Amateur Radio

Volume 85
Numbers 3
March 2017
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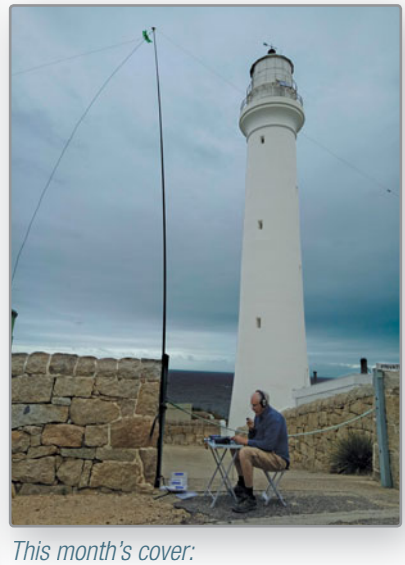

This month's cover:
Our cover photo this month shows Marc Hillman VK3OHM operating portable adjacent to the Point Hicks Lighthouse in East Gippsland. See the brief report in this month's Amateur Radio Victoria notes on page 49. Also read the SOTA and Parks column. Photo by Marc Hillman VK3OHM.

General

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.

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The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Editorial

Peter Freeman VK3PF

Time to play your part in our democracy

Last month I outlined some of the issues that have been under discussion concerning our hobby and our national organisation: our WIA.

Nominations for the upcoming election closed on 31 January and the Returning Officer has announced the names of the 13 candidates whose nominations were received.

Included with this issue of *Amateur Radio* are the candidate statements, the voting form and envelopes. Be careful – do not throw away the cover sheet and the other loose items!

If you do not receive the print copy of the magazine, I understand that the National Office will forward voting papers to you via the mail.

It is important that you follow the directions on the ballot paper. Cross out the names of the candidates you do not vote for, leaving up to seven names not crossed out. Follow the instructions for placing the ballot paper into its proper envelope, and then the instructions for the outer envelope.

Your postal ballot paper must be returned to the National Office (pre addressed on the outer envelope) on or before close of business on **27 March 2017**.

As I noted last month, it is up to you to carefully read the candidate statements and arrive at your assessment of the candidates that you believe are the best to lead our organisation. Please follow the voting instructions carefully: you must not have more than seven candidate names NOT crossed out, otherwise your voting paper will be declared invalid. You must then follow the instructions carefully regarding the envelopes and have the outer envelope with the appropriate contents in the mail to arrive by the deadline. Late returns will not count.

Therefore, I urge you to undertake this task with some urgency, but with due consideration.

My understanding is that it will then be a simple process once returned ballot papers are assessed as valid: each candidate not crossed out will receive one vote from you. The Returning Officer then tallies the number of votes for each candidate and the seven candidates with the highest numbers of vote will be declared elected.

I would expect that the results of the poll will be announced in due course on the WIA website.

Remember that the newly elected (and/or returned) candidates do not take office until after the closure of the Annual General Meeting in May.

It is your privilege and dare I say duty to participate in this election process. No, we are not like our governments at different levels: voting is not compulsory. But if you do not vote, do you have any rights to comment on the outcome? I would suggest: not really! If you do vote, please be willing to accept the outcome of this democratic process. Then get behind the new team and help them to run this organisation.

A neighbourhood of Broken Windows

The February QST commentary by ARRL CEO Tom Gallagher NY2RF makes for interesting reading.

Continued on page 5

WIA comment

Phil Wait VK2ASD

Behind the Scenes at the WIA

At the time of writing this Comment in early February, the accounts for 2016 have been completed by the book-keepers and are about to have their final check by the accountants, prior to being submitted for financial audit.

Thanks to the book-keepers *2-Peas*, the whole process has gone extremely smoothly. They are now working on streamlining the accounts, simplifying the ACMA financial reporting process, and investigating the possibility of integrating MEMNET into MYOB which would save a lot of manual work in the office.

By the time this Comment is published, the accounts should be with the Auditor. The WIA will show a substantial loss this year, but much less than what some commentators have suggested. In fact, the whole accounting process has gone so smoothly that I will be making a strong recommendation to the new Board that the accounts should remain in the hands of professionals, rather than volunteers.

I'm sure most members have a pretty good idea what the WIA does on behalf of Australian radio amateurs - the advocacy work nationally and internationally, working with the ACMA to improve licence conditions and privileges, the training and assessment service, producing *AR* magazine etc. However, there is an awful lot of tedious behind the scenes day-in-day-out work that needs to be done in order to keep the WIA machine operating for its members, and that may not be so well understood.

Many years ago (early 1970s) when I was a trainee technician for OTC, which later morphed into Telstra, we had a number of daily, weekly, monthly and yearly routines - tedious checks and maintenance to keep Australia's overseas telecommunications going. I thought I'd apply this same format to explain what the WIA does, behind the scenes.

Each day the office processes new member applications and membership renewals, distributes licence assessment packs to Assessors and checks and processes them when they are returned completed, makes licence recommendations to the ACMA, issues callsign recommendations, including special-event callsigns, receives notification of silent keys, handles member enquiries - including an enormous number of phone calls, emails and website enquiries, sells books, processes the mail and distributes QSL cards.

On a weekly basis, the office enters financial records (now done by *2-Peas* book-keepers who are in the office for one day per week) and does the banking. Each second week, the office issues membership renewals by email, issues membership reminder notices by letter, pays wages, and pays suppliers.

Every month, group tax payments go the Tax Office, staff superannuation payments are made, the MYOB accounts are reconciled (again, all by *2-Peas*). The Executive Administrator attends an after-hours Board meeting by teleconference, which often goes for several hours.

BAS payments are made quarterly (*2-Peas* again).

In the first half of the year, the previous year's accounts are finalised for presentation to the members at the May AGM (*2-Peas together with the Accountant/Treasurer*). The Directors' report is prepared and the financial accounts audited. The Affiliated Clubs are asked to furnish a report on their membership and the WIA's Club Insurance is negotiated and purchased for the year. Clubs are invoiced for their club insurance payment for non-WIA members. WIA Committees are asked to furnish their reports for the AGM and the information returned is formatted to fit into the members AGM bundle. Nominations for WIA Directors are called for, elections held, and the AGM is organised and held.

In March the WIA submits a major financial and performance report to the ACMA in relation to the work it performs on behalf of the Commonwealth.

The second half of the year is thankfully a bit quieter, the only yearly routines being renewal of the WIA's business and liability insurances, and another major business activity report to the ACMA due in July.

Phew, it's a big list, and I'm certain there are some small things I've forgotten. Most WIA Directors do not get involved in the daily, weekly, or even monthly routines, but the yearly issues do require a great deal of Board involvement. There are also many other issues that crop up on a very regular basis.

Thirteen candidates have nominated for election to the WIA Board this year, which is a very healthy sign for the future of the WIA. Voting forms and a proxy for the AGM are included as an insert with this issue. I hope this Comment has given you a little more of an idea about what the WIA does 'behind the scenes', and some of the less obvious issues Board members need to be across.

Please take time to vote, and please choose thoughtfully.

WIA news

Have your say on the draft Volunteer Charter

Development of a Charter for WIA Volunteers was agreed and announced by the Board in 2016.

Work on the draft continued during the year, based on principles defined by the community-based non-government organisation (NGO) Volunteering Australia.

The Board reviewed the draft Volunteer Charter in October, which was then circulated to WIA Committee volunteers in November for their feedback.

Now revised following feedback from Committee volunteers, the new draft Volunteer Charter is released to the Amateur Radio community at large for comment. Download the file from the link below.

The deadline for response of 28 February 2017. You can send your feedback via the online WIA Consultation form, accessible via this link.

Results from the first round

The November consultation round had responses from volunteers involved across the awards/contests, broadcast, education, historical, publicity, and technical advisory delivery of WIA services. Each respondent gave the draft Volunteer Charter a thumbs up.

The proposed tenure period of two years for volunteer roles to last before re-advertising them for expressions of interest received mixed responses. Some expressed the view that the two-year period would be too short for some roles, while one suggested tenure might be annually tied to the AGM.

The issue of demarcation between directors' roles and those of Committees was raised. The Charter sets out the principle that each Committee has a director assigned who provides a conduit between the Committee and the Board to keep the Board informed of the Committee's operations and to keep volunteers informed of relevant Board actions and requirements. It has always been the case that there is separation between directors and most Committees.

WIA membership status for Committee members was also raised, as some current volunteers are not WIA members, but support the work of the WIA. In future, it is expected that those few non-member volunteers will need to also accept the Charter to continue in their roles.

Next steps

It is expected that the Committees' roles, functions and activities will be discussed by the new WIA Board in the latter half of 2017.

Work continues towards WRC 2019

A major change in approach for the IARU is a Matrix system introduced with specific responsibilities being taken by individuals on the team at the World Radiocommunications Conference. This followed a review of the IARU efforts at the WRC in November 2015 that it could have been better coordinated and more effective.

IARU Region 3 Chairman, Gopal Madovan VU2GMN says in the coming weeks the IARU will participating in CEPT's Conference Preparatory Group and in its Project Team meetings, and other meetings in the lead up to WRC 2019. A few weeks ago, accompanied by fellow IARU Region 3 Director, Shizuo Endo JE1MUI, they were at the Administrative Council meeting then attended the Triennial conference of IARU Region 2 in Viña del Mar in Chile, South America.

Just prior to the conference, the Administrative Council made a major decision on trying to work out the Branding of IARU across the three regions, with discussion ranging from a unified presentation on webpages and to developing a standard set of visiting cards. Also many important decisions were made and these are detailed on the Region 2 website.

Gopal VU2GMN reported that as usual the IARU Region 3 had more than its share of natural disasters and radio amateurs were at the forefront of relief operations providing vital emergency communications support.

Also writing in the latest newsletter he said Region 3 needed to improve on the work of its several committees and was working toward that aim.

The IARU Region 3 Newsletter Issue 41 is available on the WIA website, as are previous IARU R3 newsletters.

The view the reports select IARU under the For Members dropdown menu then select Region 3 Reports.

Band Planning plays an important role

The Wireless Institute of Australia is reviewing the digital segment in its band plan for the 80 metre band and for several other HF bands where the Australian band plan does not correspond to the plans applying in other countries. It is also making other proposals for the narrow 30 metre band, and wants your feedback.

Activity on a band can include various modes. The best way of avoiding clashes is to set aside different band segments for each of these activities. That is what the WIA does. Apart from avoiding interference, band plans which are voluntary agreements, make it easier for us to find other radio amateurs with the same interests.

The WIA Technical Advisory Committee, led by John Martin VK3KM, reports that for many years our 80 metre band plan has

included a digital segment at 3620 - 3640 kHz. The original reason for adopting this segment was the licensing restrictions that applied at the time to Novice operators. These restrictions no longer apply; so the band plan should be updated to bring it into line with accepted operating practices, which include a greater use of digital modes.

John VK3KM sets out a reasoned argument for that change on the WIA website and in the January/February edition on *Amateur Radio* magazine. The proposal is to align our digimode segment with the rest of the world, by moving it to 3570 - 3600 kHz. Please have a read of the article whether you use digital modes, CW or SSB; because it contains a proposed change to the 80 metre band plan. It also includes proposed band plan changes for several other HF bands, to bring their digital mode segments into line with international practice.

Now turning our attention to 30 metres; there has been some discussion of interference problems that can occur on that narrow band. This band is only 50 kHz wide, and most countries have restricted it to CW and narrow band digital modes.

Australia is a little different because the ACMA permits a mode if the spectrum of a particular band allows. Again, John VK3KM discusses the matter, and with his depth of experience, proposes a band planning solution.

The Technical Advisory Committee wants your feedback on band planning on the HF bands, from both WIA members and the Amateur Radio community generally. Your ideas have equal weight whether you are a WIA member or not. Please read the article, and any thoughts or comments you have would be appreciated.

See the details on the WIA website about the Band Planning project. You can provide your feedback via the website.

Editorial

Continued from page 2

It shows that the ARRL is, and has, experienced similar difficulties as those recently challenging our WIA. He states that "ARRL's most daunting task is balancing and managing the diversity of interest in our (AR) community." He commenced the commentary with the words: *"Recall how uninviting are neighbourhoods of houses with broken windows. They repel, not invite, passers-by. The Ham radio 'neighbourhood' is experiencing its share of broken windows, and our own community is breaking the glass."*

Tom concluded his commentary: *"How can we get more people, especially younger people, to join our community? How attractive is a neighbourhood of broken windows? Let's stop squawking, stop breaking windows."*

Tom discusses the broad church of amateur radio in the body of his commentary. We can be a very diverse hobby, with each of us potentially focussed on our small niche. Is it better to complain about everything that is perceived to be "wrong", or would we all and our hobby be better served by getting behind our representative body and helping it work for us all? I strongly believe that constructively working together has the potential to improve the position of the WIA and, in turn, result in better outcomes for the hobby and each of us as individuals. As always, there are very strong and well-heeled commercial interests out there that are always looking for ways to access spectrum which we currently use.

Until next month,
Cheers,
Peter VK3PF

Making your Pixie QRP transceiver kit slightly less appalling

Peter Parker VK3YE

The Pixie 7 MHz CW QRP transceiver kit is a top seller. Available for under $10 via eBay, it makes a fun rainy day project. Unfortunately most end up gathering dust on the shelf because design short-cuts make getting contacts difficult. Shortcomings include the lack of frequency agility, a weak receiver front-end and low transmit power.

Being crystal-bound is a particular problem with QRP. This is because more success is had by replying to CQ calls or 'tail-ending' stations than calling CQ yourself. To answer others you need to be able to transmit when and where they are listening. This implies frequency agility which the standard Pixie does not provide.

This article describes various ways you can make your Pixie frequency agile. Doing this multiplies the number of contacts possible. I'll also show how it can be made into a useful 7 MHz SSB receiver that can even make cross-mode CW/SSB contacts. Total cost of the kit and the three extra parts needed is under twenty dollars, making it the cheapest way of getting on air.

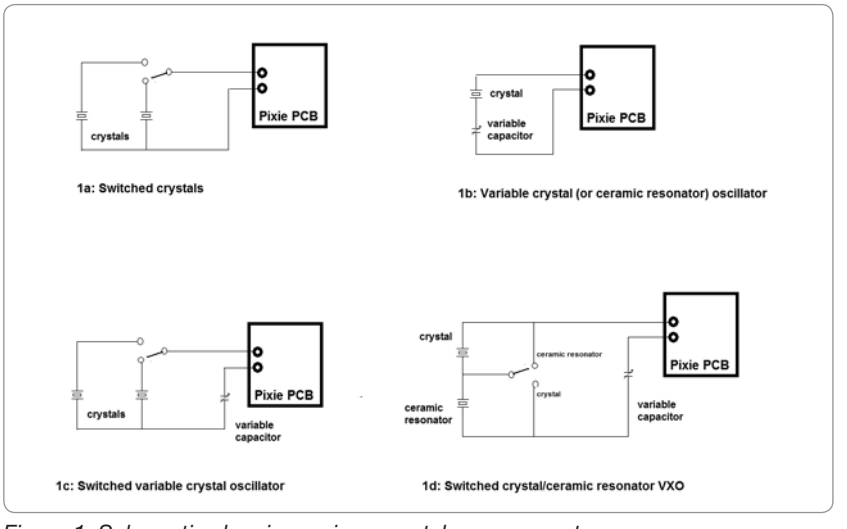


Figure 1: Schematic showing various crystal arrangements.

Adding an extra frequency

An unselective single channel transceiver like the Pixie can be rendered useless if interference appears on or near your crystal's frequency. Others won't hear you and you won't hear others. Calling CQ with QRP only works when you're on the clearest possible frequency and can be plainly heard.

Having several switchable frequencies multiplies your chance of success. If you've already built your Pixie remove the supplied crystal (normally 7.023 MHz) and substitute two PC board pins to allow easier connections.

Then obtain a second crystal. Crystals for frequencies such as 7.015 or 7.030 MHz are cheaply available from suppliers such as Expanded Spectrum Systems (N4ESS). Wire to a single pole double throw toggle switch to allow selection between the two as per the circuit in Figure 1a. Or, if you have more room, add more crystals switched by a rotary switch to give even more frequencies.

Verify operation on all frequencies by listening to your signal on a nearby 7 MHz receiver. You should hear a weak signal when the Pixie is in receive mode and a stronger signal (probably on a slightly different frequency) when the key is pressed.

A variable crystal oscillator

If you've only got one crystal another method of getting frequency agility is to interrupt one of its connections with a series variable capacitor. One with a maximum capacitance of 150 to 400 pF, such as used in AM transistor radios, is suitable. You should get a tuning range of 2 to 3 kHz which can be enough to dodge interference or call nearby stations who wouldn't otherwise be listening on your frequency. Figure 1b shows the circuit.

A series variable capacitor will give coverage above the marked

frequency as its capacitance is reduced. Coverage below the crystal's frequency requires a series inductor which should also increase pulling range. Try RF chokes of a few microhenries, gradually adding them in series while measuring frequency coverage. Stop when the transmitted signal becomes unstable or chirpy.

The Pixie's trimpot adjusts the transmit/receive frequency offset. If you do any VXO modifications reset for an 800 Hz shift in the middle of the tuning range and accept variations at the edges.

There is no reason why you can't combine the frequency switching discussed before and VXO to get two narrow band segments and even more coverage. Figure 1c shows the wiring for this.

A ceramic resonator VXO

Crystals can only easily be pulled a few kilohertz. The choice of frequencies cheaply available is limited, especially for the SSB part of the band.

A solution is to use a 75-cent component called a ceramic resonator. This is less stable than a crystal but can be pulled over a much wider tuning range. For example 7.16 MHz ceramic resonators are available from minikits.com.au and can tune 7.040 to 7.160 MHz.

The circuit is the same as the VXO of Figure 1b but with a 7.16 MHz ceramic resonator substituted for the crystal. If your ceramic resonator has three leads use only the outer two for now. Later on as an experiment earth the centre pin and note the change in tuning range with greater coverage of lower frequencies.

This modification makes the Pixie usable as an SSB receiver. Stations up to about 1000 km distance should be plainly audible if wearing headphones. Sensitivity and selectivity will however be inferior to other receivers. QRP stations may not always be heard and nearby strong AM broadcast stations may swamp desired

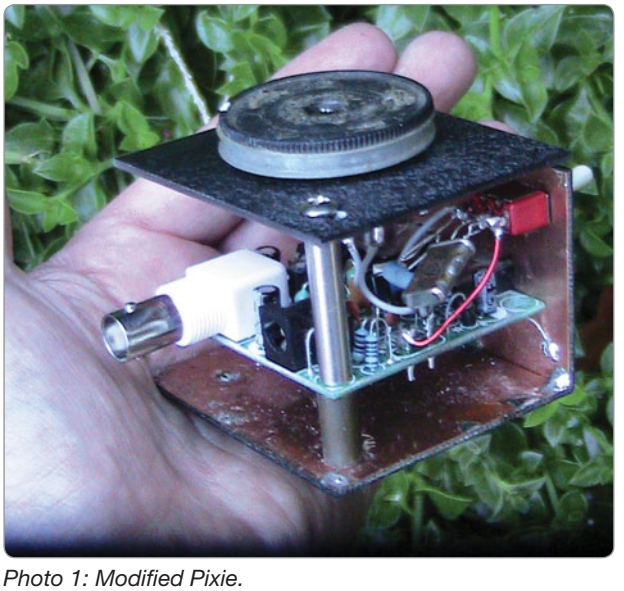


Photo 1: Modified Pixie.

signals. For this reason the Pixie is best for casual listening and suitable for a beginner due to its simplicity and low cost.

Being able to make cross-mode CW/SSB contacts is another benefit of the ceramic resonator modification. Many more VKs operate SSB than CW but most still have some knowledge of Morse. Provided the frequency offset trimpot is correctly set you will be able to call stations on LSB without having to adjust the dial to transmit.

Representing the cheapest and most practical way to get on air, this capability could be useful for working SOTA and other portable stations who will most likely hear you due to their low noise floor.

I've also had success with CW contacts on 7.050 MHz. This is an active frequency for within VK working and there are often stations listening. Even though the ceramic resonator is less stable than a crystal stations contacted there have reported only minor chirp and drift. 1000 km has so far been the furthest distance worked.

None of these contacts would have been possible with the unmodified crystal-locked Pixie. Again you will need to find a compromise position for the offset trimpot because depending on its setting, its transmit frequency may end up below or above the receive frequency. You might care to set it up for a frequency you often use (e.g. 7.050 CW/CW or 7.090 CW/SSB) and make manual adjustments if transceiving on frequencies well away from these.

