

I met Ron in the mid-late 1960s when I was a student at RMIT. After moving to Sydney in 1971, I started 6UP, a VHF-UHF newsletter. Ron was a subscriber and occasional contributor. I visited him at home in 1973 and had a tour of his EME setup, which was housed in re-purposed chook sheds in the back yard. His 10 metre dish took up most of the space. His wife, Mary would aim the dish, while Ron operated the transceiver.

VK2ZRH.

The Norfolk Island technical talks

Peter Freeman VK3PF

In the afternoon following the formal Annual General Meeting and Open Forum, two streams of talks were given to those present.

Peter Freeman VK3PF spoke on **SOTA: the impact in Australia & New Zealand**, outlining the growth of SOTA in Australasia since it kicked off in VK3 in 2012. Peter noted that the South Island of New Zealand became "live" in SOTA at the beginning of May, with the rest of New Zealand commencing as part of SOTA in December 2015. Growth has been strong in some call areas, with the level of activity smaller but growing in the more recent SOTA Associations. The most popular band to date has been 40 m, due to the usually good daytime propagation and being a band available to all three Australian licence levels.

Parks Activities as portable operation grows was the topic discussed by Paul Simmonds VK5PAS. Paul spoke of the growth in portable operations, focussing on the significant increase in awareness of Awards available for activating and chasing from declared Parks. The well-known Keith Roget Memorial National Parks Award promoting amateur radio activity in Victorian National Parks was followed by the introduction of the South Australian National Parks and Conservation Parks Award. These awards lead to increased awareness of the World Wide Flora and Fauna award scheme, with significant increases observed in portable activations, especially in VK3 and VK5. Activity levels continue to climb around the country.

Chris Chapman VK3QB and Luke Steele VK3HJ described **Setting up and operating a DX station.** They outlined the considerations and planning required for a small-group DX operation, using their current activation of Norfolk Island as one of their examples. They noted that having a small group of amateurs that can work well together was as important to the success of the operation as all the radio equipment and associated hardware.

Norfolk Island local John Anderson VK9JA spoke on **Norfolk Island Navigation Aids, the Pacific Cable, WWII Radar and a bit of Amateur Radio History**. John gave an illustrated account of some of the radio and telecommunications equipment used over the years on Norfolk Island to maintain contact with the outside world. John also invited those present to visit his museum of equipment.

WIA and NZART have an arrangement where one society visits the other's AGM, helping to strengthen the relationship between the societies. NZART was this year represented by Neill Ellis ZL1TAJ, who also spoke on Storm-chasing: what it's about, informing those in attendance of the involvement of suitably trained radio amateurs in assisting in the monitoring of severe weather events in the US.

WIA Director Roger Harrison VK2ZRH spoke on **Amateur Radio - past, present and future.** Roger outlined some of the past changes in our development and the regulatory environment before discussing some of the challenges that will confront us as the regulatory environment changes in coming months. He also outlined some of the proposed changes to the LCD that are seen to be desirable to keep our hobby attractive and relevant in the modern world.

Andrew Mason VK4NDY conducted an interactive forum **Amateur Radio & Social Media.** Andrew is researching the links between amateur radio, perhaps the original social media mode, and modern social interactions facilitated by modern communications technologies and the internet. Following the conclusion of the forum, Andrew interviewed many of those present on Norfolk Island for the WIA events to help him build a better understanding of both our hobby and modern social media.

Photo: Jim Tregellas VK5JST receiving his Amateur Radio Technical Award certificate from WIA President Phil Wait VK2ASD during the Open Forum. Photo by Paul Simmonds VK5PAS.

SOTA & Parks

Allen Harvie VK3ARH

We welcomed two new Mountain Goats this month.

With two different styles demonstrating the broad approach to SOTA:

Photo 1: VK3XDM Mitch on VK3/VE-011 Mt Stirling demonstrating extreme SOTA gaining winter bonus points.

Mitch (David) VK3XDM/ VK7XDM

Mitch was introduced to amateur radio by Rik VK3EQ through their common interest in volunteer search and rescue and ski patrol. He gained a Foundation licence in late 2012 and started SOTA with his first activation being a joint expedition with Rik in April 2013. David then upgraded to an Advanced licence in January 2014 in order to access more bands for SOTA activations and has continued to activate high value remote summits, often in company with Rik, during the bonus period. Given the conditions usually present, these activations are of high value, fast and furious, so valued by chasers.

He set a personal challenge to achieve 100 Activator uniques, 100 bonus and 1,000 Activator points; which was completed on 17 June 2016. Activations have included VK3, VK5 and VK7 and expeditions have included several First Activations including: VK3/VE-036 Mt Winstanley, VK3/VE-174 Stilman Plateau, VK3/VE-033 Mt Number 3, VK3/VE-157 Mt Samaria, VK3/VE-140 VE-140, VK7/NW-046 Tinkers Lookout, VK7/NW-048 Gentle Annie, VK7/WC-003 Mount Field West, VK7/WC-005 Rodway Range, VK7/NE-024 Strzelecki Peak, VK7/NE-046 Counsels Peak, VK7/NE-057 Mount Killiecrankie and VK7/CH-022 Rats Castle.

Photo 2: VK2IO Gerard on Mount Tarana at 1277 m in the snow, with a chilly wind and the coldest temperatures of the weekend qualifying for SOTA Goat. We are all glad it did not turn to rain and cut short the activation.

Gerard VK2IO

Gerard has taken 205 activations over 2.5 years in 25 SOTA regions to reach Mountain Goat status. The qualifying contact was made on a joint activation with Nick VK2AOH from Mt Tarana VK2/CT-008 on 27 June 2016 using 40 m CW, with Steve VK7CW making it through the pile-up. The mid-week SOTA CW pile-up is itself an event that would not have been thought possible a few years ago and deserves acknowledgment in itself.

Gerard's unique style includes the use of CW during extended weekend and night activations. In typical fashion, Gerard qualified for Goat over the weekend when Sydney had its coldest day since 1996. The cold snap made for very wintery weather, so the bonus points were hard won. 10 of the 11 planned summits were activated, giving 100 activator points including winter bonus.

Again: well done to both Mitch and Gerard for gaining SOTA Goat status.

Freeze Your Butt Off (FYBO) Contest

And on the subject of silly old goats out in the cold, several activators combined SOTA and Park activations to participate in the inaugural Freeze Your Butt Off (FYBO https://vk5cz.com/2016/05/13/down-under-fybo/) contest .This contest is to encourage portable operations during cold and possibly wet and windy weather conditions.

This event was held over 25/26 June 2016 during a cold snap which made for very wintery weather. An Antarctic blast of cold air swept up the east coast of Australia on Friday, just two days earlier, resulting in record low temperatures and snow falls down to 500 metres from Bathurst to Ballarat. Melbourne shivered through the coldest June day in almost 20 years and Sydney had its coldest day since 1996. This was unseasonably cold.

I had planned to activate summits in Mt Buffalo National Park with Warren VK3BYD. However, after checking out the snow on Mt Buffalo, we decided to stay below the snow line for this event. Bernard VK2IB was on the ridge line to our left with the same intentions. Gerard VK2IO was busy activating to gain the points required for Goat hood. SOTA summits activated during this cold period included:

VK1MBE	Andrew on VK1/AC-040
VK2AOH	Nick on VK2/CT-005
VK2HRX	Crompton on VK2/CT-003
VK2IB/3	Bernard on VK3/VE-241, VK3/VE-144
VK2IO	Gerard on VK2/CT-031, VK2/CT-042, VK2/CT-007 & VK2/CT-011
VK3ARH	Allen on VK3/VE-126
VK3BYD	Warren on VK3/VE-165
VK3GRK	Graeme on VK3/VN-016
VK3JBL	Andrew on VK3/VC-003
VK6NU	John on VK6/SW-039
VK7XDM	Mitch on VK7/SC-001
VK7ZMS	Murray on VK7/SC-015 & VK7/SC-044

Also there were several park activations braving the cold including:

VK3ANL	Nick at Phillip Island
VK3HN	Paul at Kangaroo Ground
VK4AAC/3	Rob at Churchill National Park
VK5HSX/4	Stef at Camooweal Caves National Park
VK5KLV/P	Les at Mount Brown Conservation Park
VK5PAS/P	Paul at Ettrick Conservation Park
VK6MB	Michael at Sir James Mitchell National Park

My beanie goes off to those who camped in the snow (Gerard VK2IO, Compton VK2HRX and Nick VK2AOH), you're heroes or mad, I'm not sure which.

Thanks to everyone who was out on the day and special thanks to Ian VK5CZ for organising the event.

Paul VK3HN: *https://vk3hn.wordpress.com/2016/06/26/fybo-2016-at-kangaroo-ground/*

Allen VK3ARH: *https://vk3hra.wordpress.com/2016/06/30/fybo-2016-25-26th-june-2016/*

Andrew reports from abroad

Several Andrews have been travelling and playing SOTA:

See the Andrew VK1AD blog (*https://vk1nam.wordpress.com*) for reports of recent activations in Europe:

https://vk1nam.wordpress.com/2016/06/25/sota-gaisberg-austria/

https://vk1nam.wordpress.com/2016/06/25/sota-kaienspitz-in-switzerland/

Andrew VK3ARR, the activator we can't keep in VK, reports on his latest activations in JA:

https://vk3arr.wordpress.com/2016/06/21/ja6fo-042-oogusukuyama

Andrew VK1DA (*https://vk1da.net/blog/*) reports his recent activations in UK and visiting Ham Radio in Germany:

Following a little behind my fellow VK1 activator, Andrew VK1AD (ex VK1NAM), I visited the UK with my wife in May/June 2016, a first for us. (The similarity of our call signs and the matching name was to create some confusion later in my trip.)

After several weeks of touring around the south of England doing the tourist thing, I arranged with Jimmy M0HGY to activate one or more summits in the southern Pennines including Shining Tor, and possibly another.

The day arrived but with intermittent showers forecast for the entire day, a foot injury restricting my ability to even walk, let alone climb hills and a bout of insomnia timed right on the evening before I was due to drive to Macclesfield. I reluctantly cancelled the activation in the interests of safe travelling and ultimately, self-preservation.

A replacement plan was hatched for a few days later when I did get to G/NP-028, with the very kind assistance of Mike 2E0YYY. Even though the weather was not initially encouraging especially on his trip to Leeds to collect me, it worked out fine and I was able to activate and qualify on CW and SSB using my own radio and antenna, which was something I was keen to achieve. As I had made dozens of contacts with Mike, either as a chaser or as S2S contacts, it was great to

meet him, have a good chat and activate together.

Finally I attended the Friedrichshafen Ham Radio event in Germany and met many more SOTAnatics. This was a great pleasure and I was delighted to chat with many different people I had previously corresponded with, such as Andy MM0FMF, Phil G4OBK, Mike DB7MM, Guy N7UM, Jürg HB9BIN, Herbert OE9HRV and others whose call signs I was very familiar with, as well as many others. All SOTA people were interested to meet someone from VK and all made me feel very welcome and I thank them for that. The presentation session on Saturday afternoon was very interesting, starting with the Elecraft KX2 and ending with the graphic description of a gruelling climb of a summit complete with ants at the activation site.

I had a good chat with Guy N7UN about the NPOTA success in the USA and I certainly hope the aftermath of NPOTA is an increased interest in SOTA and a continuation of National Parks activations under the WWFF banner, which would be greatly welcomed by many European followers of WWFF, as well as any VK who could work them (it is hard).

I did make some purchases at Friedrichshafen, however more notable were the many items I would have liked to buy but restrained myself. For the future I will definitely be seeking to cut down my activation kit, which added too much to my luggage on this trip and restricted what goodies I could buy to take back.

Many SOTA chasers told me about having worked me in OE and HB0, I had to explain that they had not worked me, but had worked another Andrew, my SOTA friend VK1AD, a week or so earlier while he was visiting Austria. However I have taken all their greetings back home to pass them on to VK1AD.