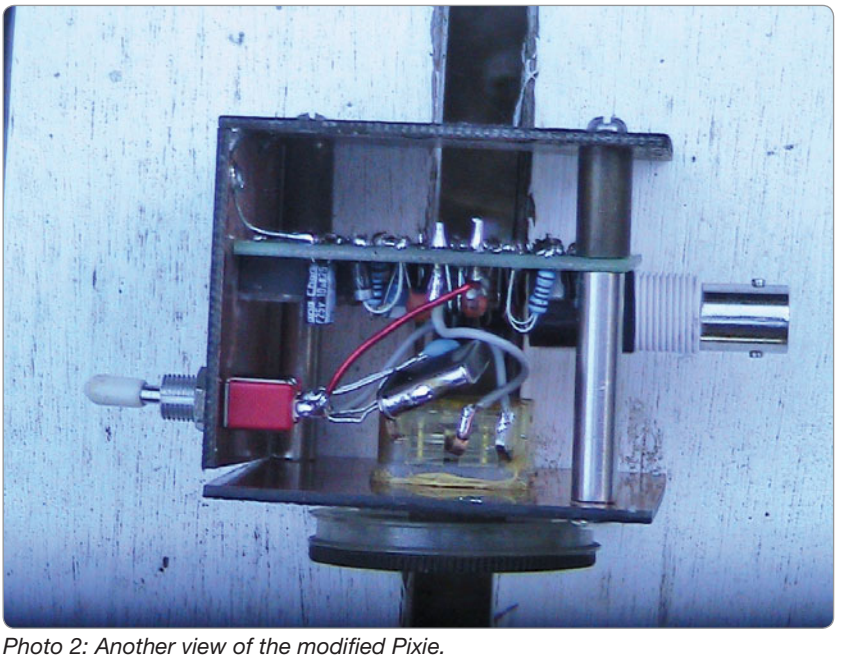


Photo 2: Another view of the modified Pixie.

I recommend a further modification to combine the stability and resettability of crystal control with the agility of a ceramic resonator. The crystal frequency could be used for arranged contacts (or calling if it is clear) while the ceramic resonator range is for listening to and potentially calling others.

Achieve this by fitting the switch as per Figure 1d. You'll notice the wiring is different in that instead of selecting the desired crystal or ceramic resonator the unused one is shorted out. This was found necessary because internal capacitance within the switch was causing the crystal to oscillate even when the ceramic resonator was switched in.

Conclusion

These modifications do not suddenly turn a sow's ear into a silk purse. In particular better receive sensitivity, selectivity and strong signal handling would have been welcome. However they do enable frequency agility and should multiply the number of contacts made. Beginners without HF equipment will also appreciate the receiving capability provided, despite all the compromises. Further information and an on-air demonstration appear on the author's YouTube channel at *youtube.com/vk3ye*

Plan ahead

HARGfest - Lesmurdie	9 April
ANZAC Day (AX prefix)	25 April
International Telecommunications Day (AX prefix)	17 May
Oxley Region ARC Field Day - Port Macquarie	11-13 June
SERG hamfest & Foxhunt Championship - Mount Gambier	11-13 June

A Speech Synthesiser for the Yaesu FT-817

Julie VK3FOWL & Joe VK3YSP

We think "Effie", which is Julie's pet name for her Yaesu FT-817, is a fantastic little rig! It is perfect for SOTA and portable operation in parks. So it can be forgiven for not having a built-in speech synthesiser like some of the bigger rigs. This construction project is for anyone wanting to give this popular little radio a voice of its own. Since everything has to have a name, we called this project "Rachel" after the rather sultry-sounding, synthetic British female voice we used for the text-to-speech conversion.

You can think of Rachel as an accessibility option for the Yaesu FT-817 transceiver: She reads out the radio's frequency, mode and menu settings whenever they are changed via the front-panel controls; she is powered by the radio's accessory port and has her own, small, built-in speaker. We demonstrated Effie and Rachel together recently at the Amateur Radio Victoria, Homebrew Group, as shown in Photo 1.

Photo 1: Effie and Rachel: A perfect match.

The real inspiration for Rachel was to allow a group of our School Amateur Radio Club students to hear the rig's frequency, mode and signal strength without all having to check on its tiny display. They can now more easily fill in their logbooks whenever they hear a new station on the air. Since Rachel can also annunciate all of the radio's menu items and settings, she could be useful for operators with vision-impairment.

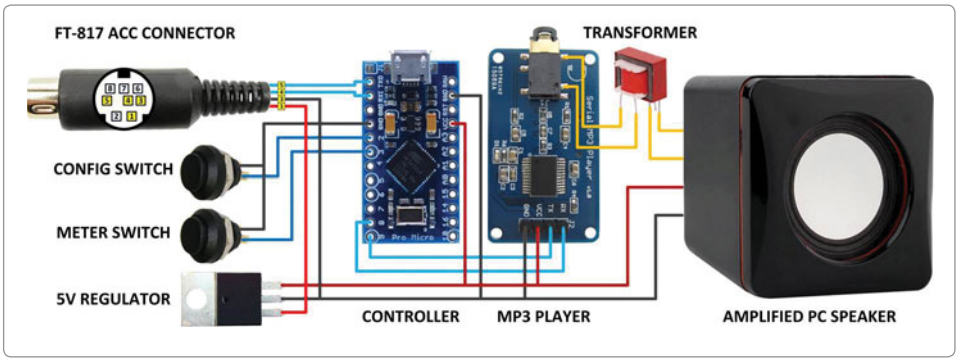


Photo 2: Rachel's Pictorial Schematic Diagram.

Rachel comprises a Pro Micro 5V/16MHz Arduino-compatible microcontroller board ($7), a Calatex Serial MP3 player board ($4), a 3kΩ :3kΩ audio transformer ($5), a 2GB micro SD card ($1), a rig interface cable ($2) and an LM7805 5V regulator IC ($1); all housed in a mini, USB-powered, amplified PC speaker box ($8). These components are all readily available on-line. A pictorial schematic diagram of Rachel is shown in Photo 2.

Construction is straight forward: The controller and MP3 player boards are sandwiched together with double sided tape. All internal wiring is done using solderable, enamelled copper wire. This saved us an awful lot of wire-stripping. The USB powered, amplified PC speakers usually come in pairs, but you only need the one with the amplifier in it. All other USB and audio cables can be removed. While all Rachel's components can fit into the mini speaker case, you might prefer to mount them in a separate enclosure and use an unmodified speaker. An AC powered speaker would certainly have more volume than a small USB powered speaker, but it would not be as portable. The Arduino-compatible microcontroller is programmed through a micro USB jack, connected to a PC running the Arduino IDE software. The FT-817 accessory connector is wired as shown using pins 5 (RXD), 4 (TXD), 3 (GND) and 1 (+13.8V).

Power for the microcontroller, MP3 player and the speaker amplifier comes from the FT-817 accessory connector via the 5-volt regulator IC. Please disconnect Rachel when not in use as the power output from the radio is not switched. The microcontroller board connects between the radio's CAT port and the MP3 player's control port. The microcontroller's hardware serial port is used for communicating with the rig at 34.8k Baud. You need to adjust the FT-817's menu item 14 "CAT RATE" to suit. A software serial port is used for sending "play" commands to the MP3 Player at 9600 Baud. There are two press-buttons connected to the microcontroller: The METER switch is used to report the receiver signal strength (or the transmitter power, SWR, ALC and modulation while transmitting). The CONFIG switch is used to provide a complete readout of the radio's configuration – which takes a good five and a half minutes to read out! Pressing the METER switch will cancel the CONFIG readout. The MP3 player connects to the PC speaker's internal amplifier board via a 1:1 audio transformer. The transformer provides isolation and eliminates the clicks and pops caused by the DC offset of the MP3 player's headphone output.

Rachel uses over 180 pre-recorded MP3 files to speak frequencies, modes and radio settings. The MP3 files were generated by a text-to-speech application. The MP3 Player indexes these files not by their name, but by the exact order they were copied to a 2GB (maximum size) micro SD card. They must be copied to the root directory of the SD card, one at a time in numerical order. Simply copying and pasting the files won't work. You can do this quickly by creating and executing a DOS batch file in the same folder as the mp3 files. The batch file only needs one command: "for %%f in (*.mp3) do copy %%f D:\" where D: is the SD card disk.

Rachel's software constantly monitors the contents of the FT-817's Electrically Erasable Programmable Read Only Memory (EEPROM), without ever writing to it. This is where all the non-volatile radio settings are stored. The information was reverse-engineered by changing each of the radio's settings and then monitoring the EEPROM for any changes. A table of the EEEPOM addresses and bit masks was constructed for the radio using a small "sniffer" program running on the same Arduino-compatible microcontroller. The Rachel software uses an efficient method of accessing the radio's meters, multifunction keys, configuration menu settings and band-registers. It reads out the name of any parameter changed and the new value selected. Our Arduino software for Rachel is free, released under the GNU General Public Licence. For a copy, including detailed construction notes, you can contact us at *info@sarcnet.org*.

Community event communications for the 200 km Murray Paddling Marathon 2016

Grant Willis VK5GR

The Murray River Paddling Marathon (RPM200), run by the Marathon Canoe Club of South Australia (MCC), is an annual event held over the June long weekend. Now in its 29th year, it regularly has over 100 paddlers participating over various distances, ranging from 35 km for beginners up to the full 200 km for the serious marathon paddlers over the three days. Paddlers and communications crew members start before dawn and travel downstream, travelling approximately 60-70 km a day over three days from Berri through to Morgan in South Australia's Riverland.

Amateur Radio and a Canoe Marathon

As you can imagine, an event of this magnitude has many logistics and safety concerns. It simply isn't possible to run it without effective communications. This is made even more difficult by the local terrain, where the River Murray has formed a 30-40 m deep canyon spanning much of the course. This leads to problematic VHF/UHF and cellular coverage along the route. The true value of Amateur Radio comes to the fore in these circumstances where the operator's radio communications experience can make the difference as to whether the message gets through or not!

From a safety concern, any endurance type event can always raise medical issues for the participants. Throw on top of this the cold temperatures and wind (it is the middle of winter after all) plus the even colder water in the river and the threat of hypothermia becomes very real, particularly if a paddler ends up going for an unintended swim. The MCC has long recognised these risks, which led to them seeking the support of various community based radio clubs and organisations over the years to help provide a safety net across their event.

Since 2014, the Amateur Radio Experimenter's Group based in Adelaide, in conjunction with the Riverland Radio Club based out of Berri, has filled that role whilst promoting amateur radio along the way. This story takes a look at the workings of the event and gives an insight into how Amateur Radio provides a service to the community.

What Communications capabilities are provided?

This event operates with a variety of communications requirements, each of which is tackled differently.

- First, there is the paddler tracking network. This is managed through traditional fixed manned checkpoints operating on 2 m and 70 cm, using a variety of fixed and portable repeater systems to reach net control. The checkpoints are spaced along the river, usually 7-12 km apart and their principle task is to spot, log and notify net control as each paddler passes their location.
- Second, there are various mobile event management "assets" that require communications. These include four safety boats, the race director and the two medic crews. Due to their nature, these are not able to be manned by amateur radio operators. So, to address their communications needs, AREG provides a commercial VHF/UHF repeater/simplex network under temporary land mobile licences. This enables event tactical information to be communicated and combined with checkpoint

data back at net control as part of the overall safety net solution.

- The third network uses a set of unmanned Amateur Position Reporting System (APRS) beacons and internet gateways (i-Gates). This network allows net control to monitor the location of the safety boats, and hence maintain an accurate picture of the event's progress downstream. This is important for managing the 4-knot river closure zone that surrounds the event.

These three networks combine to provide a complete tactical safety management and tracking network capable of supporting such a large event.

To deploy, operate and support this network requires a team of 26-28 operators, caterers and logistics people sourced from both radio clubs. The communications team work long hours, in nearly freezing conditions, starting before dawn each day to ensure the safety of every competitor and official participating in the event.

So, why do we do it? Simple really! Where else do we get the excuse to visit what is arguably some of the most spectacular countryside in South Australia and "play amateur radio" in the field whilst providing a major community service? It is one of the major benefits that amateur radio can return to the community!

Photo 1: Paddlers Progressing Downstream (VK5GR).

The Preparation – What was new for AREG in 2016?

One of the major issues faced in previous years was that the medics were not always with their vehicles. This made contacting them problematic via the commercial VHF network. This solve this, three portable cross-band commercial translators were built for the medics and race director vehicles, allowing these crews to operate from handhelds on UHF whilst accessing the main VHF network via their vehicles. A lot of effort went into mating the commercial equipment together into a working system, much of which was undertaken by Ben VK5BB. The feedback from the medical teams to this development was very positive, and made all of the pain getting it to work worthwhile! (AREG must in particular thank WICEN SA for the use of their commercial licences this year which enabled us to operate this network).

Another major construction project revolved around enhancing the APRS network coverage across the Riverland. To do this, a number

Photo 2: Checkpoint Layout for the 2016 event (Google Earth).

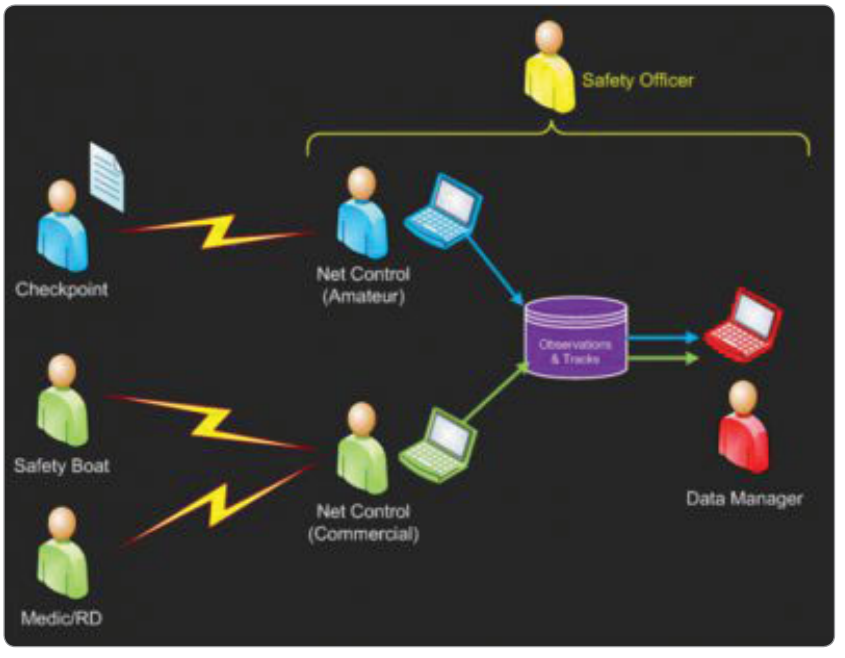


Photo 3: Command & Control System.

of portable APRS Receive only Internet gateways were built, some fed via 3G cellular, to enable more receivers to be deployed to listen for the 5 W APRS boat beacons. The data was then able to be relayed to the APRS network where it could be viewed via sites like aprs.fi.

On top of the equipment, hundreds of hours were again spent by club members preparing the commercial network equipment at multiple working bees, planning the checkpoints, designing the radio network coverage plan, picking and arranging access to repeater sites and developing the rosters in accordance with participant's field equipment capabilities. Peter VK5KX also put in many hours designing and installing the facilities into his camper/bus which was used as the main command centre for the event.

In addition, several exercises were run prior to the event to practice the art of event communications, as well as long distance canoe spotting. This is harder than you might think when you realise the river is over 200 m wide in places and the paddlers invariably hide on the far side in the shadows of the willow and gum trees! This logistics and training work keeps Matt VK5ZM, Grant VK5GR and Andrew VK5XFG very busy before the event.

Command and Control Software

Another major enhancement this year was the further development of the command and control software for the command bus. This was developed and written by Scott VK5TST. It was an enormous help streamlining boat tracking and safety management for the event. Scott not only wrote the software but also provided the LAN infrastructure for the seven machines that were used to run the event.

The Calm before the Storm - Friday night

Most of the AREG crew from Adelaide travelled to the Riverland on the Friday afternoon before the long weekend. Upon arrival, the first task was to install the radios in each of the safety boats. The boats, provided by the Victor Harbor Sea Rescue Squadron, were met at Waikerie by the AREG install team.

Photo 4 - CARP Software - Command & Control Network.

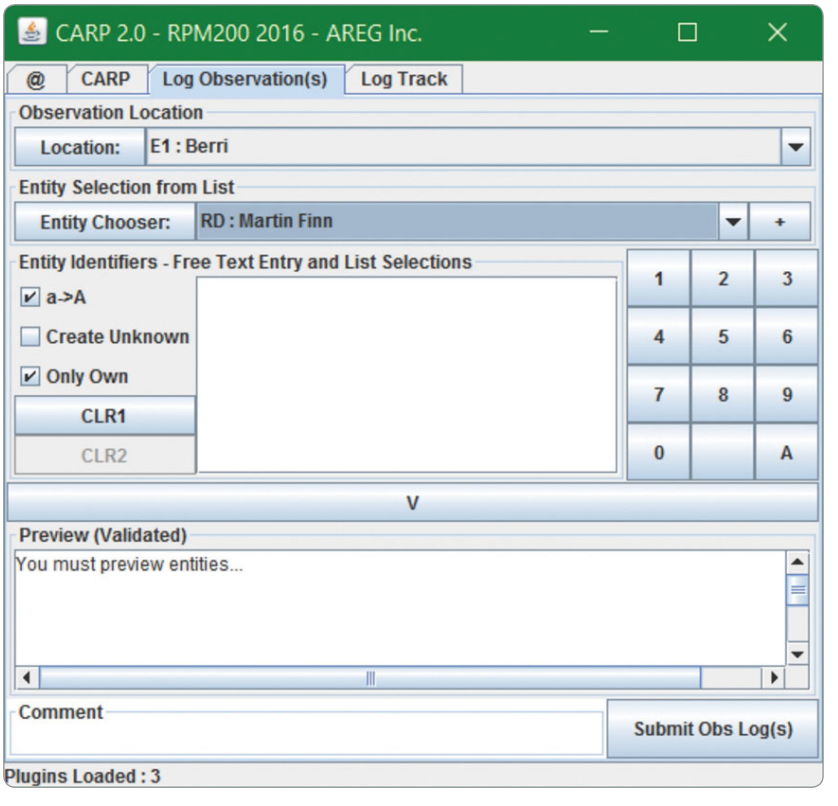


Photo 5: Andrew VK5XFG setting up boats (Photo by VK5TST).

After roughly an hour's work, everything was complete and the briefing to the boat operators had been given. We were set for the start of the weekend!

Curtain Up – Day 1 (Saturday) – Berri to Moorook

On the first day, the event kicked off without a hitch, starting on time not long after sunrise from Berri. Matt VK5ZM met the start crew and manned the first checkpoint. After a minor issue with a lost support boat, everything was set and the starter's gun was fired!

The next checkpoint was at Lock 4 a few kilometres downstream manned by Chris VK5CP, Lena VK5FUNN and Matt VK5ZM. Communications were established with the net control station run by Grant VK5GR who was located on a hill overlooking the lock.

It was while one of the support boats was making its way upstream from Loxton to Lock 4 that the first issue of the event struck. He had difficulties navigating the sand bars in this stretch of the river caused by the very low river flows. Fortunately, the support boat made it just in time.

Finally, after the participants made it through the lock, the event proceeded past Riley Island manned by Mark VK5QI and Gary VK5FGRY before heading on to Loxton, where the M100 starters joined the event.

Back in command, Peter VK5KX and the crew had by now arrived in Moorook and were busily setting up the main command bus. The goal each day is to get the main command centre operational before the start of the 100 km race each day. The work that Peter has undertaken in the design of this facility is such that it goes together very quickly, and it makes the lives of the net controllers so much easier having such creature comforts available inside a field command post.

As the event progressed downstream, it was time for the 100 km marathon start to open. Located at Loxton, this checkpoint was ably staffed by Ivan VK5HS, Peter VK5FLEX, Rob VK5HRS and Kim VK5FJ, a mixed crew from both the Riverland Amateur Radio Club and the AREG. It was here that some early hiccups started to appear with the commercial VHF network. Two of the boats were suffering problems with their radios. One radio had failed, while the other was found to be suffering from mixed up antennas (between the commercial and APRS transmitters). Ivan VK5HS came to the rescue, jumping into each boat to make running repairs so that everything could continue smoothly.

After Loxton, the next checkpoint was Pyap manned by Rob VK5TRM and Louis VK5FLY, (which had been relocated since

Photo 6: VK5ARG-2 APRS Portable i-Gate (Photo byVK5AKH).

Photo 7: AREG Command Day 1 – Moorook.

the previous year). Then came a new checkpoint for 2016, located in Loveday 4WD Park operated by Dennis VK5FDEN and Paul VK5JG. This replaced the floating checkpoint previously operated by a safety boat near the community of Gerard (in an area that is closed for river access from the shore).

The AREG and the MCC organizers were most grateful to the owners of the 4WD Park who granted access to the waterfront inside their property so that we could guarantee safe passage of all of the paddling participants. In addition to the checkpoint, a portable APRS i-Gate was established to assist with collecting the APRS data from the course boats as they travelled down the river. Thanks to everyone involved in setting up this system!

By the time the paddlers reach Loveday they are starting to get tired and from here down, numerous incidents occurred. This kept the command bus crew and Andrew VK5AKH, Andrew VK5XFG, Ron VK5MRE, Rob VK5TS and Sandy (Rob's partner) at the next checkpoint (New Residence) very busy. Fortunately each of the incidents was minor and everyone made it through.

All told, Day 1 was a roaring success, with the exception of some minor issues with the commercial network. We hoped that would be the last of the gremlins, but that wasn't to be the case….

Saturday Evening – Dinner at Kingston on Murray Caravan Park

After a hard day's work, everyone returned to the Kingston on Murray Caravan Park. Here they were treated to the AREG catering service when Sharon VK5FSAW and Irene Hall rolled out a delicious baked potato and shredded roast lamb dinner! Desert was an apple crumble with all the trimmings.

The Saturday evening meal is not the only work for the AREG catering crew, as the club organises lunch boxes for all of the radio volunteers each day as well (as there are no shops near any of the checkpoints and with the very early starts, little time for the operators to prepare their own meals). The AREG lunch service is widely hailed among the volunteers and the group is indebted to Sharon again for all the work she puts in to the catering planning and delivery.

Day 2 – Sunday – Moorook to Waikerie

Sunday morning saw everyone up bright and early. Gary VK5FGRY and Matt VK5ZM drew the short straw and attended the first checkpoint. Matt VK5ZM took great delight in replacing the first of the TAIT commercial radios in the boats with a loan radio from Ivan VK5HS. That was at least one problem solved for the remainder of the weekend!

Meanwhile, Mark VK5QI and Andy VK5AKH manned a combined net control and checkpoint 9 station at Kingston on Murray. Setting up before dawn, they sat by the side of the river and watched the sun rise, whilst braving 4 degree Celsius temperatures.

Lock 3 was the next checkpoint which was manned by Matt VK5ZM (after a hasty drive from the start), Andrew VK5XFG, Grant VK5GR and Sharon VK5FSAW. Unlike last year, when the lock gates wouldn't open,

Photo 8: Saturday Dinner at the caravan park.

everything ran smoothly and all of the paddlers were on their way without incident.

Chris VK5CP with Lena VK5FUNN manned the next checkpoint at Wigley Flat and solved the coverage/access issues there this year with a 2 m / 70 cm translator installed on a short 4 m mast. Co-incidentally, this also happened to be the VK Shires Contest day. For some reason, there were occasional communications issues to and from Wigley Flat, despite the translator, prior to the canoes arriving. We suspect some 40 m action was distracting the checkpoint operators during the lead up to the first canoes appearing (grin). At least the contesting spirit could partially be kept alive by members of AREG whilst running the community comms event at the same time.

Photo 9: VK5QI spotting canoes at Kingston on Murray.

The next checkpoint of the day was the main 100 km race start at Devlin's Pound. This year it was manned by Louis VK5FLY, Mark VK5QI, Gary VK5FGRY, Rob VK5HRS and Kim VK5FJ. One of the logistics changes this year was the assignment of additional people to these major checkpoints. This enabled us to have two people tracking paddlers arriving into the checkpoint, two tracking the departures and one following the race director around and handling paddler incidents. This arrangement proved very helpful in maintaining organised control at these busy locations.

While the checkpoint operators were hard at work, the second command team

Photo 10: Paddlers waiting inside Lock 3 for the gates to open.

Photo 11: Mark VK5QI operating the VHF Commercial Command Station.

had swung into action with Peter VK5KX relocating the bus to a high location near Holder, just outside Waikerie. During the day, the command bus was visited by the race director and his wife on their way through. Both were shown the "smooth operating" and "technology" being the scenes used to keep track of the event. They left very impressed at the sorts of capabilities Amateur Radio had brought to their event.

Not so smooth sailing

It seemed that Murphy was out for some fun on Day 2 as well. More gremlins appeared within the VHF commercial network with communications difficulties being experienced between Overland Corner and Devlin's Pound. Suspected equipment faults and some unexpected coverage issues gave the Holder and Kingston command stations some headaches trying to hand over control between them. Backup communications via VHF Marine radios that one club member had licenses and equipment for saved the day.

It also became apparent that the GPS receiver on one of the rescue boats couldn't see enough of the sky, so keeping a location track on him meant relying on location reports being passed over voice. Sigh…. more work for next year!

Day 2 Draws to a Close

As the day wore on, the Lowbank checkpoint finally opened for the 35 km race start. This is the mini marathon starting line for Day 2, which was manned by the Riverland Amateur Radio Club team. This is always a challenging checkpoint due to the width of the river at this location. That didn't bother the RRC team who did an admirable job spotting, logging, tracking and reporting everything they saw. This year, no paddlers were missed! Well done team!

Day 2 finish was at Waikerie. Paul VK5JG, Dennis VK5FDEN and Irene did a great job working with the MCC time keepers (Ray VK5RR with his Marathon Canoe Club hat on) to log everyone off the river at the end of the day.

Afterwards, everyone headed back upstream and off to the Cobdogla Club for the event dinner. This capped of another successful day!

Day 3 – Monday – Waikerie to Morgan

Day 3 started off very cold and clear. Frost had descended on the land and the trees had been turned white in our headlights as the first team members left home at 4 am. The temperature dropped to minus 3.8 degree Celsius just as dawn broke, and highlighted one of the key risks that everyone in the event management team works to mitigate, hypothermia. This is one of the reasons why the communications capability and the ability to track paddlers and send help is so important to this event.

Andrew VK5AKH and Grant VK5GR were the first to head out, heading for Sunlands to finish setting up the portable Commercial VHF and APRS repeaters. This was a new site for the event and far exceeded our expectations. We are indebted to the land owner in the area who was happy to host our repeater for the day.

Photo 12: Sunday Morning Weather.

Photo 13: Andrew VK5AKH at the Day 3 Portable Repeater site.

Louis VK5FLY drew the short straw to man the start line for Day 3 in Waikerie. Just as the paddlers marshalled at 5.30 am the temperature hit the coldest it had been all weekend. Fortunately, all paddlers got away safely. Scott VK5TST then logged them through the Sunlands pump checkpoint, whilst on top of the cliffs Grant VK5GR and Andrew VK5AKH manned the mobile net control station.

Next came Lock 2. Matt VK5ZM again led the lock control team, showing Kim VK5FJ, Rob VK5TS and his partner Sandy the ropes of lock procedure. After a trouble free passage, the 200 km marathon paddlers headed for Hogwash Bend.

While Lock 2 was operating, Peter VK5KX again moved the bus (having camped overnight at Hogwash Bend), this time to a hill overlooking Cadell Ferry. As life was breathed into the bus radios for one last time, handover was completed from the VK5GR mobile command station in time for the start of the final 100 km leg of the event.

The Day 3 100 km start this year was from a new location at Caudo Winery. Louis VK5FLY, Dennis VK5FDEN, Irene and Paul VK5JG manned this location and benefited from the hot croissants, tea and coffee put on by the winery. This most civilized start line will become hotly contested by checkpoint operators in future years!

The gremlins again come out to play!

Last year, the Day 3 100 km start line struck problems with the medic radio and it seems lightning can strike twice, as it happened again this year. This time the medic radio failed when the fuse blew on the charging circuit allowing the battery to be completely discharged (the wrong fuse having been installed by mistake previously). VK5AKH and VK5GR stopped past the checkpoint on their way to the command bus and made arrangements to swap the medics radio over to the spare translator. Everyone was left happy and communications were again restored.

However, the gremlins didn't stop there. Another one of the safety boats also began experiencing intermittent problems with their radio. Up at net control, all hands scrambled to put together a replacement for the radio, ready to meet the safety boat at the next possible checkpoint. Just as one of the team were about to cross the Cadell ferry the faulty radio started working again. Matt VK5ZM (the communications officer) was heard telling the boat operators that if it failed one more time they could "use it as a boat anchor". Everyone chuckled, including the boat operators; however it does mean we have a lot of work to do for 2017. The decision was made there and then to retire the ageing TAIT radios and update them.

Command Busy on Day 3

Incidents on Day 3 poured into net control thick and fast with reports of other water craft failing to heed the 4-knot speed limit in the closed segment of the river. (The river closures were a new development for 2016, intended to

Photo 14: Checkpoint Crew at Caudo Winery.

support paddler safety and reduce the number of paddlers going for a swim). The problem is that even a modest wake from power boats can be very treacherous for the paddlers, particularly if they are inexperienced or if they are exhausted from the previous two days of effort.

The behaviour of a small number of power boats did cause a few paddlers to capsize and be tipped into the river. These unfortunate paddlers had to then be taken ashore, warmed up and checked over by the race medic before being allowed to continue on.

Finally the paddlers made it past Molo Flat and the Cadell Landing checkpoints. All paddlers entering the river for the last leg of the Mini-Marathon got away cleanly. The race then went on to the finish line in Morgan, bringing to a close another very successful event, both for the Marathon Canoe Club organizers and for the amateur radio network operators from AREG and RRC.

Thanks Team!

The AREG organizing committee would like to again say a massive thank you to the entire AREG and RRC team who combined to make our contribution to the event a success. It was great to see some new faces on the team this year and the committee would very much encourage members who haven't come along previously to consider doing so in 2017. Thanks also to everyone who contributed in the lead up to the event during the working bees and countless nights wrangling the rosters and attending meetings.

It is a great weekend, in some beautiful countryside along the banks of the mighty Murray River. What's more, it is a great way to combine Amateur Radio and community service, something which always strengthens friendships with and further justifies why the Amateur Radio service should continue to be supported by the authorities.

Looking forward to 2017! See you there…..

Acknowledgements

Photos provided by VK5FLY, VK5FGRY, VK5AKH, VK5HRS, VK5TST, VK5GR.

Notice of Annual General Meeting

Business

1. To receive and consider the Annual Financial Statements, Directors Report and Independent Auditor's Report for the year ended 31 December 2016.

2. To announce the results of the election of Directors.

3. To transact any other business that may be brought before the meeting in accordance with the Institute's Constitution.

Notice is hereby given that the Annual General Meeting of The Wireless Institute of Australia will be held at the Adelaide Hills Convention Centre, 145A Mount Barker Road, Hahndorf, South Australia, on Saturday 20th May 2017 at 9.00 am.

By Order of the Board

Jim Linton

Secretary

1 March 2017

Note:

A Member is entitled to appoint one proxy only who must be another Member or a representative of another Member, and that proxy is entitled to vote on a show of hands or on a poll. The Instrument of Proxy accompanies this notification or is downloadable from the WIA website.

While non-members of The Wireless Institute of Australia are welcome to attend the Annual General Meeting and the Open Forum, only members are entitled to vote, and will be identified by a coloured card. Members should register and receive a coloured card at the registration table which will be open outside the meeting room from 8 am. Section 250S of the Corporations Act provides that the Chair of an AGM must allow a reasonable opportunity for the members as a whole at the meeting to ask questions about or make comments on the management of the company.

Open Forum:

Immediately following the formal Annual General Meeting an Open Forum will be conducted. An additional detailed report will be submitted on behalf of the Board, and the Institute's coordinators and those responsible for particular aspects of the Institute's activities will be asked to submit a written report which will be available for those attending the forum. Any major issues affecting each area of responsibility will be identified and the author of each report who is present will be given the opportunity to briefly comment.

Members are encouraged to discuss any matter arising from any of the reports, and to raise any other matter affecting Amateur Radio or the Institute. This format will avoid any restriction arising from the requirement to give notice of business to be formally raised at the AGM.

piHPSDR Display and Control Surface Review

Justin Giles-Clark VK7TW

Background

The original unit design was by John Melton GOORX/N6LYT. John has presented papers to the TAPR DCC on an Arduino CAT controller and then started developing the idea using the RaspberryPi single board Linux based computer. With the advent of the more powerful RaspberryPi 3 and a 7 inch touch screen, he was able to realise a viable control surface for the HPSDR. He gave a presentation at the 2016 Friedrichshafen SDR Academy on his development.

https://www.youtube.com/watch?v=U7QfP28YjCw

The author has homebrewed two of these control surfaces and purchased one from Apache-Labs - serial number 006. The open source philosophy that attracted the author originally to the HPSDR project back in 2010 continues with the piHPSDR control surface and John continues to improve and develop the product using the GITHUB repository hosting service/website.

https://github.com/g0orx/pihpsdr

Abhi Prakash (Apache-Labs) became interested in the project and developed it into a professional control surface product which is the subject of this review.

https://apache-labs.com/al-products/1043/PiHPSDR-Controller.html

Initial Impressions

The unit arrived well packed from Apache-Labs (India) and comes with the DC power cable. The latest manual was downloaded from John Melton's GITHUB repository. As with all Apache-Labs equipment, it is a professionally manufactured and well-presented product. The unit uses a 7 inch RaspberryPi Touch Screen and RaspberryPi 3 with the USB, Ethernet and Power Connector visible on the left side of the unit. There is a stand on the back of the unit to present the display at a comfortable viewing angle. The unit runs happily on 13.8 V DC and draws about 2.5 amps.

Photo 1: The piHPSDR Controller.

The front panel has one large green power button followed by eight momentary push button switches. The six middle switches correspond to the touch buttons along the bottom of the screen and the first button being the Tune button and the last being the Function button. The function button changes the function of the three small rotary knobs. The large knob is the main tuning knob. The functions and switch mapping is programmable if you are brave and want to dive into code and change them.

The look and feel of the controls is logical and the functions not available through the push buttons are available via the touch screen "menu" button. More is being added to the menu and functionality all the time. When I first received the unit there was no 2200 or 630 m band and once I updated the software (to V1.0.7) these bands and other functions appeared. It does pay to subscribe to John's piHPSDR GitHub feed and receive the regular updates.

Design

The case is steel and it has good weight to it. The knobs controls are 360 degree optical encoders, the tuning knob is a high resolution encoder and the weight of the larger knob makes tuning relatively easy – more about that later.

As shipped, the piHPSDR is a stand-alone control surface only and does not come with audio input or outputs. The easy remedy is outlined in the manual and consists of either plugging into the RaspberryPi TRRS connector (which involves opening the case) for output and a USB audio input or just using an inexpensive USB audio dongle for both audio input and output. The other option, which the author uses, is a USB headset plugged into one of the RaspberryPi's USB ports. This removes the audio artifacts that can be a problem with digital modes like FreeDV and DMR (which comes compiled with V1.0.7 of piHPSDR).

Specifications/Functionality

Being primarily a control surface there are only a few specifications to share however the current functionality that is available is also outlined. Please note this is constantly being improved and amended therefore, regular review of John's GITHUB repository is recommended:

Specifications

- Supply voltage and current is nominally 13.8 VDC @ 2.5 Amps max and it will run happily on 12 VDC at around 2.2 A.
- Power connector is a standard plug pack – 2.5 mm ID x 5 mm OD x 10 mm long with a metre of wire and is not fused.
- Finish is matte black powder coated steel casing with black aluminium knobs.
- RaspberryPi 3 Ethernet is limited to 100 BaseT although John has incorporated support for the Odroid single board with 1000 BaseT capability.
- RaspberryPi 3 presents four USB 2.0 ports.
- Weight is 1.9 kg.

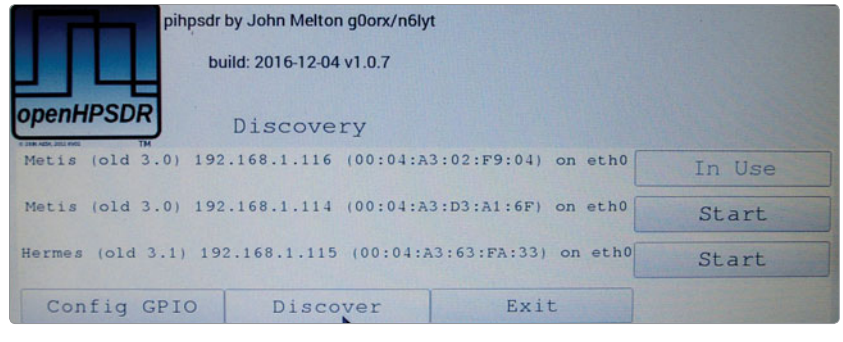
Functionality (Application Version: 1.0.7)

- Frequencies available are 2200 m, 630 m, 160 m, 80 m, 60 m, 40 m, 30 m, 20 m, 18 m, 15 m, 12 m, 10 m, 6 m, Gen and WWV frequencies.
- Modes available are LSB, USB, DSB, CWL, CWU, FMN, AM, DIGU, DIGL, SPEC, SAM, DRM, FREEDV and PSK.
- Filter bandwidth for SSB, Digi, Spec, FreeDV & PSK is 5, 4, 3.8, 3.3, 2.9, 2.7, 2.4, 2.1, 1.8, and 1.0 kHz. DSB, AM, SAM & DRM range increases from 16 to 2.4 kHz. CW range decreases from 1 kHz to 25 Hz. FM deviation from 2.5 to 5 kHz.
- The following Noise Filters are available - NR, NR2, ANF and SNB and are configurable for pre or post AGC, gain method (Linear, Log or Gamma). Noise power estimation can either be Optimal Smoothing Minimum Statistics (OSMS) or Minimum Mean Square Error (MMSE) and there is a setting to eliminate the NR2 artefacts which is effective.
- AGC Speed is settable to Fast, Medium, Slow, Long and off and the AGC level is settable via the touch screen or knob function.
- The MOX touch screen function and TUN buttons are linked and key the transmitter at the TUN drive level.
- It can be configured for up to eight transverters with ability to specify name, min, max and LO frequency and ability to disable the PA if required when not transmitting on the transverter frequency.

Operation

Once unpacked you connect the Ethernet cable directly to HPSDR/ANAN Ethernet port (there is no cross-over cable required), connect the power cable (I installed fuse holders into mine) to a suitable power source and connect the USB audio dongle or USB headset and

Photo 2: The controller showing the Discovery screen.



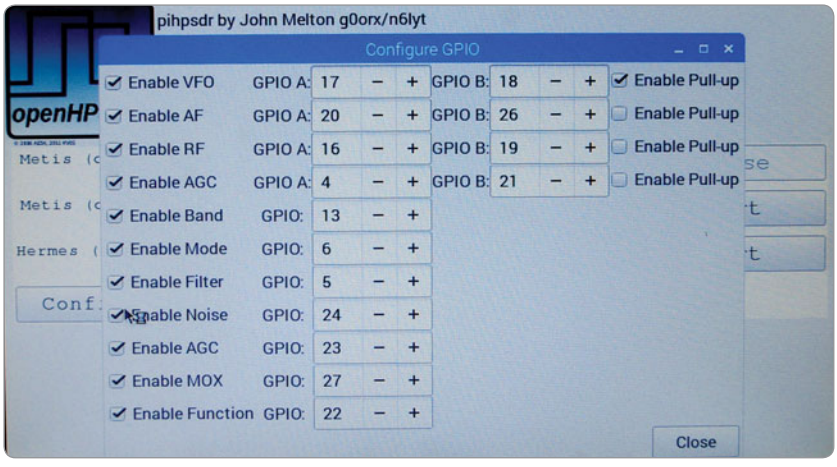


Photo 3: The GPIO configuration screen.

you are ready for switch on.

The RaspberryPi will go through its normal boot up sequence and out-of-the-box it is setup to boot into the piHPSDR application. The first screen you see is the discovery screen.

This screen shows you the HPSDR/ANAN units on the same subnet/network or if you are directly connected then it will show that unit. Sometimes the unit does not pick-up the unit the first time and this is remedied by a press of the Discovery button. The other option available at this screen is the Configure GPIO pins and for the homebrewer this is where you can configure which GPIO pins are used for the buttons and optical encoders. This feature came in handy to change the direction of the main tuning knob which was originally configured in reverse. A simple exchange of the GPIO pins and the tuning on the screen followed the tuning knob direction.

Real estate on the 7 inch RaspberryPi touch screen is at a premium and John has packed a lot into the space available. Most of the display configuration is available through the menu display to specify panadapter, waterfall and tool bar display along with thresholds, detector and averaging settings.

There are a range of Noise Reduction 2 filter settings available in the menu / DSP selection and these are interesting to experiment with. For the CW enthusiast there are the speed, break in delay, straight, iambic modes and side tone level, frequency and weight.

If you have an Apollo or Alexiares band pass filter/PA connected then it makes available the PA level setting for each band and open collector outputs matrix for triggering other equipment. The other settings currently available through the menu function include FreeDV, Transverter setup, equaliser, FM pre-emphasis, frequency step and meter functionality.