SOTA activators and chasers are a lively and active bunch and I always find it invigorating to meet them, talk about our activations and the ones that got away, plan how to make s2s contacts (especially from North America to Australia) and generally absorb the SOTA "vibe" which is active, smart and innovative. In SOTA I believe we have a magic ingredient that makes the ham radio hobby quite uniquely interesting and of course the combination is addictive. I do echo Guy's suggestion that all activators include a newbie as often as possible in their plans. That is surely the most effective way to expand our ranks.

Thanks again to all who met and talked with me, those I worked from the one activation I made and everyone else I met, all of whom made me feel very welcome. Special thanks to Mike 2E0YYY for his assistance and hospitality.

73

Andrew VK1DA and VK2UH

That's all for now,

73 Allen VK3ARH

AMSAT-VK

AMSAT Co-ordinator
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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.

Contests

Trent Sampson VK4TS
e *vk4ts@wia.org.au*

Your new columnist

Trent VK4TS is the admin of VK Contest Club (VKCC) web (*www.vkcc.com*) and Facebook pages and has been an active contester since the 1970s; holder of multiple VK records in international contests in SSB, CW and RTTY modes, mainly as a member of multi operator Teams VK4KW, VK4SN, VK4WIS and VK4UC.

Contest priorities for August

Contest	Date	Rules	Difficulty	Software	Modes
Remembrance Day	13-14 August	WIA Contest	Easy/Fun	VKCL	SSB CW RTTY
WAE DX CW	0000Z, 13 to 2359Z, 14 August	DARC QTC for bonus points	Challenge N1MM Wintest Writelog	CW Only	
ALARA	27-28 August	ALARA Contest	Easy/Fun	VKCL	SSB and CW

Remembrance Day Contest: Some ideas on entering the contest

The Remembrance Day Contest has some unique strategies because it is very much a unique contest.

Band change regularly – at least every two hours – this is because when you hit three hours everyone can be reworked on the original band, select the band you can run well on but also listen to bands either side and remember there are no multipliers, it's purely a QSO chase.

Sitting and CQing on a dead band is not always the best strategy... tune up and down the band in quiet times looking for others:

- Consider multiple modes
- Consider high angle antennas for HF to optimise signals
- Don't forget VHF and UHF – even calling on the National Calling Frequency for 2 m FM, 146.500 MHz (ch50) can be effective in the RD
- Consider transmitting on two bands at once – there are no restrictions under the current rules for Single ops.
- A way to help in the wee hours: be friendly – exchange names where possible – you will need to work them several times over 24 hours.
- Remember what it is all about: The Remembrance Day Contest is the amateur radio equivalent of ANZAC Day.

RD CONTEST RULES - Quick Reference Guide

Date & Time: 0300 UTC Saturday to 0300 UTC Sunday on the August weekend closest to the 15th.

CATEGORIES	MODES	BANDS	SCORING	CONTACTS
1. Single Op 2. Single Op - QRP	1. Phone (AM, FM, SSB) 2. CW (CW, RTTY) 3. Mixed	MF (160m) HF (NO WARC) VHF & Above	160 m - 2 pts 23 cm & above - 2 pts All other bands - 1 pt	* Call CQ RD or CQ Contest * RS(T) Plus Number of years licensed (No Zero year) * Clubs & Multi - RS(T) + Nr of licensed years of oldest licensed ham present at the start of the contest. * 3 hours between repeat contacts on all bands.
3. Multi-Op Single TX. One signal on air at any time.	3. Mixed		Triple score on TX station between 0100-0600 local	* No Cross band contacts * No contacts via internet, Phones, repeaters, EchoLink, IRLP, satellites etc
4. Multi-Op Unlimited. 2 TX signals on air on any band. 1 phone and 1 CW.			CW & RTTY irrespective of band is Double Points	* Contacting the same call area IS permitted.

http://www.wia.org.au/members/contests/rdcontest/documents/RD-Rules-Quick-ReferenceGuide.pdf

ALARA Contest

Last full weekend of August every year.

ALARA's mission is to encourage women's interest and active participation in amateur radio.

Strategies are similar to the RD Contest (ALARA Contest rules in ALARA report)

http://www.alara.org.au/contests/

Contesters Tricks

The Footswitch (foot operated PTT)

In a multiple operator environment a foot switch reduces stress considerably. Running VOX in these environments will ultimately have the people in the room false keying the transmitter. It also ensures that the keying of rigs and amplifiers can be done efficiently. While the use of Heil footswitches is very common in the contester community, the poor Aussie dollar has led to Jaycar and the very good (and cheap) Part number SP0760.

Contester of the month

This month's contester is Peter Richardson VK2PR, current WIA Contest Champion.

Holder of the VK4PJ Peter Brown Trophy.

What is your favourite Contest?
I love the Harry Angel Sprint for its fast pace, easy format and short time span. I'm also a fan of the two big CQWW SSB contests for their popularity.

What is your favourite Rig?
Yaesu FT-2000. It's a solid radio and everything is at my fingertips; filters and other necessary settings are easily accessible without scrolling through menus.

What modes do you contest in?
Mainly SSB. I rarely do CW contests because I'm not very good at CW and I've never been enthusiastic about digital contesting.

What is your favourite contest band and why?
20 m for worldwide contests because of its easy propagation. 40 m and 80 m for Australian contests because I have fantastic antennas at my disposal for these bands.

What is your preferred Contesting Software?
N1MM Contest Logging Software, although I always use VKCL for the Australian contests.

What is your preferred Mic and Key?
Heil Pro-Set Elite because they're comfortable on my ears. Heil FS-2 Footswitch. I only have one key and it is a Vibroplex ARRL Centennial Iambic Key.

What is your best tip to a newbie contester?
Always Run! If the band is open, keep running. When the contacts slow down, tune around on the B-VFO to Search & Pounce and make contacts with other stations who only run but keep going back regularly (once every 10 - 15 seconds) to your run frequency on the A-VFO and call CQ. If you come across a multiplier you need while you're searching & pouncing on the B-VFO but you can't break through the pileup after a few attempts, leave it and try again later, but always keep going back regularly to your run frequency to call CQ and listen for a few seconds while you're searching & pouncing.

Contest Terms

Run = Call CQ and stay on the same frequency.

Search and Pounce = Tune across bands looking for stations calling CQ.

Multiplier= a station that increases your score owing to contest rules.

Emails can be sent to *vk4ts@wia.org.au*

36th ALARA Contest 2016

Diane Main VK4DI

NOTE: Contest is always on the last FULL weekend of August

Eligibility: All licensed operators throughout the world are invited to participate.

Object: To encourage YLs in the use of amateur radio.

YLs work everyone; OMs work YLs only.

Contest: Combined phone and CW run over 24 hours;

Saturday 27th August 2015 0600 hours UTC to Sunday 28th August 0559 hours UTC

Suggested Frequencies: All HF Bands to be used except 160 m & WARC Bands

Contacts made on EchoLink and two metres will also be accepted. (Separate logs for these would be preferred).

Operation: Single operator only (1 operator per call sign).

NB If YL is operating as a second operator; her husband/partner CANNOT participate in the contest.

Every individual phone or CW contact may be counted.

There must be an interval of greater than 1 hour between contacts with any one station on any one band and in the same mode.

All contacts must be made in accordance with operator and station licence regulations.

Procedure

Phone: Call "CQ ALARA contest"
CW: YLs call "CQ test ALARA"
OMs call "CQ YL"

Exchanges: ALARA member: RS (T) A , name. (59A /599A)

YL non-member, OM: RS (T), serial no. starting at 001, name and whether YL or OM.

OMs work YLs only

Scoring: Phone:
5 points for ALARA member logged
4 points for YL non-member logged
3 points for OM logged

CW: All contacts made on CW count for double points

OM:
5 points for ALARA member logged
4 points for YL non-member logged

Multipliers: 1 per VK/ZL Call area worked per band and 1 per DX YL Country.

Logs: Single log entry. Logs must show date, UTC time, band, mode, call sign worked, report and serial number sent, report and serial number received, name of operator of station worked and points claimed.

Paper logs and electronic logs both welcome.

Logs must be signed.

Logs also to show full name, call sign and address of operator, and show final score (points claimed).

Logs must be legible. No logs will be returned. Decision of the Contest Manager will be final, and no correspondence will be entered into.

Logs must be received by the Contest Manager by **30th September, 2016.**

CONTEST MANAGER:
Mrs Diane Main VK4DI, PO Box 546, Gatton, Qld 4343, AUSTRALIA
or: *alaracontest@wia.org.au*

Certificates will be awarded for the following:
Top score YL overall
Top score YL phone only
Top score YL Echolink
Top score Australian YL CW
Top score DX YL CW
Top score DX YL
Top score ALARA member in each country & VK call area
Top score OM in each continent & VK call area
Top score VK YL Foundation Licence holder

A **trophy** will be awarded for the following:

Top scoring Australian YL

Top scoring Foundation Licence ALARA member

The top scoring VK non-ALARA member will be awarded 1 year's subscriber membership to ALARA.

Please Note: This contest is always held on the last complete weekend of August.

Prepare

Jamboree on the Air JOTA | 16 October 2016

Jamboree on the Air involves both Guides and Scouts.

Annual event on the third full weekend in October, where the Scouts and Guides from around the world get together with amateur radio operators to communicate with each other around the world.

In Australia special callsigns can be allocated by ACMA.

DX Talk

Luke Steele VK3HJ

The higher bands have reflected the crashing solar numbers, with very little heard on 17 m and up. In the afternoons, North America and Europe still seem to be mostly good on 20 m, with the odd South American or African station to be heard too.

There doesn't seem to be a lot of activity on 30 m lately, but 40 m is still quite reasonable, with North America to be worked in the evenings.

There doesn't seem to have been much on 80 m and 160 m lately, but some South American stations have been heard in our evenings. Some North Americans have been worked, but they are struggling with summer storm static, even if we can hear them quite well on a quiet band.

I can't comment much on conditions in the early mornings, as it is too cold to get out of bed, but on the few mornings I have struggled out to turn on the radio, there hasn't been anything to justify the effort.

DX worked in June included XR0YS on Easter Island on 40 m, EA8TL on 20 m, 5W0COW in Samoa, ZD7FC St Helena, XX9TGM Macau, 9J2BO Zambia. XR0YS and XX9TGM were one-man DXpeditions, 5W0COW is also one operator, Tom KC0W, who is spending several weeks at each of a number of different entities, including Tuvalu, Vanuatu, Western Kiribati, Solomon Islands, back to Samoa, then Tokelau, Temotu Province, Bangladesh, Nepal and Bhutan. Look out for Tom on CW only, at his various locations until after the end of this year.

EA8TL Jorge is on most days, and puts a great signal into VK from Tenerife, Canary Islands. Another regular on air, but not often heard here is Bruce ZD7VC St Helena Island. Bruce has a good station, and often looks to the difficult path to our part of the world.

9J2BO Brian from Lusaka, Zambia is often heard here, mostly on CW. Brian enjoys a chat, using his Lionel J-36 bug key. Dom FK8CE in New Caledonia is on regularly, and Jean-Jacques FW5JJ in Wallis and Futuna is another very active operator.

On 160 m, some South American stations have been heard, including LU8DPM Mario in Argentina, worked on 22 June, and LU5OM was worked by VK3EW on 6 July.

A few upcoming activations of note are:

T2 Tuvalu (OC-015) Tom KC0W will be operating HF bands from Tuvalu from 21 July – 18 August. QSL via KC0W direct

6Y6N Jamaica (NA-097) Armin DK9PY will be operating again from St Elizabeth on all bands, CW. He will be "holiday style" from 6 - 20 August. Armin is in Jamaica for the WAE CW Contest 14/15 August, when we won't be able to work him (we may only work Europe in this contest).

CY9C St Paul (NA-094) A group of 12 operators is planning an activation of this tiny island between Nova Scotia and Newfoundland. They will be setting up a site at each end of the island, and plan operation all bands and modes. For more information see *http://www.cy9dxpedition.com/*

YJ Vanuatu (OC-035) Tom KC0W continues his island tour in Vanuatu from 20 August - 21 September.

With most of the June sun being spotless, one might think that Cycle 24 has collapsed. But the opening to Zambia in southern Africa on the afternoon of 5th July 2016 showed that even during the longest spotless period since 2010, there is still some nice DX to be enjoyed.

A handy and up-to-date site to bookmark is NG3K's "Announced DX Operations" *http://www.ng3k.com/misc/adxo.html*

Please drop me a line with your DX experiences to *vk3hj@wia.org.au*

73 and good DX,

Luke VK3HJ.

Participate

VK1 Winter SOTA QSO Party | 7 August 2016

VK1 SOTA activators showcase amateur radio to the ACT community.

VK1 SOTA activators will brave the cold Canberra weather, ascending local and distant SOTA peaks for a chance to work like minded SOTA folk around VK.

The VK1 Winter SOTA QSO party is a popular event with chasers and activators alike where SOTA activators compete with chasers to earn Summit to Summit contact points.

VHF/UHF - An Expanding World

David K Minchin VK5KK

Introduction

The VHF bands were not quite dead mid-winter; first up we have a report on Sporadic E (Es) on 50 MHz to Europe from VK4 along with more over the land Tropo on 144 MHz out to 1600 km! Also we have a full report on the 2016 VK "Microwave DXpedition" to DL, OE HB9 and HB0. This month's technical corner we have a report on the SDRA conference in Germany as well as Kevin VK4UH's Meteor Scatter report.

50 MHz Sporadic E to Europe from VK4

Yes the title is correct, Europe to VK4 mid-winter Sporadic E on 50 MHz!

As reported by DUBUS editor Joe DL8HCZ/CT1HZE *"On June 8, 0620Z-0700Z, VK4MA from QLD worked DL, F, OZ etc on Multihop Es mainly (may be some TEP on his end involved). The distances were up to 16500 km! The entire path was in daylight. VK4MA heard/worked UK8 and JT at the same time. Amazing!"*

What was suggested to be "TEP" almost certainly was multi-hop Sporadic E almost half way around the world. Roger VK2ZRH clarified the non-existence of a TEP event a few days later *"I took a look at the Equatorial Ionospheric Anomaly (EIA) parameters both north and south of the geomagnetic equator for the opening. Would not support TEP at 50 MHz, or even N-mode (Es-F).... Gotta be Es all the way."*

Talking to a few operators at Friedrichshafen put some more perspective around this Es opening. From the last week of May till mid-June, there were a number of super multi-hop Sporadic E openings on 50 and 144 MHz rights across Europe. On 7 June (the day before), over 100 US stations were worked from Portugal on 50 MHz, the longest distance was 7950 km. On 8 June there was a super 144 MHz Es opening right across Europe from Scotland to Russia, Norway to Italy. At least 1,000 QSOs were logged on ON4KST for this single event on 144 MHz over two hours, most likely the biggest recorded 144 MHz Es opening ever!

There are previous reports (2009) of Es from Europe to Japan, and there are quite a few contacts where Sporadic E extensions have helped. And no doubt this has happened before but no one was around! Clearly we need to keep an eye on the ON4KST reflector for unusual Es events in the northern hemisphere. A full report on European Es in this period will appear in DUBUS 3/2016.

2016 European Microwave "DXPedition"

Some would say it is a bit like "Carrying coals to Newcastle" but for the second year running Alan VK3XPD, Iain VK5ZD and David VK5KK packed up 60 kg of microwave equipment for the trip to the Friedrichshafen Ham Radio Convention. We planned to operate from various points in Austria, Germany, Switzerland and Liechtenstein over a seven day period. Microwave bands activated by the VK5ZD/KK team were 1.2 (2 W), 5.7 (5 W), 10 (4 W), 24 (0.2 mW!), 47 (30 mW) and 76 (5 mW) GHz.

Mass was the number one problem. Each band needed a transverter with as much power as we could use portable to maximise our chances. Some equipment was rebuilt into lighter versions: other equipment like 1.2, 5 and 10 GHz was the same as last year using 300 mm square patch panels. Would have loved to take a Geelong 3.4 GHz transverter but we had no room left! The one 300 mm Nurad dish antenna was shared across the 24/47/76 GHz; the compromise horn feed on 76 GHz did sting performance however. I had to make the choice between the 5.7 GHz transverter and the Miller head (same mass 3.5 kg). Ultimately the Miller head had to stay and was replaced by a simple bolt/sink plug assembly to hold the mmWave transverters. In hindsight, 5.7 GHz was the least popular band (6 contacts), so the Miller head would have been more warranted!

We packed a lightweight camera tripod for the lower bands however airline regulations prohibited us flying with a decent tripod and >100 Wh batteries. Wolfgang OE4WOG and Hans OE2JOM assisted us by purchasing a Bosch BT160 tripod and loaning six batteries, hardware, etc. to us. A 144/432 MHz antenna and Buddipole was also provided! We had plenty of spares and tools to fix things but luckily we had no mechanical damage to gear in transit or failures sans Alan's 47 GHz being DOA.

At Adelaide airport check-in the total mass of the two cases with all the microwave gear was 29.9 kg (QATAR limit = 30 kg), the FT-817, Nurad dish and clothes had to be in cabin baggage! Iain had a commercial HD camera outfit with him, so similarly went close. It was

a different story coming back with some trinkets collected from the flea market but luckily our extra kilograms weren't charged at the usual US$70 per kg rate! We arrived in Munich 21 hours later via Doha. We picked up the hire car after the usual negotiation about not paying an extra 12 Euro per day for a GPS that was standard in the car to which we had been upgraded! The first stop was Hans OE2JOM's QTH just outside of Salzburg to collect everything else we needed.

The first part of the DXpedition was to operate from Schafbergspitze about 50 km east of Salzburg. This is a popular microwave spot in Austria, the top of the 1783 m mountain is a Berghof built right on the cliff (see photo!). Historically, world records have been set over the years on 47, 76 and 122 GHz from the summit. It has a great take off toward Germany and the Czech Republic as well as some very high mountains up to 120 km away in Austria.

On Friday 17/6/16 (Day 1) we went up the mountain. The only way to go up the mountain is via a steam cog train, at this point with batteries, tripods, etc. we now had a combined total of over 100 kg of luggage! Operation on the first day was restricted to 10 GHz as our partner stations OE4WOG, OE2JOM and OE5VRL were still in transit to their portable sites in Northern Austria. VK5KK worked a number of southern DL stations; the longest contact was with Daniel DL3IAE via rain scatter 450 km. We did work Rudi OE5VRL on 47 GHz late in the day, 59 signals both ways over 93 km. We were also able to copy the OE5XBM 47 GHz beacon 529 over ~100 km. The beacon runs 30 mW to a 20 dBi horn antenna. The beacon can be DTMF commanded on 2 metres to point 24/47/76 GHz in your direction. 47 GHz has been heard over 280 km in the past year!

Day 2 (18/6/16) was cool (12 C) with high humidity. The predicted storms for the morning didn't eventuate so we were in full swing.

Photo 1: Portable location at Schafbergspitze in Austria above a 1000 metre high cliff!

Rudi OE5VRL/P was portable near Linz (93 km) and Wolfgang OE4WOG/P, Mircea OE/YO5AXB/P, Erno OE/HG5ED/P were portable near Perg (106 km). Contacts were made on 5.7, 10, 24 GHz and 47 GHz with 59 signals over the paths. Even the 24 GHz 200 uW bare mixer system was 51 over 106 km. Erno HG5ED had travelled from Hungary with his own 47 GHz equipment, despite only running less than 1 mW with a bare mixer, he was 57 on SSB.

76 GHz was a different story; OE4WOG/P's and OE/VK5KK/P had very weak signals both ways over 106 km so no contact. OE5VRL was stronger (CW, 519) over the shorter (93 km) path; this was the longest 76 GHz contact for the trip. Whilst summer humidity was a factor on 76 GHz, we later discovered that the oversized horn feed on 76 GHz (designed for 31 GHz) wasn't optimum. A week later we did a test over short range (6 km) on 76 GHz between Alan VK3XPD's 300 mm Nurad using the same feed and Wolfgang OE4WOG 400 mm machined dish and feed. Even after factoring size and power differences, the Nurad system was 15 – 20 dB down and clearly under illuminated. Late in the day thunderstorms were all around the mount so we packed everything up.

Day 3 (19/6/16) we woke up "in the clouds" with visibility 10 metres at best! Nearly every weekend in Europe there is a contest of some sort, from 0700 UTC the Austrian/ Slovenian/Italian VHF/UHF contest was on so VK3XPD and VK5KK had contacts on 144/432 and 1296 MHz. Numerous attempts made over 300 - 400 km paths to various S55 on 10 GHz but no rain scatter. Clearly you have to be under the clouds to work rain scatter! As it was now raining more, we suspended microwave activity. Later in the day we did manage to work Christian DL3MBG/P (DARC president!) on 10, 24 47 and 76 GHz over 57 km between thunderstorms. Day 4 we left the mountain still in cloud. The only contact for the day was OE4WOG/P working Alan OE/ VK3XPD/P on 122 GHz across the Wolfgangsee (lake), 2.4 km on SSB 41. We headed to Germany (Meersburg).

Day 4 (20/6/16) we decided to do some specific experiments on 24, 47 and 76 GHz across Lake Konstanz. What we were interested to see is how evaporation ducts impact/enhance mmWaves based on what we have found on 10 and 24 GHz sea level paths in VK. Ideally you need wind across the path and some vertical temperature differential hence it tends to work better in the morning.

Photo 2: Lake Konstanz 47 GHz over water path at the Swiss/German border.

The path we picked (see Photo 2) is about the longest all water path across the lake (44 km) we could access by road. VK5ZD/KK located at Konstanz on the DL side of the Swiss border at water level, Wolfgang DL/OE4WOG/P located at Bregenz at a lakeside Cafe! Antennas at both ends were effectively two metres above the water and far from radio line of sight. 10 GHz worked fine but had typical QSB, 24 GHz was good but 47 GHz was a stand out. Factoring in the various power and gain factors 47 GHz was the best band, still 59 with just the bare horn antenna! 76 GHz was well down with very bad scatter, 31 on SSB. I know of similar contacts on 47 GHz across Port Phillip Bay in VK3 with good signals, we are now looking for longer water paths here in VK to try this out! Wolfgang moved up the mountain to a Hotel near Pfander afterwards (600 metres higher). We successfully worked him on all bands up to 47 GHz using bare horn antenna and 76 GHz on the dish.

Later in Day 4 we travelled to Liechtenstein (HB0), a small "principality" (pop 35,000) surrounded by Switzerland and Austria. HB0 is south of the lake by about 35 km and basically in a valley with a 2 degree window back to Germany even from its highest accessible point (850 metres). We had figured that HB0 may have been worked from OE and HB9 across the borders on mmWaves but not on 24/47 and 76 GHz to Germany given the hills in the way. So taking up the challenge, Iain and I drove through the back blocks of Switzerland arriving at Planken in HB0 around 1400 UTC. The first spot we picked on Google Earth turned out to have trees in the way as happens; it took another hour to find a location higher up with a clear take off into the mist. We had bumped into the cloud and rain again but worked OE4WOG/P still at Pfander on 10, 24, 47 and 76 GHz (CW 519) over 45 km.

Wolfgang then drove to a spot just inside Germany at Lindau to work us from DL. During this time one of the local residents had a chat with us to see what were up to. The chap had good radio knowledge, long story short it turned out to be Stefan HB0TR and we were parked in the empty block next to his QTH! Around 1700 UTC Wolfgang was set up in DL, we worked on 10, 24 and 47 GHz OK but noted signals were much weaker on the upper bands. 76 GHz was very weak so no QSO. We packed up and headed to Lindau for a late meal and debrief with Wolfgang. It was then we discovered that we had a hill just cresting the path right in the middle, neither party could see as visibility was less than 10 km!