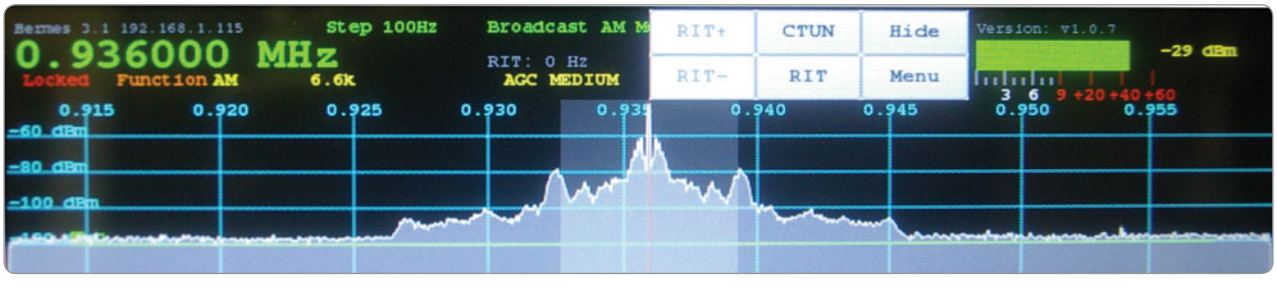
Operation is through a combination of touch screen functions, buttons and tuning knobs. The three smaller rotary encoders are dual function and pre-configured as AF level/Mic level, Drive level/Tune level and Attenuation level/AGC level. The second function being accessed through pressing the function button.

Tuning is done through the large aluminium tuning knob with the rate set by the step level accessed via the menu function. Tuning is supplemented by swiping the touch screen up and down the band and then fine tuning with the tuning knob. Tuning can be locked by touching the screen where the frequency is displayed or the button function on the E1 knob and a small "Locked" word appears.

There is a CTUN function that enables you to touch anywhere in the panadapter or waterfall on the current passband and the tuning along with filter width is moved to that frequency. The Bstack or Band Stack button/function allows you to quickly bring up a small selection of frequencies and modes to quickly jump to as well. There is an RIT function that enables you to move the frequency up and down for fine adjustment although this is a little clunky as it involves the small touch screen buttons; a stylus could help here.

One operational frustration for me is frequency selection outside of the amateur bands. It is tedious to tune outside amateur bands and on the higher amateur frequencies as you cannot just enter a frequency.

Photo 4: The Main control screen.



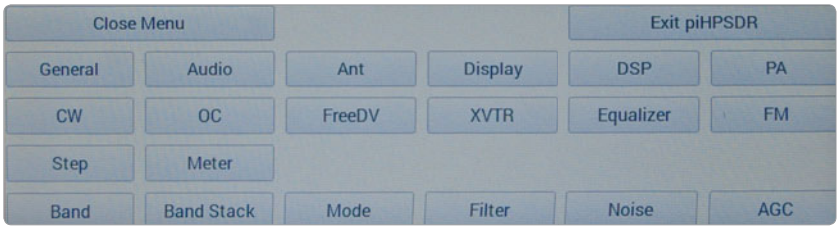


Photo 5: The Menu screen.

I have become used to being able to enter a frequency via a keyboard – SharpSDR, PowerSDR, etc. I run a Bluetooth keyboard with the piHPSDR to get to the other RaspberryPi functions however I acknowledge not all operators will need this level of access.

In Summary

This unit rejuvenates the HPSDR project making it standalone. It also promotes the HPSDR/ANAN into being a generation four SDR (see 2016 Friedrichshafen SDR Academy talk by Dr. Howard White KY6LA). With the piHPSDR you no longer need to lug a notebook, you can operate the radio standalone with the control surface.

If you already or are considering going portable with a HPSDR/ANAN then you no longer have to accommodate the mains supply for your notebook as the piHPSDR runs from 12/13.8 VDC along with the HPSDR/ANAN.

Remote control outside of a WiFi or 10/100 BaseT Ethernet network is currently not possible; however the new communications protocol between the Hermes and ANAN SDRs and the piHPSDR makes true remote control tantalizingly close. The remote head control surface is the platform to facilitate this outcome.

Full credit must go to Abhi and the team at Apache-Labs, who have taken John's original concept and transformed it into a professional production unit that will stand the rigors of a shack or portable environment.

The unit is currently available directly from Apache-labs in India for US$599.

https://apache-labs.com/

Or an alternative is that you can homebrew the unit – it's all open source – gotta love that!

73, Justin VK7TW

AMSAT-VK

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Group site:
group.amsat-vk.org

About AMSAT-VK

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

AMSAT-VK monthly net
Australian National Satellite net

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

In New South Wales
VK2RBM Blue Mountains repeater on 147.050 MHz

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

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

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

In the Northern Territory
VK8MA Katherine 146.700 MHz FM

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

Become involved

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

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

WIA Contest Website

To keep up to date with all of the major Australian contests, including rules and results, at the WIA Contest Website at:
www.wia.org.au/members/contests/about

DX Talk

Luke Steele VK3HJ

For most of January, solar activity was very low, but it picked up towards the end of the month, with a few sunspots appearing. Propagation followed suit, with even the 20 m band showing little action, until the beginning of February. The most reliable band still seems to be 40 m, with the lower bands patchy. Top Band is now starting to show some propagation to Europe around sunrise.

The first sunspot of Cycle 25 appeared in the third week of January. This was identified as a new cycle spot as it had the opposite magnetic polarity to the current cycle spots. The appearance of a Cycle 25 sunspot does not mean we have started the new cycle; there are still a few years to go until we reach the minimum between cycles.

For those interested in Space Weather, see Tamitha Skov's YouTube channel for Space Weather news. *https://www.youtube.com/user/SpWxfx*

DX worked or heard during January included S01WS Western Sahara, HV0A Vatican City, UA4WHX Vlad portable from various islands off North Africa, and TL8TT the Italian DXpedition Team in Central African Republic. ZF9CW Jeff was active again from Cayman Island, E51AMF Manihiki Atoll North Cook Islands, H40DA Darren from Temotu Province of Solomon Islands, and JD1BMH Ogasawara. IOTA operations included H74B Big Corn Island Nicaragua, and HI1UD Beata Island Dominican Republic.

Upcoming DX

DXpedition activity scheduled for March includes the following:

J5UAP **Guinea Bissau,** 1 - 3 March. Peter HA3AUI returns to West Africa for a short operation using CW on 20 - 10 m. Start and end dates may vary. QSL via LotW or direct to HA3AUI. For more information see website. *http://cqafrica.net/*

9G5X **Ghana**, 7 - 21 March. A team of six operators will be active from Aburi near Accra on 160 - 10 m, with three high-power stations. They will make a special effort for VK. QSL via LotW or Club Log OQRS. For more information see their website. *http://www.ossett.net/9G5X/index.html*

9N7EI **Nepal**, 8 - 20 March. Eleven operators of the EI DX Group will be operating from outside Kathmandu. They will be operating up to 5 stations on 80 - 10 m, all modes. QSL via LotW or M0OXO. For more information see their website. *https://9n7ei.com/*

TU7C **Ivory Coast**, 9 - 19 March. Twelve operators of the F6KOP DXpedition Team will be active from Grand Bassam with 5 stations on 160 - 6 m, all modes. QSL via LotW, F1ULQ or OQRS. For more information see their website. *https://tu2017dx.wordpress.com/*

5U5R **Niger**, 9 - 20 March. A team of 11 operators will be active on 160 - 10 m, CW, SSB and RTTY. QSL via LotW or EA5RM. For more information see their website. *http://www.dxfriends.com/5u5r/*

T2 **Tuvalu**, 14 March - 4 April. Jacek SP5EAQ (T2AQ) and Marek SP7DQR (T2QR) plan activity from 80 - 10 m, SSB, CW and RTTY. Start and finish dates may be subject to weather delays. QSL via LotW or SP7DQR. For more information see their website. *http://tuvalu.sp7dqr.pl/*

EA9 **Ceuta & Melilla**, 15 - 22 March. Sigi DL7DF, Tom DJ6TF, Juergen DL7UFN and Frank DL7UFR will be active as EA9/home call on 160 - 10 m, CW, SSB and RTTY. QSL via LotW or bureau or direct to home calls. For more information see their website. *http://www.dl7df.com/ea9/*

See NG3K's "Announced DX Operations" website for a very up-to-date calendar of DX activations around the world. *http://www.ng3k.com/misc/adxo.html*

Other news

Just announced is a DXpedition to Saint Brandon Island (3B7), by the team who activated Juan de Nova last year and Tromelin in 2014. They plan a two-week activation in October this year. More details to follow.

Also in October, a group of several operators is planning a week each in Christmas Island and Cocos-Keeling Island in the first half of the month. More details in next month's column.

Please email me with any DX related news for inclusion in this column. I am particularly interested in hearing about DX worked or heard in other states. *vk3hj@wia.org.au*

73 and good DX,
Luke VK3HJ

DX Awards

Marc Hillman VK3OHM/VK3IP

Below are listed all new awards issued in January 2017, plus all updates to DXCC awards. Go to *http://www.wia.org.au/members/wiadxawards/about/* to use the online award system.

New awards

Antarctic

#	Call	Name	Mode
95	VK4CAG	Graeme Dowse	Open
96	VK4CAG	Graeme Dowse	Phone

DXCC Multi-band (1)

#	Call	Name	Mode	Band	Count
153	VK2TTP	Peter Pratt	Phone	20m	126
154	N2JJ	Jim Janack	CW	30m	216
155	N2JJ	Jim Janack	Phone	10m	215
156	VK2HOT	Donald Bruce Walker	Open	20m	113

DXCC Multi-band (3)

#	Call	Name	Mode	Band	Count
98	N2JJ	Jim Janack	CW	30-17-12m	612
99	N2JJ	Jim Janack	Phone	20-15-10m	470

DXCC Multi-band (5)

#	Call	Name	Mode	Band	Count
68	N2JJ	Jim Janack	CW	40-30-20-17-10m	1121

DXCC Multi-band (7)

#	Call	Name	Mode	Band	Count
33	N2JJ	Jim Janack	CW	40-30-20-17-15-12-10m	1516

DXCC Multi-mode (CW)

#	Call	Name	Count
248	N2JJ	Jim Janack	306

DXCC Multi-mode (Digital)

#	Call	Name	Count
62	VK5GR	Grant Willis	101

DXCC Multi-mode (Open)

#	Call	Name	Count
444	VK5GR	Grant Willis	103
445	JS3OSI	Toshiyuki Tanaka	130

Grid Square

#	Call	Name	Mode	Band
263	JS3OSI	Toshiyuki Tanaka	Open	HF

Worked All VK Call Areas HF

#	Call	Name	Mode
2366	VK2VEL	Edwin Lowe	Open
2367	N2JJ	Jim Janack	Open
2368	JS3OSI	Toshiyuki Tanaka	Open

DXCC updates

DXCC Multi-band (1)

#	Call	Name	Mode	Band	Count
12	VK3EW	David McAulay	CW	30m	318
97	VK6WX	Wesley Beck	CW	20m	121
135	DF2RG	Gerhard Jaeger	CW	20m	239
54	VK3EW	David McAulay	Digital	20m	183
137	DF2RG	Gerhard Jaeger	Digital	20m	223
146	VK2RT	Bruce Beresford	Digital	20m	112
17	VK6WX	Wesley Beck	Open	20m	194
20	VK3SX	Bob Robinson	Open	20m	317
41	VK7CW	Steven Salvia	Open	20m	305
59	VK5ADO	David Oates	Open	20m	135
75	VK2TTP	Peter Pratt	Open	20m	125
134	DF2RG	Gerhard Jaeger	Open	20m	306
138	VK4CAG	Graeme Dowse	Open	20m	254
145	VK2RT	Bruce Beresford	Open	20m	130
21	VK3SX	Bob Robinson	Phone	20m	317
39	VK6WX	Wesley Beck	Phone	20m	153
42	VK7CW	Steven Salvia	Phone	20m	262
136	DF2RG	Gerhard Jaeger	Phone	20m	250
139	VK4CAG	Graeme Dowse	Phone	20m	246

DXCC Multi-band (3)

#	Call	Name	Mode	Band	Count
24	VK3EW	David McAulay	CW	30-20-17m	866
37	VK7CW	Steven Salvia	CW	30-20-17m	724
88	DF2RG	Gerhard Jaeger	CW	20-15-10m	669
98	N2JJ	Jim Janack	CW	30-17-12m	612
66	VK3EW	David McAulay	Digital	30-20-15m	457
90	DF2RG	Gerhard Jaeger	Digital	20-15-10m	574
30	VK3SX	Bob Robinson	Open	20-15-10m	673
36	VK7CW	Steven Salvia	Open	30-20-17m	771
87	DF2RG	Gerhard Jaeger	Open	20-15-10m	851
91	VK4CAG	Graeme Dowse	Open	20-17-15m	622
31	VK3SX	Bob Robinson	Phone	20-15-10m	666
72	VK7CW	Steven Salvia	Phone	20-15-10m	501
89	DF2RG	Gerhard Jaeger	Phone	20-15-10m	706
92	VK4CAG	Graeme Dowse	Phone	20-15-10m	586

DXCC Multi-band (5)

#	Call	Name	Mode	Band	Count
21	VK3EW	David McAulay	CW	40-30-20-17-12m	1342
35	VK7CW	Steven Salvia	CW	40-30-20-17-15m	1097
60	DF2RG	Gerhard Jaeger	CW	30-20-15-12-10m	1040
64	OH8LXT	Veikko Pennala	CW	20-17-15-12-10m	817
58	DF2RG	Gerhard Jaeger	Digital	20-17-15-12-10m	795
34	VK7CW	Steven Salvia	Open	30-20-17-15-10m	1183
42	VK4CAG	Graeme Dowse	Open	20-17-15-12-10m	926
47	VK3SX	Bob Robinson	Open	40-20-17-15-10m	917
59	DF2RG	Gerhard Jaeger	Open	20-17-15-12-10m	1339
41	VK4CAG	Graeme Dowse	Phone	20-17-15-12-10m	868
52	VK3SX	Bob Robinson	Phone	40-20-17-15-10m	896
61	DF2RG	Gerhard Jaeger	Phone	20-17-15-12-10m	996

DXCC Multi-band (7)

#	Call	Name	Mode	Band	Count
10	VK3EW	David McAulay	CW	80-40-30-20-17-15-12m	1723
13	VK6IR	Stephen Chamberlain	CW	40-30-20-17-15-12-10m	1226
14	VK7CW	Steven Salvia	CW	40-30-20-17-15-12-10m	1445
31	DF2RG	Gerhard Jaeger	CW	40-30-20-17-15-12-10m	1367
32	VK6IR	Stephen Chamberlain	Digital	40-30-20-17-15-12-10m	900
15	VK7CW	Steven Salvia	Open	40-30-20-17-15-12-10m	1541
30	DF2RG	Gerhard Jaeger	Open	40-30-20-17-15-12-10m	1779
25	VK6IR	Stephen Chamberlain	Phone	80-40-20-17-15-12-10m	1399

DXCC Multi-band (9)

#	Call	Name	Mode	Band	Count
12	VK3EW	David McAulay	CW	160-80-40-30-20-17-15-12-10m	2035
1	VK3EW	David McAulay	Open	160-80-40-30-20-17-15-12-10m	2771
16	DF2RG	Gerhard Jaeger	Open	160-80-40-30-20-17-15-12-10m	2024

DXCC Multi-mode (CW)

#	Call	Name	Count
223	VK6WX	Wesley Beck	179
241	DF2RG	Gerhard Jaeger	320
245	VK4CAG	Graeme Dowse	127

DXCC Multi-mode (Digital)

#	Call	Name	Count
20	VK3EW	David McAulay	270
33	VK7CW	Steven Salvia	135
52	DF2RG	Gerhard Jaeger	288
58	VK2RT	Bruce Beresford	127

DXCC Multi-mode (Open)

#	Call	Name	Count
350	VK4CAG	Graeme Dowse	322
393	VK7CW	Steven Salvia	315
402	VK5ADO	David Oates	158
413	VK3WE	Rhett Donnan	140
431	VK2RT	Bruce Beresford	146
436	DF2RG	Gerhard Jaeger	327

DXCC Multi-mode (Phone)

#	Call	Name	Count
556	VK4CAG	Graeme Dowse	317
586	VK7CW	Steven Salvia	282

Contests

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

Contest priorities for March 2017

Contest	Date (UTC)	Rules	Difficulty	Software	Modes
ARRL DX SSB	4/5 March	*www.arrl.org*	Easy	N1MM any generic logger	ALL
RSGB BERU Commonwealth Contest	11/12 March	*http://www.rsgbcc.org/*	Easy	N1MM any generic logger	CW
John Moyle Field Day	18/19 March	*www.wia.org.au*	Easy Fun	VKCL N1MM any generic logger	ALL
Russian Dx Contes	18/19 March	*www.rdxc.org*		VKCL N1MM any generic logger	SSB /CW
BARTG RTTY	18/19 March	*www.bartg.org.uk*	Be Prepared setup well	N1MM any generic logger	RTTY
CQ WPX SSB	25/26 March	*www.cqwpx.com*	Easy but need to commit to 48 hours	VKCL N1MM Writelog and generic logger	SSB

March 2017 is one of the busiest on the Contest calendar with every weekend of the month having a major contest.

The mayhem peaks on the weekend of 18 and 19 March, when three major contests are all on at the same time.

Some ideas on entering the contests

John Moyle Field Day

This contest is one of the most active for Australian amateurs - get on air and have some fun. There is no pressure and it is a good rehearsal for emergency communications.

Look over the categories, as there are heaps of them.

CQWW SSB WPX

Owing to the time of the year the CQWPX is one of the best contests from VK. The propagation suits us as well as the scoring system. VK stations regularly feature in the top results. It is purely a QSO chase so work the bands that are open. One tip is to concentrate on 40 m and another is to follow the highest open band.

Contesters Tricks

Research and compare

Often we hear people saying XYZ Antenna is the best - but the question needs to be asked - compared to what? While many will feel that the new vertical is awesome until they come up against a full blown contest station they are oblivious to how good it really is. You can never have enough antennas or options - Contesting is all about bigger, better, faster and being well researched into when, where and why.

Question your station - question your abilities - Step outside your comfort zone and strive to make what you have the best it can be under the circumstances.

But I only have limited space!!! Then become very good at one band and one band only. Multiband stations require lots of room - or look at creating a portable setup; John VK4CT did this for many years and was a dominant station with this setup.

Contester of the month: VK3GK Lee Moyle

Lee Moyle VK3GK is well known in VK Contesting and DXing circles - He has operated from VK9N YJ0 DU1, YB9 and A35 and is a regular top place finisher in contests he enters.

What is your favourite Contest?
For HF the ARRL DX SSB contest in March is my favourite. Simply beam towards the USA and fire away. There are plenty of sections to enter and as a VK you have a good chance of getting a certificate for your efforts.
(That said the Oceania DX Contest is a very close second.....)

For "local" contests; probably the John Moyle Field Day, as you get to play both HF and VHF/UHF and go camping if you like too.

What is your favourite rig?
The main HF rig in the shack currently is an Icom IC-7800, a super receiver, lots of bells and whistles with excellent filtering. Even a couple of "guest" contest ops that use other brand rigs have commented on how easy and ergonomic the IC-7800 is to use.

For VHF/UHF I use an IC-9100, exceptionally sensitive receiver but still challenged in driving it. The IC-910H previously was quick and easy to use.

What modes do you contest in?
My main mode for contests is SSB. I will often enter a CW contest but

Photo 1: Lee Moyle VK3GK

usually just "Search and Pounce" (S&P) as my CW is still a "bit rusty" and I currently decode in my head, without skimmers and/or PC decoders. So this makes full on CW contesting quite fatiguing for me. Somehow the "apparent magic" a RTTY pileup has with some just hasn't happened with me yet, although I do give out some numbers and multipliers to RTTY contesters.

What is your favourite contest band and why?
Favourite band.....Well that would be 15 m, for me it seems to be the band that produces good DX contacts on which generally is a noise free band, as compared to 20 m and lower.

What is your preferred Contesting Software?
I prefer to use N1MM+ now; it has some really nice features and helpers. Prior to that, I used N1MM. For "local" VK contests/field days, VKCL is the choice.

What is your preferred Mic and Key?
For contesting the preferred "mic" is my trusty Heil Traveler Dual headset. A headset makes life so much easier and I run VOX so you need to keep "cool" even during those "heated" moments of DQRM etc.

The current key is a Bencher paddle but I have a much nicer one which I should be using, made by George VK2DLF: it's his "Paddle 902"...nice and smooth.

What is your "not so secret" weapon?
Probably the 3-el SteppIR; it really performs well, even at just 14 m on the Nally tower. Then the D40 40 m rotary dipole at 18 m is quite amazing too- excellent performance on 40 m.

What is your best tip to a newbie contester?
Decide if you are going to give it a fair crack or just have a good time collecting new DX contacts. Know the rules and remember to put a log in as you never know your luck at times. If you are going to give it a good go, evaluate your station and expectations and then choose the section you are going to enter that gives you the best opportunity to gain a competitive edge and maybe even a certificate for the wall.

What are your aspirations in contesting?
Currently I am operating just Single Op or Multi One but I hope to have a competitive Multi Two station in the suburbs set up in the very near future.

What would you improve in your skills and/or station?
I also need to hone my CW skills... practice, practice.....a good week on a DXpedition in a CW pileup really makes a difference, that's for sure.