Day 5 (22/6/16) we woke up to a clear day, the first time we had seen the top of the Swiss Alps since arriving! We contacted Wolfgang and decided on an alternative location in DL right next to the Lindau Golf club (Wolfgang gets all the good locations!). We detoured on the way to HB0 to find Wolfgang set up in a perfect spot in a field next to the golf club. Once we identified common geographic references for bearings we headed off the same spot in HB0. This time we worked 47 GHz with much stronger signals, 59+ on a bare horn over 45 km. 76 GHz we managed SSB 51 both ways.

We then travelled to Switzerland to a place near Arbon to repeat our over water contacts of the previous day but over an oblique

Photo 3: Iain HB0/VK5ZD/P working DL/OE4WOG/P on 76 GHz from Liechtenstein.

22 km path with Wolfgang at an elevated site above Lindau. It was late afternoon with plenty of wind now. We managed contacts on all bands but the evaporation duct this time had a negative effect on signals with wild QSB variations on 24 GHz and above. On 47 GHz we detected signals at two elevations, one at water level and the other about 2 degrees up. Also on 47 GHz we experienced a rapid (100 Hz) almost triangle wave buzz on signals. Initially we thought we had a switch mode supply going berserk! It turned out that Wolfgang was looking directly through a large church roof and spire, moving 100 metres to the right the effect disappeared.

A great experience, this time pushing the limits a bit more above 10 GHz. We are told the best time to operate on mmWaves in EU is in the middle of winter (dry air obviously), I'm not so keen on the snow aspect though! The rest of the trip we spent time at the Friedrichshafen (FN) Ham Radio show where we met with a number of VHF and above operators as well as VK2, 3, 6 and 7s during the three days. Next year the event will be later (July 14 - 16). For more information go to *www.hamradio-friedrichshafen.de/ham-en/*

SDR on VHF and above - Part 5

This month we have a short report on the SDRA 2016 conference in Friedrichshafen, Germany on Saturday June 25th, 2016. This was the second year the SDRA conference has been run in Germany on the Saturday of the main FN convention. This year 15 speakers (including Phil VK6PH and myself) presented on a wide range of SDR subjects ranging from basics to new concepts and alternative hardware/software. A lot of very interesting ideas were presented to a full lecture theatre, most of which are already SDR users from the hands up survey in the opening address. The following is just a snippet of what was presented; HD video of all presentations will be on YouTube once edited by the organisers.

Phil Harman VK6PH presented in the OpenHPSDR section on an alternative architecture for SDR using Direct Fourier Conversion (DFC) instead of the more usual DDC (in a FPGA). DFC can be handled by commonly available high performance PC Graphics Processing Units (GPUs) at a fraction of the cost of a FPGA to do digital down conversion! Phil presented the some practical examples and how this can be used with OPENHPSDR software for a low cost SDR system. David VK5KK presented an update on the mcHF project as well as the VHF/UHF transverter driver project.

Also in the OpenHPSDR section John Melton, G0ORX presented on Stand-Alone HPSDR Transceivers using low cost small format ARM based PCs. John presented two working examples using Raspberry Pi2 with 5" and 7" touch screens running Rasbian and piHPSDR. John also had a prototype LimeSDR he has been working with to control with piHPSDR. There is already some software on Github you can try. For more information go to Johns website *http://g0orx.blogspot.com.au/*

The Lime SDR was clearly flavour of the month at the SDRA conference although only one example was about (and not connected up!). The crowd funding campaign was successful in raising over US$0.6M so a batch is underway for 30/11/2016 delivery. Lots of ideas were discussed on what you could do with a 3.8 GHz SDR board with two receive and two transmit ports. Over 50 Australians are on the list of buyers, so far so no doubt we will see some close to home ideas. They are now being sold for US$289.00 online for delivery late this year, still a good price seeing the single unit price for the main chip is more than that. For more information go to *http://www.limemicro.com/*

For more information on the SDRA 2016 conference please go to *http://www.sdra-2016.de/pages/programme.html* Links for videos may take a bit of time to appear as they did for last year!

More winter Tropo...

Similar to the May opening reported last month there has been more inland Tropo DX with another stable high sitting over mid VK2 early July 2016.

From Peter VK5PJ's post on VKLogger *"On July 2nd (election night) the VK4RTT beacon was up to S5 at my location but attempts at contacts with a VK4 station did not work out. I was not aware of how well placed VK4RTT was in relationship to the greater Brisbane area, turns out the Great Dividing Range does a good job at attenuating VHF signals from VK5.*

Hepburn did not show anything special for the opening but as per other occurrences I have heard about, the weather systems were all very calm and not much was moving. Indeed the weather at home for those few days was very calm and settled on Saturday night when I checked VK4RTT beacon and could hear it keying away."

In closing

That's it for this month. Feel free to drop me a line if you have something to report. Contributions regarding club projects or proposed activities are always welcome. Just email me at *david@vk5kk.com* and I'll include in the column.

73

David VK5KK

Meteor Scatter Report

Dr Kevin Johnston VK4UH

In the June *AR* Meteor Scatter column a description was given of the updated version of the MSHV software package from Christo LZ2HV. This new version (ver. 1.05) supported a whole raft of available

modes for Meteor Scatter operation across most commonly used bands. Since I published that article things have moved on rapidly. In the interim, Christo released a further updated version (ver. 1.19) which included MSK144, alongside JTMSK; both new fast Meteor Scatter modes under development.

From information posted by Bill G4WJS: *"JTMSK is a first attempt at an FEC'ing (Forward Error Correcting) meteor scatter mode, suitable for 6 and 4 metre operation. The mode provides accurate and robust decodes due to the FEC parity information added to the messages. The new mode MSK144 uses an even more advanced FEC system (LDPC) build on the initial work of JTMSK. As it is more efficient than JTMSK it will probably be better suited to 2 metres where reflections are generally shorter than on the lower frequency VHF bands."*

A number of VK stations successfully installed the new version of MSHV and there have been a few successful contacts made. On 11 June the author VK4UH (QG64kp) made what was probably the first VK-VK contact on 6 m with Arie VK3AMZ (QF22FE) using MSK144 mode. The on-air results were quite promising.

Those interested in trying the new mode for themselves may unfortunately have to wait a while for its general release. MSHV ver. 1.05 was withdrawn from Christo's website with a gracious personal apology from the author. He had been asked to do this by the protocol authors of the new modes as JTMSK, JTMSK+Sh and MSK144 were thought to be at such an early stage of development that there was concern not to give the new modes a poor report due to *"possible bad performance"*. Hopefully the new modes will be rereleased in due course to allow a more widespread appraisal of their usefulness.

There are also a few references in the wind to another new mode called "QRA" although details are sketchy at the time of writing.

For those interested in comparing the data transmission rate of the Fast Meteor Scatter modes:

JTMSK	286 cps
JTMS	197 cps
FSK441	147 cps
FSK315	105 cps
ISCATA	16.15 cps
ISCATB	32.3 cps
JT6M	14.4 cps
MSK144	?

MSHV software is available from *http://lz2hv.org/mshv*

General conditions for meteor scatter operating have remained average-low for the winter months.

There was some enhancement around the weekend of 10-11 June possibly caused by the Arietids Meteor Shower. The astronomical source of this shower is unknown but the shower is unusual as it is one of the few daytime visible showers.

Although we are still in winter the solstice, and the shortest day for us in the Southern Hemisphere, has now passed. The days get longer from here on in and spring, with its anticipated improvement in conditions, is on the way. By the time this report is printed the Perseids Meteor shower will have passed. Any reports on this shower would be appreciated.

The next significant Meteor Showers on the calendar will be:

Orionids: peaking around **22 October.**

Leonids: peaking around **17 November.**

Dr Kevin Johnston VK4UH
Brisbane

Silent Key

Bruce Wilson OAM VK3IG

Sadly Bruce VK3IG passed away on 14 May 2016 after a short battle with cancer. He fought it with great humour and dignity until the end. He was born on 19/9/1940 in Melbourne and spent his early childhood in the suburb of Ormond before commencing work for what was known then as the PMG as a trainee technician in January 1957, based at the training school in Batman Street Melbourne.

The first 12 months were spent at the school whilst the remainder of course was divided between the school and on-the-job training at various PMG establishments. Trainees were divided into various groups including telephone, telegraph and radio with Bruce allocated radio finishing up at Radio Australia in Shepparton, ultimately as the CEO.

Rex Wales (SK) was the radio instructor at the training school who coached a group of us in obtaining Limited licences; Bruce's initial call sign was VK3ZKW: he operated on 6 metres.

Bruce was best known for his contribution to local government and his active work in the community through many different organisations and committees. Former member for Murray Bruce Lloyd said Bruce had a decorated civic career and was deservedly rewarded for his services.

He also mentioned Bruce's many achievements such as becoming the youngest councillor to be elected to the City of Shepparton in 1970, mayor in 1975 and being the inaugural mayor of Greater Shepparton in 1997 after council amalgamations.

Bruce's community devotion, both voluntary and as a councillor, was recognised with an Order of Australia Medal in 2011.

He is survived by his children: daughter Jenny, son Neil and grandchildren. His wife Elaine pre-deceased him in 2013.

I wish to thank the following for assistance in preparation of my article: Ken Nisbet VK2KP, Rod Champness VK3UG, Peter Wolfenden VK3RV and Peter Milne VK3DV.

Vale Bruce.

Bob VK7FRKL (Cousin to Bruce)

VK7news

Justin Giles-Clark VK7TW
e *vk7tw@wia.org.au*
w *https://groups.yahoo.com/neo/groups/vk7regionalnews/info*

Congratulations

Huge congratulations to John Bates VK7RT on receiving a Wireless Institute of Australia (WIA) President's Commendation at the WIA AGM on Norfolk Island. John was VK7 QSL manager for 18 years from 1997 up until August 2015 and did a great job of streamlining and improving the administration of the VK7 QSL Bureau. Congratulations John.

Congratulations also to Ian Ellings VK7QF who was recognised at the AGM for 10 years of service as an accredited assessor for the WIA and the Radio and Electronics Association of Southern Tasmania. Congratulations Ian.

North West Tasmania Radio and TeleVision Group (NWTR&TVG)

Congratulations to Danny and Peter from the Sheffield area who, at the time of writing, were waiting for callsigns VK7FWRG and VK7FPRN. A general meeting of NWTR&TVG was held on June 4 2016 with a focus on social events for the future including the Hellyer Car Rally, Equine Endurance events, ILLW participation, APRS and fox hunts.

VK7 Regional News Statistics

The WIA AGM signals the start of the WIA and VK7 Broadcast year. Therefore it is a good time to look back on a summary of the broadcast and rebroadcast callback statistics in VK7. See Table below.

Northern Tasmanian Amateur Radio Club (NTARC)

Kevin VK7HKN was seen at a recent coffee morning with butane cigarette lighters, paper-clips and masking tape and instructions for making emergency gas soldering irons. On ya Kevin!

The NTARC June meeting was postponed due to the terrible flooding in the North and North West of VK7. The revised meeting saw some great show and tell from Joe VK7JG with a verbal trip into outback VK5 and VK8 with his brother. Joe also showed his converted 3.4 GHz microwave Wi-Fi unit made popular by the Geelong Amateur Radio Club. Bill VK7MX demonstrated his Signal Stick dual band whip made of Nitinol wire and a CHIP computer with better specs than a RaspberryPi, half the size and a much lower price! Kevin VK7HKN showed his completed VK3YE Knobless Wonder kit and Alvin VK7ADQ finished by showing his JBL Bluetooth audio amplifier. NTARC recently purchased a Yaesu DR-1X digital voice repeater box that was also shown on the night followed by a sumptuous supper.

Radio and Electronics Association of Southern Tasmania

Congratulations to Angela, Craig, Greg, Richard and Randall who all passed their Foundation licence assessment at a recent training and assessment session. We look forward to hearing you on the air.

On the weekend of 18 June 2016, REAST hosted ALARA (VK7)

Photo 1: Larry VK7WLH presenting on HF Magnetic Loops. (Photo courtesy of Ben VK7BEN.)

2 m	70 cm	80 m	40 m	ATV/ Streaming/ VOIP	6 m	10 m	20 m	Total
3118	465	432	327	308	278	272	214	5414

Photo 2: 23 cm Yagi (recent REAST Club project) beaming toward the Organ Pipes. (Photo courtesy of Justin VK7TW.)

Photo 3: SG-Lab 23 cm Transverter. (Photo courtesy of Justin VK7TW.)

for a Sharing the Hobby lunch. With three licenced YLs, three unlicensed YLs and four OMs it was a great group and we introduced the hobby, experiences, ALARA, training, clubs and the many activities this great hobby offers. One participant was heard on the ALARA net using EchoLink the week after and another successfully undertook the Foundation Licence assessment and passed – Congratulations to Angela.

REAST's June presentation was given by Larry VK7WLH on Magnetic Loops and Larry took the audience through these compact antennas and the challenges of constructing, tuning and operating. Thanks Larry.

The 23 cm QSO parties are continuing with regular participation from five or six amateurs each Sunday after the VK7 Regional News broadcast. The author has started participating after purchasing a Bulgarian SG-Lab 23 cm Transverter on advice from Alan VK7KAJ. The group starts on FM, moves to SSB then to WSJT to Northern VK7 and VK7JG when he is available. Around Hobart the group uses the passive reflector of the Organ Pipes (iron rich dolerite) on Mt Wellington and all beam toward them.

Our DATV Experimenter's nights have seen Warren VK7WN with a presentation on the recent RAAF airdrop to Casey Station in Antarctica. Ben VK7BEN demonstrated the Open Broadcaster Studio software. The author showed a Gas lock ultrasonic gas cylinder measuring gadget. RaspberryPi Infrared low light camera and IR lamps assembly, French TGVs, wind bent antenna poles, 10 GHz pre-amplifier, Yttrium Iron Garnet low phase noise oscillator for 10 GHz and DUBUS reviews. Passive RF reflectors – link budgets and real world examples, review of the Circuit Cellar magazine and historic pictures. Our videos included LimeSDR, Antarctic Division videos, Dark MOFO, AmateurLogic.tv and much more.

VK3news Geelong Amateur Radio Club

Tony Collis VK3JGC

Oceania 2015 Award

For the **fourth consecutive year** the GARC has won the **Australia Club Plaque** Oceania Award.

Specific GARC member achievements

- Phone Single Operator All Bands Low Power (< 100 W) were Ken VK3DQW, Bert VK3TU. Chas VK3PY at 11th, 13th and 16th respectively.
- Phone Single Operator All Bands High Power (100 W) were Ken VK3NW ranked 3rd and Andre VK3AVZ ranked 22nd.
- Phone Single Operator Low Power 40 m Rod VK3OB ranked 2nd
- Phone Single Operator High Power 40 m Peter VK3WK ranked 1st.

Annual Solstice Dinner

The dinner, attended by club members and partners totalling 41, was hosted this year at the house of Peter VK3WK and his wife Madeline in Lara, Geelong. Peter's wife Madeline, with input from Jenni VK3FJEN, worked tirelessly to produce a magnificent three course buffet, which was greatly appreciated by all present.

As previously planned for that evening, President Lou

Photo 1: President Lou VK3ALB presenting Bert VK3TU with his Life Membership Certificate.

VK3ALB announced a new **Life Membership** for the Club. In line with the constitutional requirements, a meeting had been held on the Wednesday evening prior to the Friday Solstice dinner to vote on a motion to elevate **Bert VK3TU** to Life Membership of the GARC.

The vote was unanimous for the enormous services he has rendered to the Club, both in a material and personal context.

During the course of the evening there was a presentation by **Ray VK3ACR**, completely unexpectedly, of a **magnificent donation** to the Club, that President Lou VK3ALB gratefully accepted.

Roof Replacement to the GARC Club House

During June the second half of the Club house roof was replaced after some 60 years of service. The GARC would like to acknowledge that the *City of Greater Geelong Grants Scheme* kindly donated **$1,650** towards the overall costs and that **Ken VK3NW** also donated a personal cheque for **$1,000.** When the original roofing was dismantled the extent of the damage became very apparent and that the re-roofing was very timely....

Photo 2: The new roof adjacent to the west tower of the GARC Club house.

The Australia Club plaque is awarded to the local club from Australia with the greatest number of member stations making at least 50 valid QSOs in the PHONE or CW sections in the contest. The **Geelong Amateur Radio Club** wins this plaque again in 2015 with a total of 17 eligible logs being submitted from members **VK3ALB, VK3ARG, VK3BCL, VK3BYS, VK3DQW, VK3FJEN, VK3FUNY, VK3FWGR, VK3LCD, VK3NCC, VK3NRW, VK3NW, VK3OB, VK3PY, VK3TU, VK3WK** and **VK3ZIB**. Another great effort from the cub and it is pleasing to see several Foundation Licensees contributing to the outcome. The runner up was the **Eastern and Mountain District Radio Club** with its members submitting 13 eligible logs (up from 11 in 2014).

Figure 1: Extract from the Oceania DX Contest Award listings.

ALARA

Christine Taylor VK5CTY – Publicity Officer

ALARA on Norfolk Island

ALARA was very well represented on Norfolk Island. The meeting with Kirsti was excellent. Her introduction to EchoLink was new to her and worked very well even though really, only Bev VK6DE was there to talk to Kirsti and those of us on the island. The fact that Bev has visited Norfolk Island five or six times and keeps in touch by email with Kirsti made it special. It is distinctly possible that Kirsti's introduction to EchoLink will have encouraged her and Bev to use that method of communication in the future.

Photo 1: Kirsti VK9NL using EchoLink at the Paradise Hotel (courtesy Robert Broomhead).

However that was not the only radio activity indulged in by Shirley VK5YL. She was thrilled to make a contact on an entirely new band, while she was there. Shirley had a microwave QSO, on 3.4 GHz from Mount Pitt. She was using an FT-817 radio with a transverter to 3.4 GHz. The radio was taken to Norfolk Island by Keith VK5OQ.

Photo 2: VK5 radio amateurs at Norfolk Island Bowling Club.

AWARDS given at the WIA AGM relating to ALARA

Congratulations to all.

Peter Wolfenden VK3RV	*Michael J Owen Distinction Award*	Recognising Peter's exceptional voluntary service for the WIA over many decades. In particular, his significant role as Coordinator of the Historical and Archive Committee and noteworthy contribution of articles to *Amateur Radio* magazine on Australian amateurs' roles in WWI and WWII, for the ANZAC Centenary over 2014-15.
Jenny Wardrop VK3WQ	*Chris Jones Award*	For Jenny's consistent support of the WIA and ALARA over five decades, as well as her historical research work, particularly on women in amateur radio. Notably, she contributed the "YLs at War" series of articles to *Amateur Radio* magazine for the ANZAC Centenary over 2014-15.
Peter Wolfenden VK3RV	*Al Shawsmith Award*	For a series of well-researched, interesting and informative history articles throughout 2015 about events related to and during WWI and WWII, in the lead-up to the 100th Anniversary of the ANZAC landings. He also assisted other authors with their ANZAC history articles.
June Sim VK4SJ	*President's Commendation*	For her long-term support of the WIA and Queensland amateurs, initiative in organising DXpeditions to southern hemisphere islands, support for local and international emergency exercises on HF and for serving as VK4 QSL Bureau Manager over recent years.
Jim Tregallas VK5JST	*AR magazine Technical Award*	For his article, "A VHF/UHF Aerial Analyser", published in the December 2015 issue of *Amateur Radio* magazine.

Photo 3: Shirley VK5YL using VI9ANZAC on Norfolk Island.

The contact was with Roger VK9NJ (aka VK2ZRH) at Kingston, line-of-sight. It is the very first such frequency Shirley has tried out.

Shirley and several other YLs used the Special Event station VI9ANZAC as the photo here shows. With ten contacts on that station she has earned a certificate to put on her brag board.

A fuller report of the activities of the ALARA members at the AGM can be found in the Newsletter. Suffice it to say we had a great time there and would recommend others to visit there, whether you are interested in beautiful countryside, an amazing abundance of flowers and birds or if you are interested in the history of the island, there is something there for you.

SK Notices

Two ALARA SKs that happened while we were on the Island.

Jessie VK3VAN: a member almost from the beginning of ALARA and held the positions of Secretary and Sponsorship Secretary in those early days. Jessie and Bron VK3DYF used to travel all the way from Rosebud to meet with Mavis VK3KS and Gwen VK3DYL and any visiting YLs once a month in Melbourne city: A long trip just for a luncheon.

Jenny VK3WQ has written a longer Obit for **Mavis VK3KS** as both of them were foundation members in 1975. Mavis was the first Honorary Life Member of ALARA.

They will both be missed very much.

ALARA'S birthday lunches

ALARA will be 41 this year, so lunched will be held to celebrate the occasion. In Adelaide the luncheon will be on Sunday 24 July 2016. For the venue and for details of when and where the other luncheons will be held is available from your State Reps.

It is usual to have a special Birthday net on the Saturday evening before the birthday luncheon. This time it will be held on EchoLink so we hope lots of old and new members will come up to wish each other "Happy Birthday".

The ALARA Contest

This held over the last weekend in August. It runs from 0600UTC August 27th on to 0559UTC on August 28th. All HF bands except 160 metres and the WARC bands are permitted, as well as EchoLink and 2-metres. Contacts between the same stations may be repeated after at least one hour.

It would be preferred that separate logs are made for EchoLink and 2-metres and logs should be sent to Diane VK4DI. The full details are printed in this issue of *Amateur Radio*.

Please do participate, it is a contest that allows you to have a chat as well as fill your log book.

Are you planning an overseas trip in 2017?

If you are thinking of going overseas next year here is something to add to your itinerary. CLARA, the Canadian Ladies Amateur Radio Association, is planning a Birthday Bash to celebrate their 50 years in amateur radio, in July 2017. The MEET will be in Winnipeg, Manitoba for July 17-20 2017. Information about the Birthday Party will be on the CLARA, YLRL and BYLARA websites – maybe it will be on the ALARA website as well, shortly.

Winnipeg is close to the border between Canada and the US, so it is a good "jumping off" spot for any tours of either country. If you plan to do the Canada Alaska tour or the tour of the US National Parks, both of which I did a couple of years ago, a visit to Winnipeg could be a starting point. Alternatively if you want to tour the Eastern States of the US or to travel on a train though the Canadian Rockies, again, Winnipeg would be a good starting point.

Think about it seriously, especially if you have, or even if you have not been to a YL International Meet. They are a great way to make friends all over the world.

REAST/ALARA Lunch: Sharing the hobby

Linda VK7QP reports: Last Saturday, 18 June 2016, we held a

Photo 4: Kirsti VK9NL and ALARA visitors on Norfolk Island (courtesy Robert Broomhead).

Photo 5: REAST and ALARA sharing the hobby.

lunch jointly organized by REAST (Radio and Electronics Association of Southern Tasmania) and ALARA (Australian Ladies Amateur Radio Association). We had promoted the lunch as 'sharing the hobby' and this is how it turned out. All the ladies present were wives/partners of licensed radio amateurs. Justin VK7TW led the session for REAST, while Linda VK7QP and Rosanne VK7NAW were the ALARA members present.

We started the day with introductions all round. It was clear that our guests were familiar with amateur radio to some extent already. One had gained a Foundation licence but was not very active. Others either had just not considered getting a license until recently, or not at all. In total we had three licensed YLs, three unlicensed YLs and four OMs. This was a good size for the venue, the REAST club rooms on the domain, and for us all to be able to get to know each other.

Justin gave an overview of all the different activities available to amateurs, including SOTA, contesting, amateur television and WICEN. Linda gave a demonstration of EchoLink. This is one of the main ways that ALARA members regularly communicate with each other. Thanks to Kaye VK3FKDW, Shirley VK5YL and Tina VK5TMC for coming on air to give us a contact.