I need to get the HF antennas on the second tower all functioning correctly and a couple of general purpose "multiplier antennas" set up.

Some streamlining of cables etc. and the two stations configured the same for easy maintenance if required.

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

Multi = Short for Multiple operator or transmitter

SO2R = Single operator 2 radio

VK4TS Trent is the admin of VK Contest Club (VKCC) web (*www.vkcc.com*) and Facebook pages and has been an active contester since the 1970s.

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

Spring 2016 VHF-UHF Field Day Results

Roger Harrison VK2ZRH

A Spring haiku

Spring air stirs in
silent rigs. Beams and dishes
turn to break the silence . . .

It appears there was something of a "changing of the guard" with this event. A significant cohort of entrants new to the Field Days (or returning from long absence) appeared, and a noticeable gang of 'old hands' were absent from the log submissions. Nevertheless, notable stalwarts have hung in there, such as Andrew VK1DA, Gerard VK2IO, David VK2JDS, Bernard VK3AMB, Gavin VK3HY, the EMDRC Super Station VK3ER, Doug VK4ADC, Scott VK4CZ, David VK5KK, Keith VK5OQ and the peripatetic Tim VK5ZT reprising his Rover act. Not a complete list, but serves to illustrate the point.

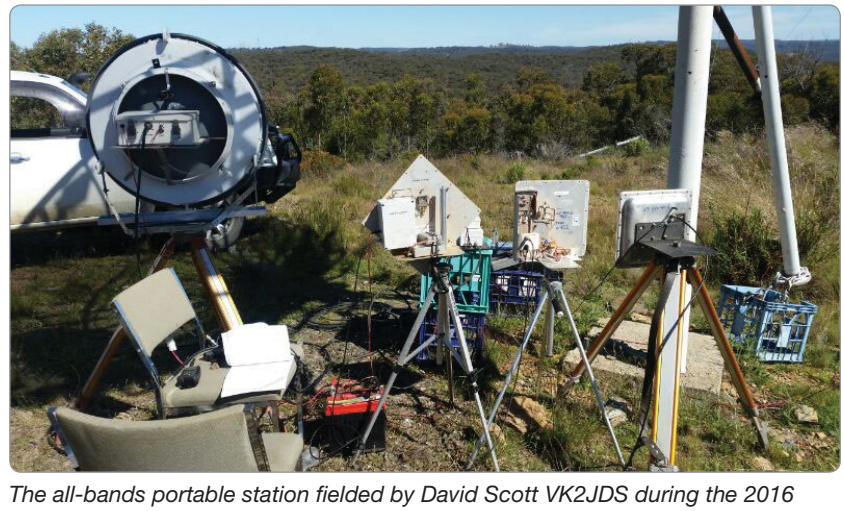
The number of participating stations ('participants') rose to 186 for this event, up 60 (47.6%!) from the Winter event. However, only 52 submitted logs, versus 70 for the 2015 event. Among the participants that did not submit a log, some 26 made at least 10 contacts. There must be a quite a pack of dogs out there that "ate the operators' homework (logs)". The ratio of submitted logs to total participants was 27.9%, a slight fall on the Winter event's ratio, which was 30%. Overall, Mike VK3AVV reports that, compared to the 2015 event, participation was down, in spite of generally good weather and good propagation. Fewer clubs and group stations ventured.

Four Foundation operators entered logs, one VK3 (VK3FCEK) and three VK5s: VK5FABG, VK5FBAA and VK5FPRN. Notably, newcomer Rodney Nitschke VK5FPRN took out the Top Scoring Foundation Station gong in both Divisions.

Support for digital operation, since it was re-introduced in 2015, has been "patchy". However, Hilary VK2IUW has plugged away at it over a few events, submitting a single-band log for contacts on 50 MHz in both Divisions for this event, a strategy that paid-off for him. Four other VK2 operators adopted an "all-digital strategy" in the All-bands category, which paid off for them. David VK2JDS, Justin VK2CU, Matt VK2DAG and newcomer Murray VK2UMZ racked-up some good scores in Division 1. Once-famous actress and comedian, Mae West, said "flattery will get you everywhere". Substitute 'strategy' for flattery when it comes to the Field Days!

The Single-band category is being addressed as a contest strategy by more stations. Those entering logs for this category more than doubled for this event, compared to both the 2016 Winter and Summer events. Oxley Region ARC's multi-operator station VK2BOR stuck to 6 m for the 8-hour portable section and it brought home the bacon. Likewise, Jim VK1AT, operating portable in Kosciuszko National Park, stuck to 2 m SSB in Division 2 to get the gong for the single operator 8-hour portable section. Home stations appear to have discovered the strategy, too. In Section C2, 8-hours, David VK3JL picked up top spot in Division 1, while Phil VK5AKK picked up top spot in Division 2.

Thirty stations entered logs for both Divisions, with 45 entering



The all-bands portable station fielded by David Scott VK2JDS during the 2016 Spring Field Day, from his mountaintop at Gowan, near Bathurst (altitude 960 metres; QF46pu). Left-to-right: 24 GHz on tripod with 2 foot dish; 6 m, 2 m, 70 cm and 23 cm handhelds on the chair as well as the FT-817, connected to all the transverters by BNC cables. Log sheets on chair, too. 6 cm transverter, 3 cm transverter on top of the cyan plastic crate. 2400 MHz and 3398 MHz on the tripods. AGM battery primary power source, charged by a 2 A solar panel. The blue crates in the background have 47 GHz and 76 GHz transverters on them, run from a separate 12 V deep cycle battery. All antennas aimed at the horizon. Changing bands involves swapping connectors and moving the FT-817 and log sheets, as required. Everything is powered up all the time to keep the OCXOs hot.

Division 1 and 38 entering Division 2. With 52 logs submitted (including the digital-only logs), 86.5% entered Division 1 with 73.1% entering Division 2. These ratios vary from event to event, so the result is unsurprising.

Logging

Mike VK3AVV observes that logging accuracy was proportionally much the same, although there was an improvement in the number of misreported cross-band contacts. Only one (11 in 2015) was determined to be on the wrong band, and only 6 (15 in 2015) that could not be resolved. This time, in the latter case, the lower-scoring band was used to work out the points for the contact in both logs. Mike also cautions that timekeeping in the logs requires more attention. Contacts should agree to within five minutes, but there were many cases where the difference ranged from six minutes to over two hours!

One area where there was a very pleasing improvement this year, Mike noted, was the format of submitted logs. Our exhortation to submit only digital logs has paid off. All logs could be imported, although a few did require a small adjustment to the header information as some fairly old versions of VKCL are still in use.

Congratulations and thanks

Congratulations to all the section / sub-section winners in each Division, as set out in the Results Summary, here.

Hearty thanks from me to Mike Subocz VK3AVV for his fortitude in checking logs and assisting in presenting these results. As many know, Mike is the developer of the free VKCL logging application, and has also developed the Field Day logchecking software. I must also thank Michael Binz VK3ALZ and Colin Hutchesson VK5DK for their work in reviewing the results and in helping with general adjudication of issues and 'problematic' entries. Don't forget that these results and a full table of all entries and scores are also published on the VHF-UHF Field Days website.

Next event

Winter 2017, over Saturday 24th and Sunday 25th June.

2016 Spring VHF-UHF Field Day Results Summary

Roger Harrison VK2ZRH

Division 1

Section A1 Portable station, single operator 24 hrs	
Single-band: Andrey Bondarchuk VK3WMM	24 points
Four-bands: Rodney Nitschke VK5FRPN	889 points
All-bands: Barry Bates VK5KBJ	2,255 points
Digital: Matthew Hetherington VK2DAG	2,258 points
Section A2 Portable station, single operator 8 hrs	
Single-band: Gregory Parkhurst VK1AGP	246 points
Four-bands: Darren Jury VK5DT	607 points
All-bands: David Minchin VK5KK	3,946 points
Digital: Murray Parnell VK2UMZ	1,358 points
Section B1 Portable station, multi-operator 24 hrs	
All-bands: Eastern & Mountain District RC VK3ER	6,459 points
Section B2 Portable station, multi-operator 8 hrs	
Four-bands: Derrick Harcourt VK2SF	216 points
Section C1 Home station 24 hrs	
Single-band Digital: Hilary Bridel VK2IUW	44 points
Four-bands: Bernard Petherbridge VK3AMB	1,270 points
All-bands: Ross Keogh VK3MY	2,618 points
All-bands Digital: Justin Lavery VK2CU	2,316 points
Section C2 Home station 8 hrs	
Single-band: David Rolfe VK3JL	309 points
Four-bands: Darren Jury VK5DT	727 points
All-bands: Gerard Sexton VK3CG	1,003 points
Digital: David Scott VK2JDS	2,125 points
Section D1 Rover station 24 hrs	
All-bands: Tim Dixon VK5ZT	4,797 points
Section D2 Rover station. 8 hrs	
No logs submitted.	
Top-scoring Foundation station operator	
Rodney Nitschke VK5FRPN. Division 2, Section A1 Portable station 24 hrs, *Four-bands*:	889 points

Division 2

Section A1 Portable station, single operator 24 hrs	
Four-bands: Rodney Nitschke VK5FRPN	13,955 points
All-bands: Barry Bates VK5KBJ	33,482 points
Section A2 Portable station, single operator 8 hrs	
Single-band: Jim Henderson VK1AT/2	3,118 points
Four-bands: Gerard Hill VK2IO	13,546 points
All-bands: Gavin Brain VK3HY	29,313 points
Section B1 Portable station, multi-operator 24 hrs	
All-bands: Eastern & Mountain District RC VK3ER	184,688 points
Section B2 Portable station, multi-operator 8 hrs	
Single-band: Oxley Region ARC	17,054 points
Section C1 Home station 24 hrs	
Single-band Digital: Hilary Bridel VK2IUW	4,630 points
Four-bands: Bernard Petherbridge VK3AMB	23,036 points
All-bands: Ross Keogh VK3MY	57,195 points
Section C2 Home station 8 hrs	
Single-band Digital: Phil Helbig VK5AKK	9,764 points
Four-bands: Darren Jury VK5DT	5,529 points
All-bands: Gerard Sexton VK3CG	6,727 points
Section D1 Rover station 24 hrs	
All-bands: Tim Dixon VK5ZT	34,874 points
Section D2 Rover station. 8 hrs	
No logs submitted.	
Top-scoring Foundation station operator	
Rodney Nitschke VK5FRPN. Division 2, Section A1 Portable station 24 hrs, *Four-bands:*	13,955 points
Multi-operator stations' listed operators	
VK2BOR: Lyle VK2SMI, Bob VK2ZRE, Keith VK2FPTL, Ray VK2JU, Larry VK2CLL, Henry VK2ZHE.	
VK3ER: Andrew VK3BQ, Peter VK3QI, Jonas VK3VF, Peter VK3ADY, Mike VK3AVV, Michael VK3MHY, Jack VK3WWW	

Plan ahead

GippsTech 2017 Annual VHF/ UHF/microwave Technical Conference | 1-2 July

The Learning Game

Tony Boddy ZL3DQ, VK2ADQ, VK6DQ

How times have not changed!

So many years ago – thirty five years in fact, yet the perception of my time on air seems short. It seems only yesterday when I first came on air.

My first rig was a little home brew phasing rig with a 6AG7 in the final, the other bits were solid state. The valve VFO was an external job, had to be because it was microphonic. Even touching the bench during operation was a definite no-no. It was a great little rig, nearly indestructible even in the hands of this newbie. I cheated with the receiver, it was a Tandy DX-160 that I used for short wave listening during the years preceding my on air debut on 4 July 1981.

My test gear was a BC-221 Frequency Meter, an el-cheapo multimeter and a borrowed grid dip oscillator. That gear plus the DX-160 enabled me to learn so much about tuned circuits and general radio practice. I lived radio, built so many experimental circuits, power supplies and my first antenna matching unit under the watchful eyes of my mentor Phil Howell ZL3RH. Actually I double cheated; there was an occasion or two that I did an on air test or two. Five watts from my old 6AG7 was not going to do much harm anywhere but it was surprising how far five watts would go. I even used the BC-221 as a CW transmitter by keying the antenna so I could send Morse to a mate several blocks away. That would have been down at microwatt level, but a 65 foot (20 m) long wire makes a good radiator on 80 m.

When I started my clandestine tune-ups with the warnings of "*Dip the plate or you will blow the final*" ringing in my ears every time I went on air: I can tell you I was pretty cautious. I found that maximum radiated power as indicated by my homebrew field strength meter and minimum plate current on the transmitter corresponded with what was written in the books. Yeah, I learned how to tune a final and into an antenna. I learned a lot about antennas too. My favourite for many years was an 80 m Windom with a single wire feed-line and my home-brew link tuner. It had a vertically polarised signal component as well as horizontal that gave me a good strong ground wave for local contacts and a fair go at stations further away. "*There is someone tuning up on the frequency*" was music to my ears but I was so frustrated not to be able to talk to them. They were at the opposite end of New Zealand to me but there I was, loud and clear. It is strictly illegal to go on air without identification. I do not recommend it nor would I do it today. I play it by the book.

Finally I sat the test; in those days there were only two opportunities a year to sit the amateur exam: March and September. Not only that, one had to wait six months for the results to come through. Passed! Yay! Good news and now came the Morse. There was no way I was going on air with a Technician call, for me it had to be a full call or nothing. I did that too, it was a long hard fight to get the 12 wpm a minute pass. Another long wait for my call and it came on the unforgettable date of 4 July 1981.

In the meantime, even though my little home-brew 6AG7 rig was OK, I developed a lust for more power and I really wanted a rig that was frequency agile. I scrimped and saved till I had enough to buy a used Yaesu FT-200. What a great rig that was. So much easier that the home-brew rig to use, the FT-200 became my work horse.

I made many contacts in that first year and can say that I thought I was doing pretty well. My first was pretty good according to the hams I worked on CW and I became a dab hand at dipping the plate every time I tuned up in fact it became second nature to me. What a gun operator!

Then one day I thought my world had come to an end. I heard a ham calling CQ on 80 m from the top end of ZL1. Went back to him OK and he said to me:

"Yer not very strong"!

What did he mean not very strong? I've got an FT-200 and I'm a gun operator. How dare he say I'm not very strong!

"No worries mate I've just checked my gear and everything is spot on. You should be getting a good signal".

"Yer still not very strong"!

"OK standby, I'll check the rig out and turn the wick up a bit".

"Yer still not very strong, can't 'ear yer".

What does he mean, can't hear me? I had already checked, turned the wick up a bit and he can't hear me. I cast an eye over the rig and saw an ominous glow from inside through the slots in the top panel. It's hot! I've blown the finals. Check again. Go back to him – 100 W on the power meter. Dip the plate. Dip the plate. Turn up the mic gain. 135 watts.

"That's as far as I can go, how's copy now?"

He comes back to me, by this time I am standing up watching my beloved FT-200 on its last legs galloping into a meltdown:

"Still can't 'ear yer"!

It's the end of the world for me, my rig has died, no output. What have I done?

Then out of the blue a different voice pinning the S meter, just about blowing me out of the room:

"So right son, yer 60 over nine here! Bill yer silly ole fool, put yer hearing aids in".

Just goes to prove that all is not as it first seems and it's all just a learning game.

ALARA

Diane Main VK4DI

Photo 1: Mark VK4IL (wheelchair), Tess, VK4FDDC, Paul VK4CPS, Mike VK4HS and XYL Val.

What is ALARAMeet 2017?

Every three years ALARA organises a weekend get together for YLs and partners somewhere in Australia.

When is it?

This year we will be meeting in Tropical Queensland at the Cairns Colonial Club from Friday 8 September to Monday 11 September 2017.

The venue was chosen for its beautiful location, set in lush tropical grounds and with on-site accommodation and well-appointed conference style facilities.

Lyn VK4SWE has been able to negotiate an excellent discount for the Meet both for the accommodation and the venue itself. We have block booked a large number of rooms and they will be available to our attendees.

Accommodation bookings must be made through the Meet committee at the time of full registration. Please do not call the venue to book.

Pre-registration is required so we can effectively cost the tour and events during the weekend of the Meet. The link to the website is *http://www.alara.org.au/alarameet/index.html*

The proposed program is listed here for those who are interested in attending. If you have never been to an ALARAMeet then this will be the one to attend.

The program has a number of concurrent activities so people can choose to just meet and chat, the partners can take a separate tour and we have radio related activities

Photo 2: Len VK4BLZ, Geoff VK4NIX and XYL Sarah VK4FURY and their son Cameron.

Photo 3: The venue for ALARAMeet 2017: the Cairns Colonial Club.

planned as well. The weekend has been planned to be different from those held previously, and will have a balance of fun, relaxation and information sessions. We want to reinvigorate the passion for AR that got us involved in the beginning.

If you are not a member of ALARA and want to attend, then please contact me, Diane VK4DI by email at *publicity@alara.org.au*

VK4

Australia Day saw a group of YLs and OMs from Toowoomba, Oakey, Brisbane and Ipswich descend on our ham shack property for a social BBQ and home-made pavlova!

Amongst the group were two newly licensed YLs in Sarah VK4FURY and Tess VK4FDDC.

The discussions mainly centred on antennas, new radios purchased and headsets. Along with demonstrations of DX Clusters, Logging software, propagation software and a great introduction to the wonderful world of AR along with offers of assistance to erect antennae and provide more mentoring amongst the group.

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Diane VK4DI

ALARA MEET 2017

Friday 8 - Monday 11 September 2016

Proposed Programme and Information (subject to change)

	Friday 8 September 2017
1200-1600	Registration and Lunch/ Afternoon Tea. Treasure Chests (Goody bags) and local information distributed.
	Bring items for the Display Tables: showcase our beautiful craft and handwork. Special QSL Cards, Awards, or Photo Albums of a special Holiday or Radio Activity also welcome too. Perhaps recipes for the ROTA Table?
	Possibly short tours of the Royal Flying Doctor Base, Bureau of Meteorology Office etc.
1700 until late	Dinner at own cost, recommend Tjapukai Aboriginal Night Fire; shuttle bus to town for Esplanade al fresco dining, night markets; shuttle bus back to Cairns Colonial Club Resort.
	Saturday 9 September 2017
0900	Opening of the Meet by the President of ALARA in the Jardine Room, Cairns Colonial Club Convention Centre
0930	Display Tables in the Jardine Room, or Eyeball QSO chat on the verandahs outside. Some static display tables of craft, restored Morse keys, DXpedition and travel displays. Interactive displays & demonstrations. Breakout sessions by Diane VK4DI on Logging Programs, SDR Radio and how to use EchoLink.
1030	"Smoko" = Morning Tea/Coffee and the Official Group Photos Session.
1100	*Optional Tour to the Australian Armour and Artillery Museum. Optional Joyrides available and a Shooting Gallery, interesting gift shop and coffee room.*
After Smoko	**TREASURE HUNT!** Form up into Teams and take part in a short Foxhunt among the tropical gardens.
1300	Lunch and Displays.
1400	Breakout Sessions continue.
1530	Afternoon "Smoko" - a selection of Tea, Coffee and Snacks
1600	Free time: relax around Resort Pools or take the 5 pm Shuttle Bus into town for some sightseeing/shopping at the Night Markets or walk around the Esplanade Pool or Marina.
1900	Tropical Night Dinner at Homestead Restaurant. Official Welcome Toast, and outline of tour day.
	Sunday 10 September 2017
0830	**Train or Skyrail to scenic Kuranda**. Meet at the top for Smoko and a visit to the Kuranda Markets.
	BUS tour of the Atherton Tablelands. **LUNCH - Mareeba Heritage Centre.**
1900	Gala Dinner at Cairns Colonial Centre Conference Centre Jardine Room. Themed Dinner: "Pirates! ARRrrr...! Putting the AR back into ALARA!" Official Closing of ALARAMEET.
	Monday 11 September 2017
0830	Optional Reef Trip.
1700	Return to Cairns port. Shuttle bus back to Colonial Club or nearby restaurants or the Night Markets and International Food Court.

SOTA & Parks

Allen Harvie VK3ARH

A Sherpa and Two Goats

All the action was in VK1 for the start of the year.

Andrew Moseley VK1AD 2016 SOTA Sherpa Award

Congratulations to this year's award recipient: Andrew Moseley VK1AD.

Thanks to Andrew VK3ARR.

Every year, Richard G3CWI and SOTABEAMS sponsors an award for the person who has contributed most or assisted the SOTA MT the most in the previous year. This year, we had some strong candidates but, ultimately, the MT all agreed that this year's recipient is the standout candidate and a worthy recipient of the award.

Andrew is very active in helping develop and promote SOTA. He is well-known in his association for the efforts expended in taking new activators out and for pushing the limits of his station. He acts as a de facto AM in many ways, helping produce the last summit update for his association. He takes a scientific approach to improving his odds of contacts, studying antennas and propagation conditions at different times of the day to different parts of the world. This year he has also run a challenge to qualify as many summits on 70 cm as possible, driving more use of this band in his region and his success at this, despite the remoteness of population centres, is indicative of the skill he possesses. His efforts have led to promoting contacts across the world, bringing the SOTA community together, including being one of the people helping instigate the VK-EU S2S event and now studying possible paths and times for a VK-NA event.

While some of these require people at the other end to help enable his actions or are parts of group efforts, the SOTA MT feels that combined, this person has improved SOTA, built the community, and pushed that community to experiment and try new things.

Congratulations again to Andrew VK1AD. *https://vk1nam.wordpress.com/*

Photo 1: Ian VK1DI on SOTA peak VK2/SM-053 working EU DX into Europe.

Ian VK1DI SOTA Mountain Goat

Ian started activating VK3 SOTA summits in Dec 2012 by travelling to the Victorian High Country, with first activation being Mt Cope VK3/VC-001. Having been bitten by the SOTA bug, he got involved with getting VK1 SOTA going, along with Andrew VK1DA, by surveying summits for SOTA MT and was the first to activate Mt Majura VK1/AC-034 when VK1 association went live on 1 February 2013.

Many years of experience in bushwalking in the ACT and surrounds proved useful in activating several VK1 summits, gaining first activation for popular summits like Mt Gingera VK1/AC-002 and Pheasant Hill VK1/AC-021.

Then he went on to contributed to getting VK2 SOTA going. This involved surveying the NSW South Coast VK2/SC summits and helped out with the surveying of the Southern Tablelands VK2/ST region. When VK2 went live on 1 September 2013 Ian was there to activate South Black Range VK2/ST-006 for the first time.

Ian continues to be active in the SOTA community and maintains a blog with photos and track logs. *http://vk1di.blogspot.com.au/*

While on holidays over the years Ian went on to activate summits in VK3, VK4, VK5 and many of the NSW Northern regions. Some memorable summits: Mt Warning VK2/NR-001, with its tiny summit and a python lying under the dipole, the Devils Peak VK5/NE-080 with a crazy rocky slope, Pigeon House Mountain VK2/SC-033 with ladders to the top and barely enough room for a dipole.

After four years of activating, Ian reached SOTA Goat-hood on 3 January 2017 with a reactivation of

Mt Majura. Goat noises were heard across the bands after qualifying...

Andrew VK1MBE SOTA Mountain Goat

Goat-hood finally arrived on 2 January 2017 with the activation of Mt McDonald VK1/AC-048. Accompanied by eldest daughter Emily and with 999 activator points under the belt, they completed the reasonable climb in good time and had a chance to enjoy the views down to the Cotter Dam and to the east to Canberra before setting up. Started on 2 m with the enthusiastic VK1 SOTA team, it seemed very appropriate that the fourth and qualifying contact was the holder of this year's Sherpa Award Andrew VK1AD. What followed on the air was a cacophony of goat like sounds; what a hoot!

The journey to Goat-hood was a long line of great adventures. In the 220 or so summits each one seemed to produce something interesting, whether it be a new challenge navigationally, physically or, particularly recently, battling the propagation.

Two of the memorable events on summits included finding a horse, complete with bridle and lead who was coaxed back to its owners 5 km away with an apple. Another was being confronted on a remote drive up a summit by a census collector who was lost.

Summit-to-summit DX QSOs are particular favourites for Andrew. It is very satisfying achieving a contact with another activator on a summit half way around world with basic ham equipment. Andrew uses an FT-857 mostly but for longer hikes the 600 gram 5 watt SSB X1M is deployed.

SOTA has so many dimensions to it but it's the community of activators and chasers that really makes the program. A special thanks to the VK1 SOTA team and particularly Andrew VK1AD, Andrew VK1DA, Al VK1RX, Ian VK1DI and Matt VK1MA (59++).

Photo 2: Andrew VK1MBE taking his final strides towards becoming Mountain Goat, Mt McDonald VK1/AC-048.

Congratulations to Andrew, Ian and Andrew and looking forward to an active year.

Some important 2017 dates for your Amateur Radio Portable Diary:

1 January - 31 December 2017: Amateur Radio Victoria VK3 Local Government Award Challenge: *https://www.amateurradio.com.au/awards*

18 & 19 March: John Moyle Field Day 2017. Consider going "portable" in this year's Field Day. All details can be found here: *http://www.wia.org.au/members/contests/johnmoyle/*

1 & 2 April: VK5 Activation weekend 2017. Keep a look out for Portable VK5 activity across this weekend or join in the fun across the border by visiting a few VK5 Parks: *http://www.vk5parks.com/4th-year-anniversary.html*

19-20 August: Join a Group and "Go Portable" for the International Lighthouse and Lightship weekend: *https://illw.net/*

10-13 November: Join in the fun during the seventh Keith Roget Memorial Parks Award activation weekend: *https://www.amateurradio.com.au/awards*

Allen VK3ARH

VHF/UHF - An Expanding World

David K Minchin VK5KK

Introduction

This month we have a roundup of Tropo conditions across VK/ZL as well as a report on the new national 47 GHz distance record. The regular section on EME continues as well as a new series dealing with digital antenna rotator controllers. To round all this up we have Kevin VK4UH's meteor scatter column.

Tropo Propagation – Did we miss something??

We are luckier than most areas of the world where we have two 2000+ km Tropo paths that sit mostly over water that regularly open on 144 MHz and above during the warmer months. In a normal (?) season the same weather systems influence both paths as they move from the Australian Bight path across to the Tasman path to New Zealand. Ultimately all this influenced by local ocean conditions, clearly in 2016/2017 there has been two entirely different scenarios on these paths!

Up to February, the normally reliable VK6 to VK3/5 Tropo path has yet to yield a stable opening for more than 24 - 36 hours. Unseasonal tropical moisture heading through the middle of Australia south through to Adelaide has turned things upside down on the Bight path for a few months. It looks like it will be mid-February before the Australian Bight moves into a more stable dry summer pattern. There has been little indicator of "GHz" opportunities; this may be the first year in a few years that the Bight has not been spanned on 10 GHz; only time will tell!

06-Feb-17	11:04	VK2MAX in QF68JV	ZL2WHO/B in RF70OM	432.271000	CW	519	2233.3
30-Jan-17	09:11	ZL1RQ in RF64SX	VK2BZE in QF55KK	432.100000	SSB	55	2069.7
04-Jan-17	12:40	VK6LD/P in OF84XX	VK5DK in QF02JE	432.100000	SSB	55	2067.2
04-Jan-17	12:41	VK5DK in QF02JE	VK6LD/P in OF84XX QSB to S3	432.100000	SSB	56	2067.2
30-Jan-17	08:55	VK2ZT in QF57WF	ZL1IU in RF64VR Has the antenna sitting on a hedge 1 meter high ...	432.100000	SSB	55	2042.0
30-Jan-17	17:36	VK2ZT in QF57WF	ZL1IU in RF64VR	432.100000	SSB	55	2042.0
04-Jan-17	12:15	VK6LD/P in OF84XX	VK5RSE in QF02FL	432.550000	BCN	559	2037.9
30-Jan-17	06:39	VK2ZT in QF57WF	ZL1RQ in RF64SX	432.150000	SSB	53	2014.9
30-Jan-17	06:39	ZL1RQ in RF64SX	VK2ZT in QF57WF	432.150000	SSB	55	2014.9
30-Jan-17	08:50	VK2ZT in QF57WF	ZL1RQ in RF64SX	432.100000	SSB	55	2014.9
27-Jan-17	21:16	VK5BC/P in PF85MC	VK7JG in QE38NN rx only, qsb	432.100000	SSB	51	1137.7
27-Jan-17	21:21	VK7JG in QE38NN	VK5BC/P in PF85MC Thanks Brian nice signl now	432.100000	SSB	41	1137.7
14-Jan-17	20:37	VK3ES in QF22HP	VK5AR/P in PF77IF	432.200000	SSB	59	1035.4
25-Jan-17	21:08	VK5PJ in PF95MK	VK7RAE in QE38DU	432.474000	BCN	519	971.8

Figure 1: Long Distance 432 MHz Reports for January 2017.

Meantime the VK2, VK3, VK4 to ZL path as well as towards FK8 from VK2 & VK4 has been good through January 2017. The middle of the Tropo pattern over the Tasman has sat in its usual spot off northern VK2 for a few days at a time also yielding some good Tropo up and down the VK2/4 coast. And as the tropical moisture that has been upsetting the Bight path has tended to dry up around the VK2/VK5 border, there has been some interesting propagation from VK3/VK5 to VK7. The table shows the 432 MHz reports (courtesy of VKLogger) for the peak periods.

New Australian 47 GHz Record

A new 47 GHz distance record of 177.9 km was established on 11/1/2017 between Alan VK3XPD/p and the team of Peter VK3APW/p and David VK3HZ/p. VK3XPD was located at located at Mt William (1167 m ASL) and VK3APW/HZ at Mt Sabine (576 m ASL) in the Otway Range east of Beech Forest. Both digital and SSB contacts were made; the latter reports were RS41 and RS53. An initial contact was made over a 149.6 km path from a location near Colac back to Mt William before VK3APW/HZ moved to Mt Sabine.

The Mt Sabine to Mt William path is probably the longest available optical "line of sight" path in VK3 (see diagram) from accessible hills. There was no reported enhancement from Tropo involved. In fact the Dew Point was >10 deg C for most of the path, signals reports would seem to be close to what would be expected in theory with water vapour and oxygen losses over the path. Attempts were made on 78 GHz but no signals were heard confirming that conditions were "average".

Records past this mark overseas have involved Tropo and invariably been during winter when the dew point is low or negative. The difference over a 200 km path on 47 GHz between "moist" and "dry" can be up to 20 dB in signal! The

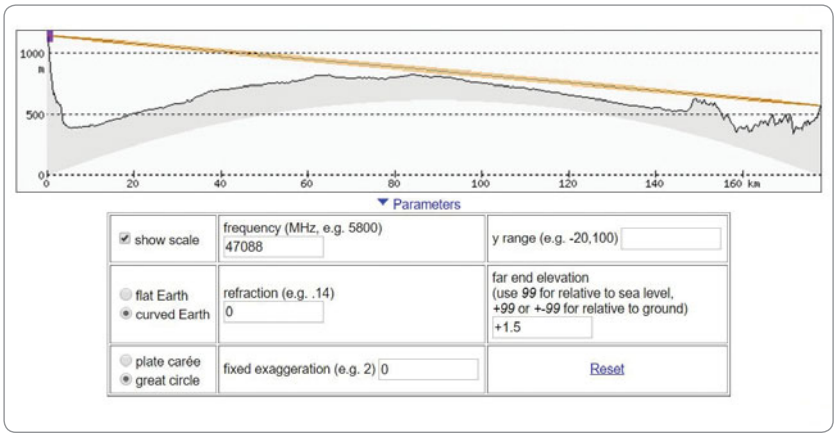


Photo 1: 47 GHz 179 km path from Mt William to Mt Sabine.

challenge has now been set in VK to go one step further.

Equipment: VK3XPD/p - OCXO-Locked Transverter, Kuhne 20 mW amplifier, Nurad 300 mm dish with a FT-817 IF. VK3APW/p and VK3HZ/p: OCXO-Locked New Kuhne Transverter, 80 mW output, Nurad 300mm dish and FT-817 IF.

For interest the diagram in this column is from the path profiling website "Hey What's That" that can be found at: *www.heywhatsthat.com*

Whilst there are a few path profiling websites (not all in English!), this one is very popular. You can set up various sites for your own use or to share publically to examine paths on the go. I've used this site for a number of mWave "DXpeditions". If you look you will find quite a few interesting sites (some commercial) as well as a number of amateur home stations!

EME Report – Moon Beacons

EME is a step by step challenge until you confirm that what your station is meant to be capable of in theory is actually met in practice. Clearly one of the main challenges in EME is hearing something from the moon!

If you have a small station you most likely will not be able to hear your own echo's and need to rely on a bigger distant station to be able to complete the circuit. For 144/432 MHz there are usually a few "Big Gun" stations on during EME contests that can be heard but for higher GHz bands it's a bit more difficult, especially if you are using the bare minimum of equipment. To bridge the gap, two groups in Europe have established "Moon Beacons" on 1296 and 10368 MHz that run whilst they have a moon window throughout most of the year.

ON0EME was established in 2012 at Lille, Belgium (JO10mp) and operates on 1296.000 MHz GPS locked. The beacon uses a pair of PE1RKI 250 W Power Amplifiers and a 3.7 metre solid dish antenna. Information on the amplifiers (and more!) can be found at *http://www.pe1rki.com/amplifiers.html*

The beacon activates when the moon rises 10 degrees above the eastern horizon to comply with licensing EMR requirements. The OE5JFL tracking system follows the moon with an accuracy of <0.4 degrees using HH12 12 bit absolute encoders from Georg DF1SR for both azimuth and elevation. BTW: We are going to talk about controllers more over the next few months, see the next section! When the beacon reaches 10 degrees above the western horizon it goes QRT and the dish antenna returns to the east for the next moon pass.

The beacon uses a CW ID on a one minute cycle signing "DE ON0EME" four times followed by 10 seconds of carrier and 20 seconds off time. The beacon output was originally 500 Watts however this was reduced to around 400 Watts after a failure in the output coupler that resulted when the drain of one of the PA FETs "arced and separated" from the PCB stripline. Luckily the FET survived! The beacon parameters can usually be viewed at *www.on0eme.org* but this site has been broken the last few months. The beacon is still operational however being reported only a few weeks ago.

You will need a dish antenna around 2.4 metres or greater in size to "audibly" hear the CW beacon. C band satellite mesh antennas are widely used on 1296 MHz EME and not too hard to find on Gumtree, etc. Using a program like Spectran or WSJTX you may see the signal in the waterfall display using a smaller antenna under optimum conditions. Don't forget to calculate the Doppler offset, polarization offset using VK3UM or similar software. For more information on the beacon email Walter ON4BCB at *on4bcb@gmail.com*

The DL0SHF EME beacon is run by Per Dudek DK7LJ *per@per-dudek.de* on 10,368.025 MHz from Keil-Ronne, German. This is just one part of a fascinating installation with separate dish antenna for 1296, 2320, 10,368 and 24,048 MHz EME. The site also hosts radio astronomy experiments as well as a fully operation receiving earth station contracted to NASA to track deep space probes. For more information go to *http://sat-sh.lernnetz.de/*

The DL0SHF beacon normally runs 50 Watts during the week but often runs full power from a 500 Watt TWTA on weekends. The 7.2 metre dish antenna has a pointing accuracy is <0.2 degrees! Its window of operation is similar to ON0EME, starting from 10 degrees above the eastern horizon and finishing 10 degrees above the western horizon.

A quick calculation using VK3UM software confirms that a 600 mm dish with a receiver with better than 1 dB noise figure will see and almost hear the beacon when it is running 500 Watts. I've

"heard" it a number of times on a 900 mm dish with everything set up correctly.

If you are going to go look for either moon beacon, be aware that may not be on for some periods due to weather or maintenance issues. More recently the DL0SHF beacon was off due to high humidity in the remote cabinet. It took some days for this to be rectified due to the snow build up at the installation. For either beacon you can also check operation by looking on the HB9Q EME logger if it is operating before you start to pull your hair out if you don't hear them! Go to *http://www.hb9q.ch/hb9q/index.php?option=com_users*

If you are active on EME, still working towards being active or would like to see something discussed please send me an email and I will include in this section.

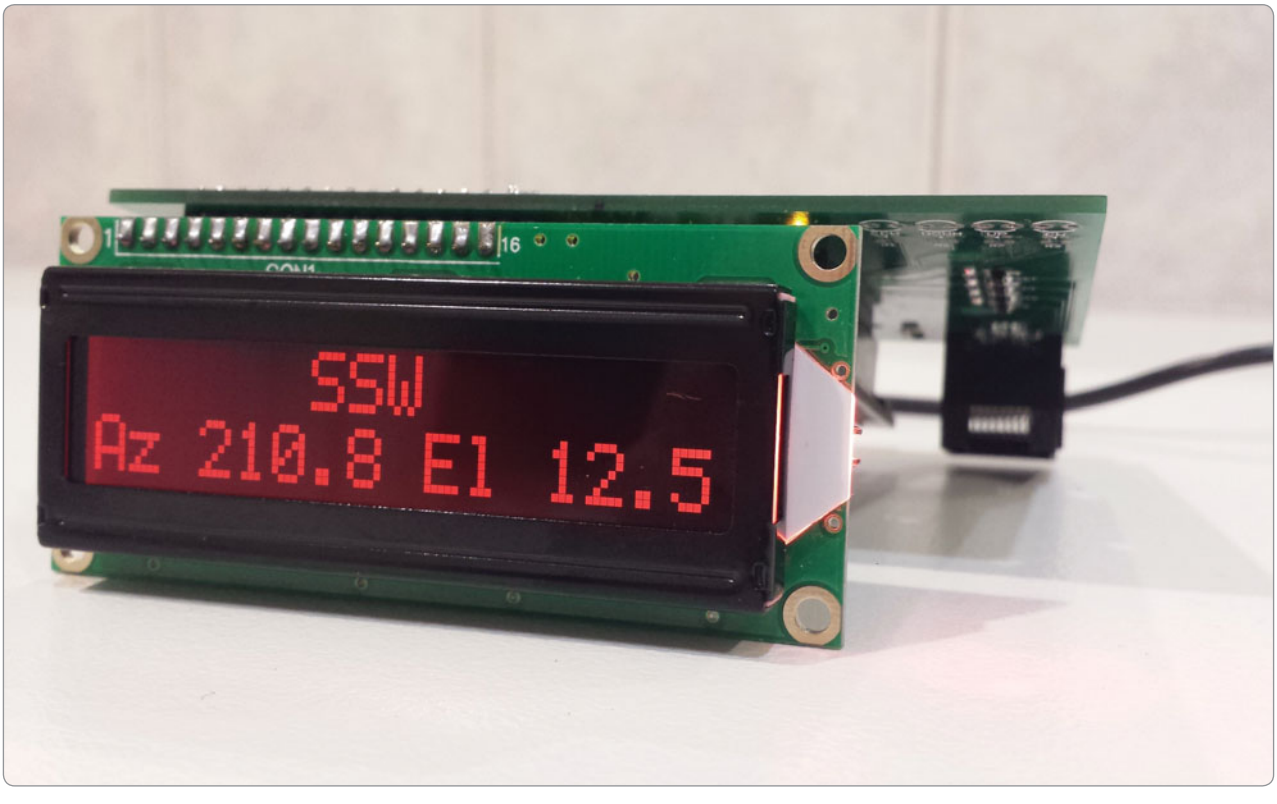
Digital Antenna Rotator Controllers Part One

If you are active on VHF/UHF and above from a home station you will no doubt have one or more rotatable masts, the antenna "rotator" is the part that makes this possible. The antenna rotators that most of us use are all descendants of the rotators introduced in the 1960s for TV reception. Development has seen them become quite robust; they can and do last a very long time. Unfortunately as this has been a low tech part of the hobby this also means that most in service are still using a controller with 1960's technology!

A rotator with a panel meter readout marked every 5 or 10 degrees might be OK for a 6 metre beam, but try and set the same antenna rotator to within a few degrees accuracy required by a high gain microwave antenna! Also you may have full digital control over your station from your PC/laptop to the point that you could operate WSJTX or SSB remotely yet you have no way to rotate your antenna from a PC. Even the most current rotator controllers still only have a RS232 connection for a PC, where is that socket on your Laptop or iPad?! All that aside it is probably time to update the last piece of old technology in the shack rotator controller with a modern digital readout and give it some connectivity to the outside world. There are quite a few options for upgrading rotator controllers that we will discuss over the next few months

Firstly there are a few considerations with an existing antenna rotator to get better accuracy pointing and readout. The direction indicator sensor in the rotator is the most important. Better than 90% of rotators simply use a linear potentiometer connected in some way to the main drive. Others do use a modern type "non-analog" sensor, the best way I could put it as there are a few different types! Surprisingly most potentiometer sensors are fairly linear and accurate across a 360 degree range to within a few degrees. The biggest problem usually is wear and

Photo 2: M0UPU version of the K3NG Arduino Controller.



tear creating bad spots causing the needle dance as a rotator goes across a spot!

Backlash in a rotator is the next consideration. Older rotators can have 3 to 5 degrees of "slop" depending on how worn the gears are and the amount of grease around them. If the rotator has a working brake then you can usually lock the rotator in the "right" spot so this does get around the problem to a degree. If your rotator is in good condition and a few degrees of movement isn't going to be a problem then you are fine. If your rotator is a bit worn a service is probably in order to bring the old rotator up to speed.

Now if you are setting up an EME station or want to use the lunar orbit satellites being launched next year you are going to use something other than a standard rotator. You could be using it something borrowed from the satellite industry or it could be completely home brewed mechanical arrangement with 0.1 degree precision (like that used with DL0SHF?!). Motor control will probably no different to that used with a standard rotator, what is called an H bridge will usually be all you need. You will need better accuracy than the few degrees a potentiometer is capable of; there are a number of alternatives for position sensors that we will talk about in future parts.