Reg VK7KK is one of the trainers for REAST. He talked to the group about the requirements for the Foundation License, and how it could be achieved by studying the manual and attending a day's training session.

Thanks to REAST for providing a tasty lunch and a venue for the event. Particular thanks to Justin for organizing the activity and his excellent presentation.

SK Mavis Ellen Stafford VK3KS

11-9-1921 to 5-6-2016

Photo 6: Mavis Stafford at the 70th Anniversary in 2009.

Mavis grew up on a farm, in the small settlement of Lallat North, a few miles from Rupanyup, in the Victorian Wimmera region.

In 1936 a new teacher came to take charge of the local school. Mavis' parents always boarded the teacher to help keep the school open. She had never heard about amateur radio until then but when Ivor Stafford, the teacher, set up his radio gear, Mavis' brother Artie became very interested. Ivor VK3XB started teaching Artie the theory and Morse; unbeknownst to them Mavis learnt the Morse code too.

When things weren't going so well on the farm, Artie moved away to find work and Mavis became the pupil. She passed her AOCP exam on 30 May 1939, and obtained the callsign VK3KS on 6 June 1939.

In 1943 the pupil married the teacher and in 1946 their first child, Geoffrey, was born. In 1947 Ivor decided to move to Melbourne to do a University course and in 1951 they moved into their own home at Box Hill, where they lived for 40 years. Lynette arrived six weeks after they moved in and Russell was born three years later.

In 1953 Ivor became the Victorian Outwards QSL Officer and Mavis helped with the preliminary sorting and posting of the many packets of QSL cards, much to the annoyance of the local post office lady who had to weigh them!

Photo 8: Mavis as she appeared in the RAOTC magazine.

Photo 9: The plaque awarded to Mavis by ALARA in 2009.

Mavis and Ivor were both keen contesters and award chasers, often staying up all night to work the elusive stations. Mavis alone won eight gold cups, one silver, six plaques and over one hundred YLRL (USA ladies) certificates. She also gained her DXCC, WAZ, WAS YLDXCC and in doing so, made friends all over the world. Her list of achievements are too numerous to mention.

In 1966 she was honoured to be invited to join the First Class CW Operators Club, one of the few women to do so. It required sponsored by five members, and being able to send and receive Morse at 25 wpm.

Photo 7: The family QSL Card.

Photo 10: WIA President's Commendation certificate 2009.

Mavis was one of the founder members of ALARA, later becoming the Historian after she suggested that "someone should write down the History before it was forgotten"! She also became the Award Custodian, a position she held for over eight years. In 1983 Mavis became ALARA's first Honorary Life Member.

Other YL organisations to which Mavis belonged were CLARA (Canada), WARO (New Zealand), YLRL (America), YLISSB (also America) and JLRL (Japan). She was a WIA member, and since 1976, RAOTC member number 62. At the time of her death Mavis was the oldest RAOTC member.

Over the years, many ALARA meetings were held at her home, as well as YL gatherings for DX guests who visited. When Mavis and Ivor were down-sizing to move into a retirement village in 1990, they gave Ken Matchett, the WIA's QSL Card Custodian, 25,000 QSL cards!

In 1989 ALARA gave a surprise lunch party for Mavis at the home of Gwen VK3DYL and presented her with a sheep-skin rug for her operating chair. This was in recognition of her achieving 50 years in amateur radio. Twenty years later, in June 2009, another special lunch was held in Melbourne to recognise her 70 years in amateur radio. On this occasion Mavis was presented with an attractive plaque from ALARA, and a President's Commendation Certificate from Michael Owen, WIA President.

Mavis epitomised ALARA's aims, to encourage women into amateur radio and to support them through friendship.

Jennifer Wardrop VK3WQ
20-06-2016

VK3 news Eastern & Mountain District Radio Club

Peter Hartfield VK3PH

Results of the Annual General Meeting

The club AGM was held on Friday 3 June 2016. All committee positions were declared vacant and then the following team was elected unopposed:
President: Andrew Scott VK3BQ
Vice President: Damian Ayres VK3KQ
Secretary: Peter Hartfield VK3PH
Treasurer: John Longayroux VK3PZ

Eight general committee members were nominated. They are David Green VK3DGN, Roger Baker VK3BKR, David Scott VK3FMPW, Marshall Graham VK3MRG, Trevor Scott VK3VTX, Bob Duckworth VK3AIC, Jaimie Hall VK3TZE and Layton Moss VK3CLJ. The incoming committee wish to thank those that served last year and did not wish to continue on this year's committee.

As is the tradition at the AGM, several awards are presented to those that have contributed to the club and/or the hobby over the year or so.

The Charlie White Award is presented to a member in recognition for service to the club and to amateur radio. This year the award was presented to Ralph Pankhurst VK3LL for his efforts in designing club projects including his Anderson "Johnson" Kit, the redesigned hands free kit and the new automated WIA news broadcast device. Ralph received a $75 voucher from Strictly Ham. Congratulations Ralph.

The President's Award is presented to a member chosen by the President for services and support to the club. This year the award was presented to Emma Mackey VK3FTOM for her efforts in taking on and managing the club meeting speaker roster and organising some interesting talks and presentations. Emma received a $75 voucher from Strictly Ham. Congratulations Emma.

Life Membership is awarded to a member who has provided a significant contribution to the club over a long period of time. This year the award was presented to Peter Forbes VK3QI for his efforts with the club contest stations, most recently our VHF/UHF Contest station and many other club activities and support over the years. Congratulations Peter.

Photo 1: Peter Forbes VK3QI receiving his life membership certificate.

Clubroom Meeting – Yaesu System Fusion

On Friday 17 June 2016, Peter Hartfield VK3PH, who has been undertaking some reviews for *AR* magazine, presented a selection of equipment in the Yaesu System Fusion range. He demonstrated the FTM-100DR, FTM-400XDR, FT2D handheld and the HRI-200 WIRES-X internet linking unit. Given that some members were away for the VHF/UHF Field Day and that the weather was so cold and wet, we were surprised at the number of members and guests that attended: about 30 to 40 in total.

Some members brought along their FT1D and FT2D handhelds so we were able to experiment with the group monitor function. Very easy to setup and worked as advertised. Now I will know when those guys are within communications range! More details of the FTM-400XDR and HRI-200 are in the review article in this magazine.

Our next meeting is on Friday 5 August 2016 at the Willis Rooms (Whitehorse Centre, Nunawading). Members and guests welcome.

Cheers for now,
Peter VK3PH

Photo 2: Some of Yaesu's System Fusion range of products.

VK3 news Amateur Radio Victoria

Jim Linton VK3PC
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Achievers get due recognition

The leadership shown in various activities that are part of multi-faceted amateur radio has been long recognised and generally the hobby is practised well throughout Australia.

Let us talk about only two achievers in Victoria, that are getting the attention of those interstate and overseas.

Firstly, there has been years of growth in portable operation through heavy promotion of the Keith Roget Memorial National Park Award (KRMNPA). It was revived when Amateur Radio Victoria had its centenary in 2011.

Driving this challenge is Tony Hambling VK3XV who took on the role of Award Manager and has done a fine job. Plans are now being made towards the KRMNPA activity weekend in November and a boost for the Local Government Award is being considered.

Meanwhile, the activity of Amateur Television through the VK3RTV repeater has long been the result of Peter Cossins VK3BFG although he humbly mentions help he has received.

He had the World DATV QSO Party trialled for the ARV centenary 2011, a mix of digital amateur television and Skype that proved so successful that it is now an annual event.

A lot has been written about his exploits over the many decades. Now he has early plans to fill in coverage of VK3RTV through a relay facility, to broaden its footprint accessibility.

There are so many other Victorians recognised this year by the Wireless Institute of Australia for their contributions that benefit all of us this year, and those honoured by it in previous years.

It not possible to name all achievers recognised this year and previously, but mention of Tony VK3XV and Peter VK3BFG are symbolic of what has been achieved, and gives a teaser on their future plans. Both were on the WIA President's Commendation list this year.

Begin or upgrade with our training

Do you know someone; a relative, work friends or associate; who has shown some interest and would make a good radio amateur or those already with a Foundation licence wanting to upgrade?

The ARV quality training and assessments weekends continue to get new people, plus a few with a professional or hobby interest in communications, who have decided to try modern amateur radio and the scope it offers.

The Foundation licence syllabus is thorough and covers the essential basics of electronics, radio communications, several safety aspects and the regulations. Candidates have to prove their knowledge on those subjects by being competent through a written paper.

Then they undergo a practical test on their knowledge of band plans, regulations, symbols, antennas and then a hands-on ability with a typical radio station, engaging in its set up, testing for power and SWR, on-air use preparation, calling CQ and making contacts.

There is a lot to learn through the training with candidates expected to prepare by reading the updated Foundation Licence Manual available on mail order from Amateur Radio Victoria online shop.

For those who already have a Foundation licence, a Bridging Course for the Standard licence will be run over five Wednesdays at 6.30 pm. It starts on 21 September 2016 and ends with revision and assessments on 22 and 23 October 2016.

To enrol in the Foundation licence training and assessments to be held on 10 and 11 September 2016, or the Standard Bridging Course, both held at the Amateur Radio Victoria office 40G Victory Boulevard, Ashburton, contact Barry Robinson VK3PV *foundation@amateurradio.com.au* or 0428 516 001.

VK6news

Keith Bainbridge VK6RK
e *vk6rk@wia.org.au*

I guess the most important thing about August for me is the NCRG Hamfest. And apart from a couple of other items sent to me this month that's about it. (A distinct lack of input, but I will soldier on).

WARG

We will start this month's column with the latest from **WARG**, the WA Repeater Group.

On behalf of the West Australian Repeater Group (WARG), Secretary Anthony VK6AXB advises that the onset of winter has made repeater site work more challenging, but progress is continuing.

Early in June, the Busselton VK6RBN site received a maintenance check, and upgrade to the link receiver which carries the VK1WIA news and local NewsWest broadcasts.

Photo 1: Don't look down!

Photo 2: Do it once and do it right.

Initial reports are that the new receiver has significantly improved the repeater's broadcast performance, however further signal reports are welcome – broadcasts are carried on VK6RBN 147.350 from 9 am (local time) on Sundays, and repeated at 7 pm.

Joe VK6ZTN advises that the Perth DMR 70 cm repeater VK6RRR has been repaired and is now back on line, after a brief period off air due to a fault. Work is continuing to secure a better site for VK6RRR. Thanks are due to VK6ZTN who, along with John VK6AG has taken the initiative to sponsor this repeater and establish DMR in the Perth area. Also on the digital front, WARG are pleased to welcome

Matt VK6ML, who has volunteered for the vacant Digital Officer role. This position works with WARG's Technical Officer in co-ordinating digital voice, linking and packet/ APRS services. Matt has a personal interest in Yaesu Fusion mode and is presently working to establish a WIRES internet gateway at a site in Brigadoon, north-east area of Perth.

WARG's Committee has been considering how to improve hands-on participation options for newer members, and give more people the skills required to maintain and build repeaters. With site working bees becoming more difficult to arrange, other ways of delivering technical training are needed – a discussion paper has been circulated among WARG members, more to follow on this topic in future.

WARG will have a table at the NCRG Hamfest on 7 August 2016, with "pogo stick" antennas and coaxial cable on sale, and an opportunity for people to join WARG or renew your membership; Hamfest is always a great day, and we look forward to catching up with everyone.

WARG meetings occur monthly at 7:30 pm on the first Monday (or the second, if the first is a public holiday), at the Peter Hughes Scout Communications Centre, corner of Gibbs St and Welshpool Rd, East Cannington. Upcoming meetings are scheduled for 1 August, 5 September and 3 October 2016.