The popularity of educational and "Maker" computing has led to many kit or scratch build projects being developed based on ready-made modules. Some have been described in *AR* magazine over a number of years. Most are inexpensive with software that is accessible; which one you go for just depends on what you want to do and how much time you have. Over the last few years I have built a wide variety of controllers for various purposes; in future parts I will go over the ones that worked best! Next month we will start with the more basic ones like the one in the photo based using an Arduino Uno and K3NG software. For information on the K3NG project that one go to: *https://github.com/k3ng/k3ng_rotator_controller*

In closing

It was hoped that we would have an "out of the box" review of the LimeSDR this month but the second shipment has yet to leave the USA. See how we go for next 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 it in the column.

73

David VK5KK

Meteor Scatter Report

Dr Kevin Johnston VK4UH

Writing this report in January, I am reminded that this represents my fourth year as the compiler of this Meteor Scatter (MS) column. Looking back on the year and the summer holiday period, the time typically associated with the best of the annual "VHF and Up" operating conditions, I don't think 2016 was particularly memorable. Sporadic E (Es) and Tropo openings this season have been unremarkable and conditions observed, even during the best of the years Meteor Showers (Eta-Aquariids in May, Perseids in August, Leonids in November and Geminids in December) were uniformly disappointing from all reports received.

On the upside, there has been a wealth of activity and energy dissipated in the development and enhancement of digital modes specifically for digital Meteor Scatter operating and the release of several complete software platforms. Those following this column over the year will have seen descriptions of new modes including JTMS, JTMSK, ISCAT-a and -b and MSK144 and their comparison with the more familiar FSK441 and the original ISCAT mode. Also, the release of several complete software platforms including MSHV and the new WSJT-x all donated, without cost, to the digital amateur community.

The value of the internet based "VK-logger" facility, as an aid to Meteor Scatter operation, has been repeatedly recognised through the year and the appearance of the new "OZ-logger" notice board, with a page dedicated to Meteor Scatter Propagation in VK and ZL, was very welcome. The sporadic output of the "MS e-mailout list", from this keyboard, has attempted to disseminate information and reminders about forthcoming Meteor Showers etc.

Anyone wanting to be added to this mailout is welcome to drop the author their e-mail address. 2016 also saw the successful creation of several "Facebook" pages from within social media, serving various interest groups within the hobby, including those for "VHF UHF Microwave VK-ZL Amateurs", "Oceanic VHF UHF & microwave" and "Amateur (Ham) Radio Australia" as examples. All cater for the rapid dissemination of information, the sourcing of solutions to problems and the polling of opinion.

A new "Meteor Scatter VK-ZL" has just been created with the intention of disseminating information about MS activities, forthcoming Meteor Showers and provides a forum for discussion and advice. It's new and will reply on input from the community to make or break it. All interested operators are invited to apply for access.

As usual over the year there has been a flux of operators in and out of the Meteor Scatter scene. The general level of activity from my own overview, on 2 m MS at least, has seen a slight decline, as judged by the number of stations regularly making an appearance on the weekend morning activity

periods. The reverse however is true of the 6 m MS scene. It is very rewarding to see a steady flow of new callsigns appearing on 50.230 MHz each weekend. As with any new technique however, the "learning curve" for new operators is steep at the bottom and can be quite daunting. Not all the nuances of the required operating practices and protocols are immediately apparent. Further, the practices and protocols that have been tailored to suit the geographic conditions within this region are different to those used either in Europe or North America. Some internet sourced material about MS operation elsewhere in the world contradicts our local practices.

During digital Meteor Scatter operation, especially during the activity sessions on Saturday and Sunday mornings, there will be many stations all around the country, all operating on the same frequency and all at the same time. Most if not all of those other stations will be inaudible to each other except for the brief periods of meteor reflections. Probably the most critically important concept to master therefore is transmission "timing". If the wrong selection is made, then there is the potential for enormous and often unrecognised QRM to all other stations even where none are in direct range.

At the time of writing most digital MS operation is still conducted using the FSK441 mode during the weekend morning activity sessions. The same timing protocols however would still apply to other newer modes. In VK the activity sessions run on Saturday and Sunday mornings between around 19:00 UTC to around 21:00 UTC. This early morning activity takes advantage of the signal enhancement for MS around dawn. The activity frequencies within VK are 144.230 MHz and 50.230 MHz (primary focus frequencies).

In common with other digital modes, FSK441 divides each minute into two 30 second transmission periods. First period runs from the top of the minute (0 seconds) to the bottom of the minute (30 seconds) and Second period then runs from the bottom of the minute (30 seconds) back to the top (59 seconds). Obviously, two distant stations can only communicate each other via Meteor Scatter if they are transmitting in opposite periods, one transmitting and the other receiving at any one point in time. At the same time however, there may be many other stations, close by, also transmitting on the same frequency as you.

These stations of course are not heard and do not cause interference to you because they are not transmitting when you are receiving. Your signal does not cause QRM to your local neighbour stations for the same reason. However, if the wrong transmission period is selected then neither station can operate, if they are in direct range of each other, as both will be hearing constant signals from each other throughout the time when they are trying to receive the distant meteor pings. Even if your station is not in range of any locals, and hence you do not suffer any direct QRM when you are receiving, if the wrong transmission period is selected then stations attempting to call you would have to select the wrong timing as well and may suffer the same QRM issue in their local area. In a situation parallel to the road rules where we all have to drive on the correct side of the road, the section of the correct transmission period is essential for success and the avoidance of traffic conflict – even if other countries do it differently. The same principal applies in aviation where different flight levels are used by aircraft travelling in opposite directions.

So, what is the correct timing period to use? The answer is "that depends" on where you are and what day it is.

Clearly as licenced operators we could do whatever we choose within our licence conditions in terms of frequency and timing etc. We could call CQ on top of a QSO already underway, or transmit SSB on the output of a local FM repeater. We could run JT65 on top of a DXpedition station. We could but we don't, it just not what we do.

Within VK, a timing protocol has developed to give all operators an opportunity to work distant stations during specific activity periods, recognising the high potential for mutual interference from nearby stations operating at the same time and on the same exact frequency. The basis of this protocol is determined by call area and day of the week. I stress however that this only applies to the designated activity periods but is applicable to both 2 m and 6 m operation.

Transmission period selection protocol during activity sessions. See table below.

So to the rule of thumb:

Northern States ALWAYS run 2nd period and beam SOUTH.

Southern States ALWAYS run 1st period and beam NORTH

Stations in the middle states (VK 1 & 2) Beam SOUTH on Saturday and run SECOND period and change to beaming NORTH, running FIRST period on Sunday.

"So if I am in Canberra and its Saturday – how do I work the stations in Brisbane?" Simple answer – come back tomorrow!

"What if I am in Hobart and I want to try and work stations in Melbourne – how do I do that?" Simple answer- you can't! At least you can't on the normal call frequency during the formal activity session. Perhaps arrange contacts on the secondary call frequency well away from the call frequency or try at a different time outside of the activity periods.

DAY	First Period – Beaming NORTH	SECOND PERIOD- Beaming SOUTH
SATURDAY	VK3, VK5, VK7	VK4 & VK1, VK2
SUNDAY	VK3, VK5, VK7 & VK1, VK2	VK4

Points to remember, this protocol was devised specifically for the VK MS environment to give everyone the best chance to work long distances. Other protocols and activity times were established for MS operation between VK and ZL and for working Special Event/DXpedition stations. There is a secondary MS focus (call) frequency (144.330 MHz) in the current WIA 2 m band-plan but not in the revised 6 m band plan, at the present time. These secondary frequencies are intended for use during special event activities, Trans-Tasman operation or cross-timed interstate activity during normal activity sessions or for the use of other non-compatible digi modes to prevent interference and confusion. On 6 m the logical secondary frequency 50.330 was lost to the beacon extension portion of the new VK band-plan and was too close anyway to VK5RBV beacon for stations in South Australia to use without significant de-sensing. It has been suggested that the frequency 50.550 MHz, designated for "all modes" in the new WIA band-plan, could be used as a de-facto secondary MS focus frequency for 6 m.

On Australia Day on 25 January (UTC date) 2017 a number of stations became active using the AX prefix in place of the usual VK. As AX4UH (QG62kp) I was successful in making a number of Meteor Scatter contacts on 2 m and 6 m. Although conditions were below average it proved possible to complete with Arie VK3AMZ (QF22FE) on 2 m using FSK441 mode. This was followed by a series of successful MS QSOs with Arie on 6 m using almost all of the currently available digital MS modes. Completions were achieved on FSK441, JTMS, JTMSK, ISCAT-a, ISCAT-b and finally the new FEC mode under development MSK144. More trial sessions are planned for Sunday mornings on the secondary call frequency 144.330 MHz, in parallel to the normal operating periods, to allow stations to test and gain familiarity with the new modes. Since none of the current modes are inter-compatible, only FSK441 mode should be used on the primary focus frequencies 50.230 and 144.230, during the main weekend activity sessions at this time and all stations are urged to adhere to the timing protocols, outlined above, on both bands.

Meteor Showers

The next major Meteor Shower event for 2107 will be the Lyrids expected around 22 April and then the Eta Aquariids expected around 6 May.

Contributions for this column are as always welcome. Please e-mail to *vk4uh@wia.or.au*

Also I hope to see activity from the community on the Meteor Scatter VK-ZL Facebook page in due course.

Kevin Johnston VK4UH
Brisbane

Redfest and Q-Tech Conference

Saturday 22nd April 2017

The Redcliff and Districts Radio Club proudly announce their intention to host the Inaugural Q-Tech conference to coincide with the 2017 Redfest Convention on Saturday 22 April 2017.

Both convention and conference will be held at the St Michaels College near the Abbey Museum in Caboolture Queensland: the same venue as previous years' conventions.

The Q-fest conference is an entirely new initiative and will be comprised of a whole-day programme of technical lectures and practical demonstrations on subjects of wide interest to the hobby of Amateur radio.

The presentations will be provided by invited Speakers with particular interest and experience in each specialised field. The presentations will utilise the full range of audio-visual teaching facilities of the college intending to produce a first-class technical experience for all those participating.

The entire conference will be recorded and made available as a series of audio visual presentations and also complied into a printed version.

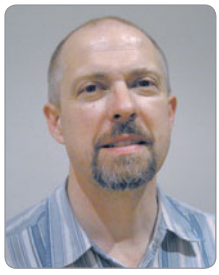
It is anticipated that the conference will attract speakers and attendees from interstate and full catering facilities will be available. St Michaels College is within an hour of Brisbane's domestic and International airports, a main rail link and the Bruce Highway. The nearby Bribie Island is a popular holiday resort and an area of outstanding natural beauty located on Morton Bay.

A list of convenient accommodation for those requiring it will be made available closer to the date. It is likely that subsequent conferences will expand and be held on entirely different dates from the regular Redfest conventions.

Full details will be available on the R&DRC club section on the main WIA website closer to the event *http://www.redclifferadioclub.org.au/*

Kevin Johnston VK4UH

Convener



VK7news

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

VK7 Event News - Meet the Voice 2017

The annual "Meet the Voice" barbecue and presentation of the Sewing Circle Trophy will be held at Ross just outside the caravan park on the banks of the Macquarie River on 19 March 2017. This event is a great time to catch-up with amateurs from around VK7 and have eye-ball QSOs and "Meet-the-Voice"! Presentation starts around 11:30 am and there will be great raffle prizes and all proceeds go to repeater maintenance around VK7. It is a BYO BBQ event and if you have a portable BBQ please bring it along and share. The great website contains all the information and pictures of previous events. *http://meetthevoice.org/*

VK7 Repeater News

NTARC: David VK7JD and Peter VK7PD let us know that over the Christmas break Murphy did take a break. Literally – he broke the antenna on VK7RBH at Legges Tor on Ben Lomond. Thanks to Grant VK2GEL who was visiting and doing a SOTA activation: he took a closer look at the repeater and let some-one know of the damage. Testing did reveal that it was severely down on power/signal level. Thanks to Joe VK7JG, Al VK7AN, Ross VK7ALH and Peter VK7PD who made the trek up to fix and replace the collinear fibreglass cover tube. Alan VK7AN also activated Legges Tor VK7/NE-001 for SOTA. This is thought to be the highest repeater in Tasmania and Joe's frost bitten hands can attest to that!

Remember Murphy? The NTARC repeater at Snow Hill VK7REC decided to fail. Thanks go to Andrew VK7DW who has a holiday shack on the East coast and was able to retrieve and deliver to Joe VK7JG for repair. Dry solder joints were found to be the culprit and the unit was returned to Snow Hill and installed; however, soon after leaving the site, it failed again. The crew returned and removed the repeater and it was found to be defective components in and around where the dry solder joints were! The repeater was returned a few days later and the voice repeater installed and tested. The APRS digipeater on the site which had gone

Photo 1: The repair crew L toR: Joe VK7JG, Ross VK7ALH, Peter VK7PD and Alan VK7AN (taking picture) having lunch on Legges Tor. (Photo courtesy of Peter VK7PD.)

faulty earlier was removed and it was found to have power supply issues and this was returned to the site by Andrew VK7DW on a trip back to his shack, thanks Andrew. A huge thank you also to Joe VK7JG, David VK7JD, Hayden VK7HH, Peter VK7PD, Ross VK7ALH and Al VK7AN who keep all these repeaters working for us all.

In Hobart there is a new DMR repeater thanks to Clayton VK7ZCR and David VK7JD: frequency is 438.525 MHz with a -5 MHz offset and it is located at Lenah Valley. If you need information about DMR or programming please contact Clayton on mobile 0466 588 193 or email: *clayton7008@gmail.com*

Northern Tasmanian Amateur Radio Club (NTARC)

http://www.ntarc.net/

NTARC held their January BBQ Meeting on the 14th and thanks to Idris VK7ZIR, Andre VK7ZAB and Alvin VK7ADQ who were the chefs on the day. The BBQ was followed by a general meeting to prepare for the AGM in February.

Thanks to Peter VK7PD for the following Summer VHF/UHF Field Day participation report:

Joe VK7JG and Peter headed to Mt Horror in the North East for its excellent view of Bass Strait. Equipment included 50, 144, 432, 1296 MHz, 3.4 and 10 GHz bands and Hepburn looked promising although gale force winds were forecast and they hit! The SHF tripod and dish was lashed to the look-out to stop them blowing away. Peter also made a SOTA activation. Six contacts were made into VK3, 5 and 7 (including Flinders Island) on 50, 144 and 432 MHz bands but unfortunately no 1.2, 3.4 or 10 GHz contacts were made. Those in the South of VK7 decided to operate from home rather than deal with gale force winds on mountains!

Radio and Electronics Association of Southern Tasmania (REAST)

http://www.reast.asn.au/

The 23 cm QSO parties have continued in 2017 with an average of eight stations participating after the WIA and VK7 broadcasts on Sunday morning and have provided some good opportunities for Ross Hull contest contact points to be collected. There has been a band of operators in the South and North of VK7 using the new WSJT QRA-C or Q-ary Repeat-Accumulate code and this is proving to provide around a 2 dB improvement on deep search in JT65 and about 5 dB better in working random stations where Deep Search cannot be used. Thanks to Rex VK7MO for that information. Occasionally the conditions are even good enough to operate SSB between the North and the South on 23 cm.

Linux Conference Australia – Open Radio Mini-Conference

Thanks to Ben VK7BEN for the following information.

On Monday 16th January 2017 many members of the VK7 amateur radio community participated in the one day Open Radio mini-conference held as part of the weeklong Linux Conference Australia 2017 event at Wrest Point Convention Centre in Hobart. The presentations included:

- SatNOGs satellite ground station by Scott VK7LXX
- Hamlib Support for OpenSDR (built at a previous conference) by Paul VK1ATP
- Are you ready for Amateur Radio by Ben VK7BEN

Overview of the HPSDR and piHPSDR by Justin VK7TW

- Forum - panel on the future of open radio and
- 10 GHz Earth-Moon-Earth by Rex VK7MO.

All sessions were recorded and are available on the Conference YouTube channel at: *https://www.youtube.com/user/linuxconfau2017*

It was interesting to note another of the main presentations at the conference was by Steve Conklin AI4QR and was on the mini-conference forum who presented on the progression of the Phase 4 Geosynchronous satellite efforts and his talk is also available on the link above.

The Satellite Experimenter's Night have been popular with many coming along getting involved in the planning, programming, tracking (antenna waving... hi hi), doppler-shift tuning, path-calculating and decoding, We have been able to hear many beacons and contacts and have been able to track and hear our return signal so, we are set for making contacts on the birds! We are usually active Wednesday nights between 1930 and 2100 AEDST. Hope to hear you?

We have had some great show and tell with the author's all-in-one HPSDR Hermes radio complete with Alex bandpass filters, 20 W PA and piHPSDR unit all mounted in in a nice 19" rack unit. We have also seen 70 cm circular polarized Lindenblad antennas, Tesla coils lighting up fluoro tubes and showing standing waves, recent SOTA activations, upgrades to Yaesu MH-31 mic and a 100 W Codan PA being used with ANAN SDR, thanks Martin VK7MA. Check out the REASTTAS Facebook page events for more details: *http://www.facebook.com/reasttas*

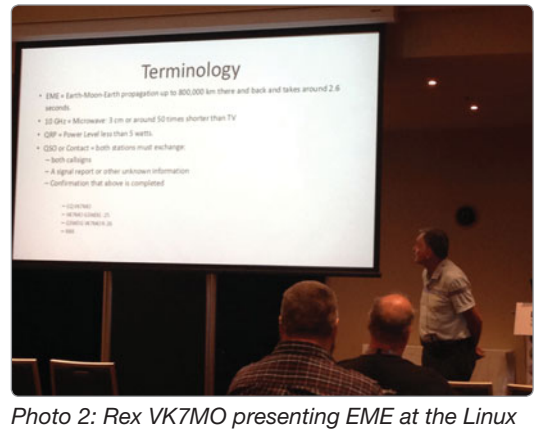


Photo 2: Rex VK7MO presenting EME at the Linux Conference 2017. (Photo courtesy of Justin VK7TW.)

VK6news

Will McGhie VK6UU

All our thanks to Keith VK6RK for writing VK6 news for several years. It is at times a difficult job, as amateurs are often not forthcoming when it comes to providing news for such a column. I wrote VK6 news for a few years back in the early 2000s and also a column devoted mainly to voice repeaters for 10 years. I found the Repeater Link column easy to write, as you write best about what you know.

Looking back through *Amateur Radio* magazine and VK6 news in particular, there has been large gaps, sometimes of more than a year. Also for several years the state news was just a loose insert and is easily lost for historical use. The reason for this change from state news being part of *Amateur Radio* magazine to a loose couple of pages was that the state news was taking up too much room. This gradually changed back to what we have today.

I'm only filling in for VK6 news for the month of March, as a volunteer has been found and Steve VK6SJ can introduce himself in the April edition of *Amateur Radio* magazine. Please send material to: *steve@kennedy-sj.com.au*

VK6 happenings

So, in general, what is happening in VK6?

I had a break from being involved in amateur radio, mainly because I believed the large high voltage power lines nearby would render my new QTH too noisy. Venturing back onto 2 metres showed that the noise level was not as bad as I expected. I eventually fired up the old TS-120 and with a bit of wire discovered the noise level also fairly low.

Moving along a couple of years and the purchase of a new HF transceiver, I discovered one big change in HF SSB operation, frequency stability. I was used to riding the clarifier and never really liked the sound of SSB. I could not believe everyone was on the same frequency and the audio quality was good, almost FM quality sometimes. Also, another big change was the huge drop in the cost of amateur equipment. Radios we paid thousands for were now only hundreds and the new SDR radios are amazing with the graphical display.

Photo 1: The IC-RP1220 repeater unit.

The other big change in VK6, along with the rest of the amateur World, is of course the digital revolution. In VK6 there are D-STAR, DMR and C4FM (Fusion) repeaters. Also a growing network of FM repeaters is being linked by the All-Star system throughout the South West of VK6.

NCRG News

23 cm Repeater for Perth

The NCRG is adding its support to install a 23 cm repeater in Perth. 23 cm repeaters have just not happened in VK6, for reasons unknown. I (VK6UU) ran a test 23 cm repeater for several months using two Yaesu FT-2311r mobiles with surprising results. 23 cm does not radiate well through vegetation, building etc., but it has one big advantage, the very low noise level on 23 cm. Mobile, the signal from the repeater was often S0 to S1 but completely noise free. Mobile flutters were more of a buzz than the usual flutter effect on the lower bands. It is to be an exciting addition to the almost unused 23 cm band in Perth.

By the way there is a relatively cheap source of brand new 23 cm duplexers from Finland. *http://www.duplexers.eu/about_us/uk/* I purchased one of these for a cost of $337 delivered. It is a 5/4 wave design, so don't be fooled by the size as shown in the photograph. I was able to achieve -90 dB notch depths with 1 dB pass attenuation. They do come tuned to your selected frequencies.