WARG's regular on-air technical and general net continues every Sunday, at 10:30 local time, on VK6RLM, 146.750. More information is on our website *www.warg.org.au* or contact *secretary@warg.org.au*

Repeaters

While on the subject of repeaters, the NCRG has relocated their 2 m and 70 cm repeaters to a new location at Perth International Telecommunications Centre on Gnangara Rd. You know the place, the one with the big dishes! They were fortunate to gain access to a 30 m tower and a small building after many months of negotiations.

Both repeaters have been relocated, though the 70 cm is not on air as I write this but could be by the time you read it! Along with the 10 m beacon, IRLP and some other services, this site will free up the club from having to switch everything off when we contest. (And the coverage is much better). Back to the club news.

Bunbury Radio Club

From the South West we have the latest from the **Bunbury Radio Club.**

At our May meeting, Brian VK6TGQ gave a demonstration of packet radio with a particular focus on APRS. Brian's setup used a handheld in conjunction with the ubiquitous Raspberry Pi computer to provide a relatively inexpensive setup. The demonstration gave valuable insight into APRS for many of us not familiar with this technology. It also showed some of us how powerful a modest computer such as the Raspberry Pi can be. These monthly talks are designed to help bridge the gap between the "knowledge rich" and the "knowledge poor" and if the reaction following informal discussion around the following BBQ is any measure that aim was achieved.

The technical program for the rest of this calendar year is as follows on the table below.
The next monthly meeting of the Bunbury Radio Club will be held on Saturday 9 July 2016 from 2:00 pm. at 21 Halsey Street, Bunbury. This will be the Club's AGM and all members are requested to attend. Any member wishing to stand for election to the Club's Committee should contact our President Richard VK6VRO.

Bunbury Radio Club will be running licence assessments on 23 July 2016. At present we have one Foundation applicant and four club hopefuls sitting for upgrades for their Standard licences. For further information, contact Norman VK6GOM on 0438 878 582.

Any South West based amateur (or anyone interested in radio or electronics) is more than welcome to join and participate in our activities. Because so many of our members come from near and far we are evolving into a semi "virtual" club. Consequently, regular attendance at meetings is not a requisite for membership. The annual fee is only $25.00. Those wishing to join can contact the Club via our Secretary, Nick Evans on 0429201343, or vk6brc@wia.org.au. Further details can be found on our website at http://bunburyradioclub.wordpress.com

Thanks Norm, it's getting busy down your way!

Well that's the end of contributions for this month, perhaps the Publicity Officers of all the other clubs/ groups in WA might like to send me something, i.e., it's been a long, long time since I heard from the Southern Electronics Group to name just one.

So to **NCRG** news

NCRG

We were contacted by Mark Tell of the ACMA to see if we would stage a meeting at the club rooms for all WA amateurs who may be interested in attending. So we set it up for Tuesday 28th June 2016 and 27 amateurs attended.

We put on a sausage sizzle at 6 pm to allow those coming straight from work to have a bite to eat and then got down to business at 7 pm.

August 2016	Murray VK6HL	*Demonstration of software defined radios*
September 2016	Ian VK6MIB	*"All Star Radio for beginners"*
November 2016	Shaun VK6PAL	*How to build a home brew antenna analyser*
December 2016	Richard VK6PZT	*Raspberry Pi and robots*

I was wondering how this might go as the various local email groups had been thrashing out ACMA grievances for a couple of weeks before the event.

Well I'm happy to say it was a very interesting and enlightening evening!

Mark explained his Department's history and current functions and took us through why their activities were necessary and increasing in these days of interference from just about everything to just about everything! This hour long presentation was followed by another interesting hour of questions and answers and a display of some typical confiscated equipment. One thing I must mention in his presentation was his comment something like: "We don't generally have a problem accessing radio amateurs' homes, the biggest problem is getting out again the same day!"

I know Mark is an amateur and a WIA member, so thanks again Mark for the talk.

Now NCRG Hamfest 2016

Hopefully, by the time you receive this, those of you who will require a table will have contacted me if you intend to have one? If not please do so at once!

We thought long and hard about what new additions we could make to the show this year; it isn't easy being on this side of this rather large country of ours when the commercial suppliers are on the other side. But a couple of WA companies are putting a big effort into Hamfest this year with quite large displays and items for sale that are amateur related, we hope you will support them.

We also thought about our raffle and its prizes; what would YOU really like to take home if you won? How about the one radio everyone is talking about at present, the Icom IC-7300?

So the club bit the bullet and bought one to raffle for you. Thanks to RF Solutions and Icom Australia, we ended up with assistance in purchasing this fine radio and being able to offer it as the first prize. We have also received other prizes for the raffle from VK4ICE Communications and Future Systems. As this raffle exceeds the value for our usual Hamfest ticket sales, a permit has been obtained from the Govt. department. There will be other additional prizes on the day and the Homebrew Competition will be held as usual, great entries last year!

One new exhibit this year will be ICRAR, the International Centre for Radio Astronomy Research, based at UWA, the University of Western Australia. I approached them last year but our event clashed with another, but this year they made sure they could attend. They will be providing a static display and their TRT (Tiny Radio Telescope). I think many radio amateurs have more than a passing interest in astronomy and perhaps radio astronomy so this will be your chance to ask those "how do I do it from home" questions; they are keen to offer suggestions!

We had hoped to be able to offer a couple of presentations with the assistance of the WA News service, but time was a bit short so maybe next year.

Food will be excellent as usual, I need say no more.

Doors will open for sellers from 7.30 am and for buyers from 9 am.

Location as usual, Cyril Jackson Centre, Fisher St, Ashfield 6054; train station is Ashfield 200 metres away and only 10 km east of the city centre. Entry is still $5 each for everyone, sellers included, tables are still free.

Due to requirements from the Gaming Commission, the raffle will be held at 1pm, and tickets will be drawn from the barrel.

The preference is for prizes to be collected at the time of the raffle. If you can't be there we will allocate the most expensive remaining prize to your ticket. If you are not there, you will be informed and you can collect your prize from the NCRG club house the following Sunday morning.

The raffle is limited to 1000 tickets, $5 each, no bulk discounts: your chances are looking good.

Club members have already put their hands up to buy over 400 tickets, so if you want to win the prizes you will need to be there on the day. Prize winners will be listed on the NCRG website.

We are open to suggestions for what you want to see at Hamfest, so there will be comments forms available on the day and they will be considered for next years event.

Well that's about it from me this month; say hello at Hamfest, I'm the pain in the .... on the microphone.

73 de VK6RK *vk6rk@wia.org.au*

Can you contribute?

Our **SWL** contributor has retired.

Are you able to put together regular contributions on this subject, or on a topic not already covered in the magazine?

Please read the information on how to contribute (*http://www.wia.org.au/members/armag/contributing/*) and then send an expression of interest outlining your interest to: *armag@wia.org.au*

VK5news Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

WIA AGM on Norfolk Island

AHARS was very well represented on Norfolk Island for the WIA AGM. There were 13 members or XYLs. In fact there were about 30 VK5s who attended as the photo shows. This picture was taken at the "Fish Fry" venue. A Fish Fry is one of the most popular activities on offer and was chosen to be the final night of the actual AGM program.

The island is a lovely semi-tropical paradise and a very historical one as well. The island was discovered by Captain James Cook on his second voyage to observe the transit of Venus. When the British decided to use Australia as a convict settlement, they also decided to make a second convict settlement on Norfolk Island so they could establish their claim to both lands for Britain. One of the ships of the First Fleet brought by Captain Phillips was sent on to Norfolk Island just two weeks after the landing at Botany Bay.

A number of years later, after at least two separate convict colonies, Norfolk Island became the new home for the survivors of the "Mutiny on the Bounty" who had previously made their home on Pitcairn Island. In fact, today, to be descended from one of the Pitcairners is a thing of pride.

It was a very successful AGM, with approximately 100 attendees. That number included about 30 YLs. While the actual AGM was on, the YLs were divided into two groups, one doing a history based tour and the other an arts and crafts based one. As most people had chosen to stay on the Island for at least a week, many of the tours were sampled. A play about the Mutiny on the "Bounty", a Progressive Dinner or an "Evening as a Convict" and a bird-watching tour are just some of the attractive options for visitors to try.

Photo 1: VK5s on Norfolk Island at the Fish Fry.

As a venue for the WIA AGM, Norfolk Island will take some beating. Next year you are invited to come to Adelaide.

Many of the amateurs on Norfolk used the special event station of VK9ANZAC which was set up in one of the rooms at the main venue. Many others used the UHF repeater set up for the occasion as well. Paul VK5PAS and several others made contacts from the two 'mountains' on the actual island but were disappointed not to be able to make a summit on Phillip Island as had been planned. Unfortunately access to the true peak on Phillip Island required the use of rock climbing gear, information not supplied beforehand.

One of the microwave contacts made using a rig brought over by Keith VK5OQ is reported in the ALARA notes, as Shirley VK5YL a member of both ALARA and AHARS made a contact on 3.4 GHz.

A very interesting meeting

The June meeting of AHARS was a very interesting and informative one. The topic was Magnetic Loop Antennas. Steve VK5FA spoke about the technical aspects of this type of antenna, including test results and Paul VK5SFA talked about the actual construction of the antennas. Paul also made it clear that he was enthusiastic about finding a portable test antenna to use on the 160 m band and urged our members to 'have a go' on this and other even longer wavelengths.

The double loop antennas have and extremely good low angle of radiation which is excellent for long distance operation. They also proved, under test, to be particularly good at ignoring local noise, e.g. from all the electronic devices we now have in our homes and even from powerlines!

The antenna is constructed using Heliax cable. This is made of copper but is very flexible, so

it can be bent into a circle or two circles, in this case, without creating any breaks in the conductivity. All connections to the Heliax have been made with copper strip and it is silver soldered. Vacuum capacitors and a 1:1 balun were used in the physical construction.

The loops are 3 m in diameter, (plastic water pipe was found to work well here, having strength without any conductivity) mounted on a single, guyed pole so it is easily rotated.

For portable tests the pole was mounted on a camera tripod. These tests showed that the signal was unchanged out to 700 m. The test patterns show the very low angle of radiation.

More details are available from Paul's website *vk5sfa@wia.com.au* with a link to his magnetic loop.

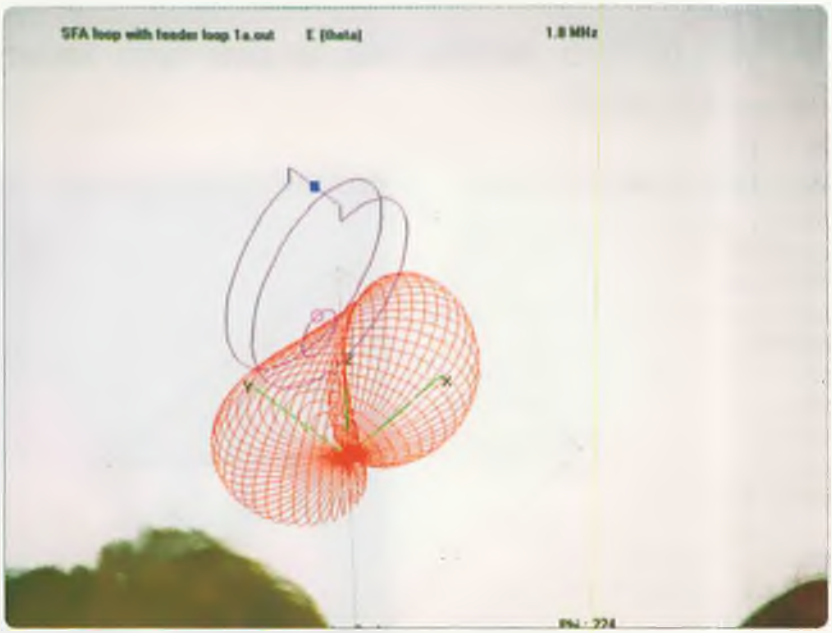

Photo 2: Predicted radiation pattern of the loop antenna.

MF Downunder

David (Doc) VBK5BUG has collated a large group of articles written by people from the Southern Hemisphere about all things concerning antennas and theory for operating on the lower bands. This includes the information given to AHARS members by Paul and Steve and other articles by Leigh VK5KLT and Lloyd VK5BR, both of whom are members of AHARS who have researched and built antennas for 160 m and below.

Doc produced this book for several reasons. He has always been interested in the longer wavelength bands (especially for CW operation) but found that almost all the information was from either the RSGB or ARRL publications. He knew from personal experience that work had been done by amateurs in the Southern hemisphere.

The book is called "MF Downunder" and is available through *d.wd@bigpond.com* The cost is $48 plus postage.

Photo 3: An example of the loop antenna.

Other AHARS activities

The shack is open every Sunday with technical lectures on alternate Sundays. The very good lectures by Graham VK5ZFZ about Arduino microprocessors will be continued in the next few weeks. An assessment weekend will be held in early October 2016 and an auction of deceased estate equipment, some of it in original boxes will be held soon. Please listen to the Sunday morning broadcast or look at the AHARS website for more information.

The mid-year dinner will be on Sunday 17 July 2016 at the Victoria Hotel O'Halloran Hill at 12 noon. Please let Barry VK5BW or Roy VK5NRG know if you wish to attend and have not yet given them your name.

A $10 antenna for 2 metres that anyone can build

Jim Tregellas VK5JST

Introduction

Want a gain antenna with a low radiation angle that you can make in 30 minutes with basic hand tools, which will last years and cost peanuts? Read on....

General

There is nothing new in this article, aside from a very streamlined method of manufacture, which on its own makes this antenna a great club project. The J pole to be constructed is a justifiably famous antenna, and works by driving a half wave vertical element with a quarter wave matching section. Viewed from above, it has an omnidirectional radiation pattern, and if viewed from the side, puts out maximum power along an upward sloping line of about 12-16 degrees relative to ground. This low angle radiation pattern often allows the J pole to outperform much more complex and theoretically better antennas. To avoid stray currents on the coaxial feeder, make two or three turns of around 75 mm diameter in the coaxial feeder close to the antenna.

Construction

A massive advantage is that all parts necessary can be acquired in a single visit to Bunnings. See the parts list for details.

Construction starts by bending the single 3 metre length of 10 mm diameter aluminium tube into its final U shape. Find yourself a piece of solid metal rod 10 mm in diameter. This could be the unthreaded shank of a large bolt, the shank of a 10 mm drill or a piece of steel rod.

Mark out where the aluminium tube is going to be bent with a felt tip pen. The trick here is to bend both vertical sections of the antenna so they are a bit too long, and then cut off the excess after bending. So make your two sets of marks at say 520/530 mm and 582 /592 mm from one end of the tube. Place both the aluminium tube and 10 mm rod into the vice as shown in Photo 2.

Photo 1: The completed J-pole antenna.

Note the "safe jaw" which provides a flat surface against which the tube is squashed. Make sure that the tube and 10 mm rod are at right angles and that the 10 mm rod is centrally placed between each set of marks (which are 10 mm apart). Then tighten the vice to squash the aluminium tube flat. Repeat this at the second set of marks, and then hand bend the tube to its final perfect U shape.

Cut each vertical antenna section to its final length (see the drawing) and remove any burrs with a file. Slip on the two stainless steel hose clamps.

Now mount your antenna on to its wooden base. There are two ways of doing this. If you have access to a bench drill, measure the centre to centre distance between elements (around 60 mm) and drill two 10 mm holes right through the 42 mm width of the wood using this dimension. Retain the antenna by drilling a small pilot hole centrally right through both the wood and the longer vertical element.

Use a plated self-tapping screw to lock everything into position.

If you cannot use this method then from the scrap tube left over, cut off four 21 mm lengths of tube and flatten each of these totally in the vise. After drilling as per the drawings, use these parts to clamp the antenna onto its wooden mount. Using flattened pieces of the same tube from which the antenna is made has the great advantage that everything is the same metallurgically - meaning that

Photo 2: Close up of the technique to bend the tube.

Photo 3: Close up of the antenna feedpoint and mounting method.

little corrosion will occur, even in hostile environments. Under no circumstances should brass fixings be used anywhere to retain the antenna. Corrosion will virtually occur before your disbelieving eyes. If you can get stainless steel retaining screws, use them for long life. Zinc or cadmium plated steel screws are an acceptable but inferior substitute.

Install the two plastic chair leg ends over the cut ends to complete and waterproof the antenna element.

Finally, take your piece of 50 ohm coaxial cable, and strip it back to expose appropriate lengths of sheath and central conductor, ready for connecting to the stainless steel hose clamps.

Next, immerse at least 75 mm of the cable end into marine varnish or clear polyurethane lacquer so that the varnish can "wick" up into the internals of the cable via the woven sheath. Let the cable sit in the varnish for 5 minutes or so, and then remove it and allow it to drain.

Photo 4: Close up of the antenna feedpoint and an alternate mounting method.

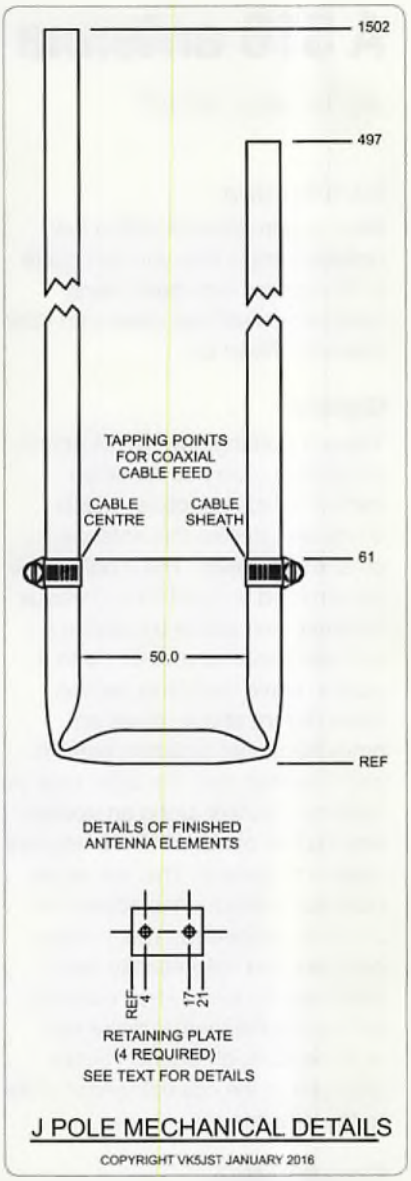

Figure 1: Mechanical details of the antenna.

Wipe down the cable exterior, and while the internals are still wet, finally fit it to the hose clamps and wooden mount. This process waterproofs the cable for many years, avoiding the need for self-amalgamating tape and expensive connectors.

If you want to disconnect your antenna quickly then put your connector on the other end of the cable out of the weather. Note that to assist in waterproofing, the cable is connected to the antenna from the top, so that water drains off the cable rather than into it.

Attach a short length of mast, and then adjust the position of the hose clamps to obtain the lowest SWR on your antenna analyser or SWR meter. Whilst doing this, keep the antenna positioned at least 2 metres away from ground and from anything metallic. With a little care, an SWR of well under 1.2 is easily obtainable. The prototype had an SWR of less than 1.15 from 143 to 150 MHz.

Finally complete your antenna by giving everything several really good coats of marine varnish (or similar waterproof UV resistant finish) and allow to dry.

You will be surprised when you put it on air- these are great antennas.

Jim Tregellas VK5JST

Parts list

3 metre length of 10 x 1 mm aluminium tube Bunnings Metalmate RCR $6.69

1 set of 9.5 mm plastic leg tips Bunnings 25713 $2.04

2 @ 6-16 mm dia. stainless steel hose clamps Bunnings Toledo 3100207 $2.16 total

1 metre length of pine or hardwood – dressed size 42 X 19 mm

8@ 25 mm long 3 mm diameter stainless steel screws (if required).

WIA Contest Champion 2015

Peter Richardson VK2PR

With the 2015 Oceania DX Contest results now officially released, the 2015 WIA Contest Champion has been determined.

Congratulations to Peter Richardson VK2PR for taking this year's trophy with a score of 316 points, only 16 points ahead of equal second place getters Iain Crawford VK5ZD, Timothy Dixon VK5ZT and LL Mew VK5LJ.

The top 10 places were occupied by 10 operators with scores ranging from 316 to 200 points.

Interestingly, only two of the top 10 operators participated in the Ross Hull Memorial VHF/UHF Contest and only three of 10 participated in the Oceania DX Contest while another 9 of 10 participated in the John Moyle Memorial Field Day, 9 of 10 participated in the Remembrance Day Contest and 7 of 10 entered at least one VHF/UHF Field Day.

1st:	Peter Richardson VK2PR	316 points
Equal 2nd:	Iain Crawford VK5ZD, Timothy Dixon VK5ZT, LL Mew VK5LJ	300 points
5th:	Douglas Hunter VK4ADC	280 points
Equal 6th:	WI Jirgens VK1WJ, Andrew Davis VK1DA, GA Hill VK2IO	260 points
9th:	Allan Mason VK2GR	240 points
10th:	Hilary Bridel VK2IUW	200 points

The complete Contest Champion List can be found at the following webpage.

http://www.wia.org.au/members/contests/contestchampion/

Hamads

FOR SALE – VIC

ICOM HF Transceiver model IC-707. In box with mic. Mint condition. $400. *wilmax@vic.chariot.net.au* Max VK3GMM.

Yaesu FT-480R, 2 m all mode transceiver E.C. with manual, $300. Mirage 2 m amplifier B-108 E.C. with remote control, $200.

Phone Brewster Wallace VK3YBW on 03 9527 2661 after 6 pm, if no answer please leave a message.

WANTED – VIC

Relay for 2 m linear amplifier model ELH 230. Battery type 3A5 twin triode.

Icom IC-730 HF transceiver handbook or copy of same and any other information regarding circuit and Service Manual.

Any information on ICE Inoue Communications Equipment Corp. 6 m transceiver model FDAM 3 circa 1968.

Word Processor Citizen model CBM 10 WP, working or not but the LCD screen must be complete and undamaged.

Any one that can repair old model Yaesu and Icom gear.

Phone Brewster Wallace VK3YBW on 03 9527 2661 between 6 and 10 pm, if no answer please leave a message.

WANTED – NSW

Australian Telegraph Keys by author and historical collector. Cash paid for good quality keys, working or not. Steve VK2SPS 0415 559 784

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

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- 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.

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PO Box 2042
BAYSWATER VIC 3153
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Advancing and Protecting Our Interests and Privileges

Every licensee has a stake!
Your voice with the authorities – nationally (ACMA) and globally (ITU)
Collective action over decades achieved all we enjoy today
Fought off proposed huge licence fees in the 1990s
Simplification of licences - 5 reduced to 3
Introduction of the Foundation licence
Removal of Morse code test for HF band operation
New frequency allocations: 80 metre DX window; 136 kHz; 475 kHz
Gained more operating modes and technologies
Unique callsigns and prefixes for special occasions
Ensuring our privileges are aligned internationally

Protecting Our Spectrum

Retained continuing access to the 70 cm band
Acting to have intruders removed from our bands
Opposing interference threats from technologies such as BPL

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Weekly broadcasts – 30 minutes of national news
Also online in text and audio
Website news bulletins - reported "as it happens"

WIA Around the World

The work of the WIA extends beyond Australia's borders.

The Institute is a member of the **International Amateur Radio Union** (IARU), which advocates and represents amateurs' interests to the **International Telecommunications Union** and at the important **World Radio Conferences**. Nations around the world attend these Conferences, held every few years, to determine global radio regulations and frequency allocations. Australian amateur radio bands are allocated from these global decisions.

The WIA is involved in Australia's preparations for the World Radio Conferences and attends with the Australian delegation. Institute volunteers do this work. WIA attendance is funded by the Institute on behalf of all Australian radio amateurs.

Time to renew your membership? Look over the list again.

Renew online:

https://wiamembers.memnet.com.au/

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