News from WA VHF Group

2017 definitely appears to be one of those years where more energy and research will be invested by the members of the Group to upgrade the current radio beacons operating within West Australia. At present there are currently only 4 beacons operating at full capacity and one at 30%; that is the 2 m GPS-locked part at Mt Barker, VK6RST. During the course of 2015-16, sites Bunbury VK6RBU, Augusta VK6RSW and Esperance

Photo 2: The 23 cm duplexer.

VK6REP were lost and we are now looking for new sites for continued operation. Anyone who knows of possible new sites would be most welcome.

Most beacons at present rely on CW; other modes like JT65, JT4 and PSK31 etc. may have worked at lower frequencies but the microwave region was limited to the low end. Progress towards more frequency agile signal sources such as ADF5355 which operate in the region of 54 MHz to 13.55 GHz could provide a more viable signal source and new beacons will probably be forthcoming.

Activity Days have been added to the Group's repertoire over the last year and have been very successful with the members and visitors. It is giving the members a chance to get together to swap stories and there are a couple of projects running from discussions at the open days.

Wireless Hill Museum in Ardross has a new exhibit on Morse code opening 19 February 2017 to the end of June called "The Wire, a History of Morse Code in WA", check times on *www.melvillecity.com.au/wirelesshill*

New members are always welcome. Our meetings are still on the fourth Monday of each month and the activity days are first Saturday of each month, for information check out *www.wavhfgroup.org.au*

Thanks to Terry VK6ZLT for the beacon report.

From Ty VK6HTY

73

Will VK6UU

VK5news Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

Happy New Year to everyone

Like most clubs, December and January are social rather than serious activity months.

AHARS had a very successful End-Of-Year Dinner at the Belair Hotel. There were a few glitches when people, who had not notified the President, arrived but the most serious glitch was a "telephone" glitch. President Barry asked for seating for 60 but the hotel heard it as 50!! In the modern technological age you would not expect that problem. However the hotel coped with the glitches successfully and everyone enjoyed their meal.

It was good to see how people moved around to speak to other tables and mixed very well indeed.

The January Picnic

Again there were about 60 people at the park beside the Bridgewater Mill. The trees are big enough that the shade simply moves across the park as the day goes on. There is a most interesting view across the creek (which was running because of the recent rains) where there were many families enjoying the play equipment as well as paddling in the creek.

One recent addition to the park is the flying fox. I don't think it stopped all day. Kids of all ages seemed to be able to enjoy it safely. The whole park has been built and is maintained by the Lions Club. They also brought their cooking van along and supplied our members with a variety of meats. AHARS members brought along either a salad or a dessert plate but none of the members had to actually cook over a hot plate as they used to do.

AHARS website

This has been fully upgraded and is a joy to use. It is easy to navigate and will keep everyone well informed of the Society's past and forthcoming activities. The next General Meeting will be the AGM on the third Thursday night in February. There will be a number of new faces on the committee as several regulars are resigning from the committee.

Those retiring are thanked for their hard work and those joining the committee are welcomed. We look forward to an on-going and active Society in every way.

The shack will be opening again in February.

A list of interesting projects and lectures are planned for 2017, alternated with social Saturday mornings. The few problems we had with security last year have been dealt with and various other improvements have been undertaken.

The antenna analyser kits

These are running out the door as usual but some extra helpers could be useful.

73

Christine

Silent Key Eric Simms VK6FEDS

NCRG Members were saddened to hear of the passing of our dear mate Eric Simms on Sat 26 November 2016.

He had been fighting cancer for some months and passed away peacefully at Kalamunda Hospital.

Eric had been a member less than three years; he was a friendly character who won the hearts of members with his wit and cheerful nature.

In earlier days he was a CB operator but later passed the Foundation licence, gaining the call sign VK6FEDS.

We understand he was born in NSW, later moving to Western Australia where he was employed in the North West by BHP as a machine operator and rigger, skills that served him well following his retirement in the construction of both his home station and the work he eagerly undertook at NCRG.

He was not afraid to get stuck into a wide range of jobs, he would let you know in no uncertain manner if he found you doing anything he deemed to be unsafe, and members quickly found out not to feed his faithful German Shepherd any sausages at the Sunday morning gatherings, a good old Aussie bloke who often called a spade a "bloody shovel".

Of special mention is the erection on site of the ex VK6HK tower: Eric helped with the dismantling and transportation to Whiteman Park, he said "This is a magnificent tower, I wish I had one just like this".

Once on site he started digging the footing by hand followed by mixing the concrete, fabricating steel reinforcing etc. and finally standing the tower up.

Much of this work was undertaken by Eric alone during week days when he would come and work when able; we were amazed at the amount of time he put in on the project, he did us proud.

In recognition of the special effort put into this project, the membership recently voted to name the tower the "E" tower, and a suitable plaque has been manufactured and attached to the structure as our tribute to the tireless effort he put into what became "Eric's Tower".

So long old cobber, Rest easy, we'll miss you around NCRG.

73

Wayne Johnson VK6EH

VK3 news Amateur Radio Victoria

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

KRMNPA Merit Awards

Two new Keith Roget Memorial National Parks Award 'Merit' certificates have been issued to Rob Janoska VK4AAC and Marc Hillman VK3OHM. Both of the Hunters have made a dedicated effort to work all 45 VK3 National Parks.

Rob VK4AAC is among those who have now qualified for the Merit Award having heard and worked all 45 Victorian National Parks.

The achievement of all the VK3 National Parks is difficult, but achievable, for those who make the effort and the latest took about two years to do so.

In Rob's case, (while portable in VK5), his first contact was with Mick Geraghty VK3PMG/p in the Grampians NP, and the 45th, while again in VK5, was with Marc VK3OHM/P, who was activating the highly sought after Mt. Eccles NP in Western Victoria.

Marc VK3OHM has now also qualified for the Merit Award having worked all 45 VK3 National Parks. Marc's first contact was with Bernard Kates VK2IB/3, portable in the Mt. Buffalo NP and like Rob, ended in January with Mick VK3PMG/P who, on this occasion, was activating the Port Campbell NP.

Marc VK3OHM operating portable with his squid pole mounted antenna.

The aim of Marc VK3OHM is to qualify for the KRMNPA Grand Slam plaque by both working from, and to, all National Parks - in other words having activated 45 and worked others in 45 parks.

The KRMNPA program rules also include a basic award to VK3 stations who achieve 15 National Parks. Non-VK3 stations need 10, while DX stations require five.

Also during 2017, there is the **Victorian Local Government Award 2017 Challenge** that is attracting interest, with plenty identifying home and portable stations as being in a municipality during the QSO. This special 2017 LGA Challenge operating award is for contact between the 79 Local Government Areas (LGA) in the State of Victoria, during the 2017 calendar year. The KRMNPA and Challenge rules are on the Amateur Radio Victoria website.

Classes prove to be popular

The next quality Foundation licence training sessions are on 22 April, with assessments held the following day 23 April 2017.

The Foundation licence study and operational practice manual is available on mail order for $35 from our shop.

To obtain more detail or enrol contact Barry Robinson VK3PV Education Team Leader *foundation@amateurradio.com.au* or 0428 516 001.

Participate

John Moyle Field Day | 18-19 March 2017

VK2 news

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

Hello. As we move into autumn away from the recent summer heat there was an item on the ARRL web that there are signs of cycle 25. It would be nice to have some good propagation again.

ARNSW have their AGM scheduled for Saturday 29 April 2017 in the Centenary Building at the VK2WI site. There is also the call for committee nominations which close this month on Saturday 18 March 2017 at 11 am at the VK2WI site - advises the Returning Officer. The next ARNSW T&T on Sunday 26 March 2017. There was a production run of ARNSW membership badges at the end of January. The next intake will be towards the end of April. Apply for one via email to *office@arnsw.org.au*

The Education team at ARNSW has advised that there is a high level of inquiry for their bi-monthly Foundation course and assessments which often exceeds the number that can be handled. Inquiries should be emailed to *education@arnsw.org.au*.

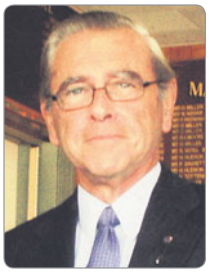
They have also advised that weekends set aside for the courses in both March and May have clashed with major activities and will be rescheduled. Details may be found on the ARNSW web site and in VK2WI News on Sundays. This month the Upgrade course commences at ARNSW on Monday evenings, except public holidays, until November. Apply by email. Also on these nights the ARNSW Library is open from 4 pm to 8 pm. Also on 4 and 5 March 2017, the St. George ARS have a Foundation and assessment weekend. They have more weekends scheduled at three monthly intervals for the rest of 2017.

On Sunday 12 March 2017, the Waverley ARS conducts their Ferrytron event. They also conduct Foundation courses and assessments weekends about every three months. They are one of the older clubs who can trace their origin back to 1919. They are well advanced in planning for their Centenary in 2019.

With the continuing shutdown of HF AM transmissions both locally and across the world there are only a few places left to find this mode on short wave. There are a few Amateur nets like that 7125 kHz on 40 metres, with both old and newly constructed rigs. The VK2WI News on Sundays has AM transmissions on 40 metres (7146 kHz) and 160 metres (1845 kHz). The Engineering team at VK2WI over the New Year period gave their 40 metre AM transmitter, an AWA J54-800, first put to air in the Civil Aviation world in 1951, an extended life by replacing the oil filled power supply capacitors. Maybe they were condensers in those days. Whatever they were, the hum has vanished.

With the 60th annual Central Coast Field Day behind us, one of the next major VK2 field days will be the Oxley Region ARC on the June long weekend in Port Macquarie, at the Light House Beach Surf Club hall.

73
Tim VK2ZTM.



VK3news Geelong Amateur Radio Club

Tony Collis VK3JGC

Photo 1: The annual GARC in the Park at Geelong Eastern Gardens.

GARC in the Park

The now established annual Christmas break up celebration dinner took place at the Rotunda in Eastern Gardens Geelong, with over 40 club members and partners attending; the weather was bright but cold. However, that did not dampen the spirit of the occasion.

Vanessa VK3FUNY and Courtney VK3FGIR with assistance from President Chris VK3ACG acted as chef's, cooking chicken, sausages and hamburgers with cold drinks provided by the Club; plenty of other food was provided by those attending the event.

Towards the end of the evening Jenny VK3FJEN conducted a raffle for those present and finally President Chris VK3ACG gave a round up speech on the Club's activities and high lights during 2016 and some projections for what is in planned for 2017.

Photo 2: Enjoying the Solstice Dinner and company.

Photo 3: President Chris VK3ACG.

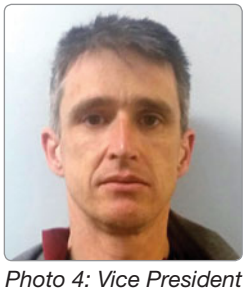


Photo 4: Vice President George VK3AGL.

Changing Roles within the GARC Executive

Introducing the new President Chris VK3ACG, replacing Lou VK3ALB and Vice President George VK3AGL, replacing Tony VK3JGC.

73

Tony VK3JGC

WIA 2017 AGM and Weekend of Activities – Hahndorf

Grant Willis VK5GR

This year, with the WIA AGM and Convention being held in the Adelaide Hills, the affiliated radio clubs in South Australia have come together to produce the program for the weekend outside of the AGM on Saturday morning. Details of the social events and partners program have already been released, and we have now put the finishing touches on the speakers program as well. If the AGM isn't enough of a reason to come along, then perhaps hearing from these leading experts in their respective fields of Amateur Radio will entice you to come and sample the delights South Australia has to offer.

The Magic of Amateur Radio

The radio clubs of South Australia wish to invite you to take a journey of discovery into the future of the Amateur Service in Australia. We wish to showcase the Amateur Service in a new light, giving you an introduction to a range of advanced modes, fresh activities, and new technologies and hopefully leave you with a new perspective on what Amateur Radio can be. We also want to remind you of why we are participants in this fantastic hobby, after the 'business' aspect of the event is concluded.

Prior to the lunch break you will hear from Doc (David Wescombe-Down) VK5BUG who will introduce a new manual he has prepared on operating on the low bands. This useful publication is very timely, considering the phase of the sunspot cycle we find ourselves in and the heightened relevance low band MF and HF operation will have to the Amateur Service over the next few years.

After lunch, it will be time to take your seats for a journey through some of the best that Amateur Radio has to offer. We want to rekindle the "Magic of Radio" in you all and leave you, if not with a new interest, at least with an appreciation of what is out there, so that you can talk about it with people you meet who show any spark of interest in the hobby. With these aims in mind, we have brought together some of the best practitioners of the Amateur Radio art in their fields, to showcase their expertise and give you a glimpse of what is possible.

So that no one misses out, the day will take on a new form. Don't expect the traditional technical symposium style event. This will be something new! You will be treated to a lively introduction to these facets of the hobby and afterwards be given a chance both on the Saturday and again on Sunday to sit down with the experts and learn much more about your chosen area in detail.

Guest speakers

David Minchin VK5KK and Iain Crawford VK5ZD

Introducing Amateur Microwaves – David and Iain have both been active in amateur microwave communications for many years now, and regularly participate in the microwave contests. With equipment up to 76 GHz their experiments have been extensive, going as far as undertaking DXpeditions into the European Alps to ply their microwave trade. They hope to inspire you to come and try microwave communications and will conduct a live demonstration to whet your appetite. David will also talk about his 10 GHz portable EME setup. While Saturday will provide an introduction, Sunday afternoon will give you an opportunity to get up close to their equipment and ask lots of questions about how you can get involved too in this fascinating aspect of the hobby. It is planned to activate 10 GHz EME portable as well at the come and try event on Sunday.

David Carwana VK5DMC

Getting into Digital Amateur Television – David was the pioneer of digital ATV in South Australia's Mid North, bringing a group of enthusiasts together to construct the VK5RDC digital ATV repeater, based on the ranges behind Port Pirie. David will show you how easy it is to start receiving digital ATV, give some insights as to what was involved in the repeater's construction and most importantly show you the path towards transmitting your own ATV pictures.

Paul Simmonds VK5PAS

Operating Field portable in the great outdoors – Paul has been inspirational in encouraging local amateur radio operators onto the air, either in the field or back at base through the creation of the VK5 Parks Award. Paul is well-known for promoting and supporting the popular portable activities such as the VK5 Parks Award, World Wide Flora and Fauna (promoting conservation via Amateur Radio). Paul will take you through the steps of creating your own parks portable station and hopefully inspire you to get into the great outdoors! On Sunday, Paul will lead one of the "expedition teams" out into the field in a Come and Try Parks portable event, somewhere in the picturesque Adelaide Hills.

Steve Adler VK5SFA

Operating Low Band HF in confined spaces – Steve has a love of low band HF, amongst many other things. The size of antennas on low band frequencies, and the man-made noise problems encountered in your typical suburban block usually make operating 160m and 80m difficult at best. Steve was looking for an alternative when he consulted with Lee Turner VK5KLT and Paul Lawson VK5SL.

Together, they offered advice on how to refine Steve's design for a Transmitting Magnetic Loop Antenna, which solved the size and noise issues perfectly. Steve will discuss the antenna he has built and how he has used it to work 160 m & 80 m DX on an antenna only 3 metres in diameter and only 1.8 metres above the ground!

Steve will also show and demonstrate his 60 m-30 m loop antenna, ideal for when VK Amateurs are finally granted access to the 60 m band.

Mark Jessop VK5QI

High Altitude Balloon Tracking – Mark will update you on what has been happening in the Project Horus High Altitude Balloon project since the Mildura AGM, with a particular focus on the new SSDV live imaging payload system he has developed nicknamed 'Wenet – The Swift one'. This payload, with its 115 kbit/s downlink, is now sending pictures from the balloon mid-flight. Mark will show everyone the very simple technology that you can use to download the images yourself, as well as describe the other ways you can track the balloons from home. Tentatively on Sunday a balloon launch is being planned – details closer to the day.

David Rowe VK5DGR *(of FreeDV fame)*

SSB had been the dominant voice mode for 50 years for good reason. David is on a mission to replace SSB, by developing the FreeDV series of digital voice modes for HF. During this talk, David will discuss the latest developments in FreeDV and how well it competes with SSB. He will show how you can get up and running with FreeDV and experiment with the new mode yourself.

Julie VK3FOWL and Joe VK3YSP

Promoting Amateur Radio – where to start – Joe and Julie are well known in Victoria for their work with their School Amateur Radio Club project. They will share a précis of their activities and demonstrate the sorts of things they have been doing with school children that have left a lasting positive impression of Amateur Radio on the younger generation.

STEM Practitioners

How we can all get involved in promoting Amateur Radio – Q&A Session with STEM practitioners, Maker Movement Representatives, Hacker Spaces, Science Teachers and more. Following on from the STEM symposium held in Canberra, Grant VK5GR and Matt VK5ZM will introduce local STEM identities and provide the opportunity for a panel discussion on how amateur radio can contribute to the STEM movement in education.

Saturday Evening – Keynote Speaker – Islands on the Air

Keynote Speaker - Craig Edwards VK5CE

The Radio Clubs of South Australia have invited Craig Edwards VK5CE to come and speak about the Islands on the Air program. Craig, who is a prolific island activator and one of the leading advocates of the IOTA program in Australia, will introduce this fantastic aspect of the hobby giving both the practical and humorous side of what it takes to stage a DXpedition on a remote island. Rest assured there are tales to be told and stories to be had from Craig's many adventures. It promises to be an entertaining yet informative look at this extreme site of Amateur Radio.

Sunday Morning - National Motor Museum at Birdwood

On Sunday morning we will be visiting the National Motor Museum at Birdwood.

Since 1965 millions of people have enjoyed discovering their motoring heritage and the social history of motoring at the National Motor Museum, Birdwood, South Australia. As an international centre for the collection, research, preservation, education and display of Australian road transport history, the National Motor Museum is much more than a collection of vehicles. It is a social history of the way we were, the way we are now and the way of the future.

We encourage car-pooling to assist those without transport to attend the Birdwood motor museum activity.

Sunday Afternoon Program – Hahndorf Oval

Following on from the introductions to the many facets of Amateur Radio on Saturday, Sunday afternoon will see everyone treated to hands on demonstrations of many of the activities that were presented. Starting from ~1.00 pm, events will run continuously from Hahndorf Oval.

This will be your best chance to get up close and personal with these new modes, equipment and activities. It will give you the opportunity to discuss and learn about these various facets of amateur radio, one on one with the presenters.

Live demonstrations being planned include:

- Microwave equipment Demonstrations and equipment
- ATV demonstrations and Experiments
- Low Band TMLA Antenna Demonstrations
- How to track the Horus balloons using cheap equipment – will include a launch and tracking exercise
- FreeDV HF Digital Voice demonstrations
- National Parks Portable activations – mustering point.

The National Parks portable operation activity will meet first at Hahndorf Oval before those interested will break into teams and have the opportunity to travel with some local activators to nearby parks in the Mt Lofty ranges.

More details about times and locations for this will be released closer to the day.

For those who want something more sedate, you can always explore the township of Hahndorf and all of the cultural and gastronomic delights that this fantastic region of the Adelaide Hills has to offer.

We look forward to you all visiting South Australia and can't wait to see you! Please ensure you register early so that preparations can be finalised.

AR magazine Media Sales

The WIA is seeking a passionate, motivated and energetic volunteer to assist with the sales and management of advertising space in *Amateur Radio* (*AR*) magazine.

THE ROLE

This is a consultative and relationship-focussed role, reporting to the WIA Communication Committee leader and being a member of the Publications Committee.

THE CANDIDATE

The ideal candidate would be a marketing manager or salesperson with experience in print and media sales. The role is focused on prospecting, cold calling, presenting, negotiating, selling advertising space with new *AR* clients as well as maintaining the relationships with existing advertisers. The successful candidate will manage advertisement bookings, ensure the supply of appropriate artwork to the WIA's magazine production company, provide invoicing details to the WIA National Office, and follow up client payments as required.

EXPERIENCE

The ideal candidate would possess:

- 5+ years' sales experience.
- Ideally having worked in the print and media sales industry (past or present) or have had experience working for a company where the role and responsibilities included marketing and advertising.
- A good track record of securing new business and achieving sales targets.
- Outstanding business acumen.
- Excellent presentation and communication (both written and verbal).

All applicants should have read and agree with the draft WIA Volunteer Charter.

To apply please send your resume via email by the closing date of March 31 to: *president@wia.org.au*

WIA news

Consultation Policy provides specific ways and means for all to comment

Noting an expressed desire among some members and others in the Amateur Radio community for a formal process for the WIA to encourage consultation on issues affecting Amateur Radio, the WIA Board has formalised a policy and processes for this in its Consultation Policy, which is now available for download.

Despite the fact that various means for members and others have always been available to send comments and feedback to Institute – and these are used daily – the advent of specific online 'Have Your Say' facilities by government agencies at national, state and local levels, as well as unions, professional societies and other non-government organisations, has given rise to a general expectation that such a specific facility be instituted by organisations generally.

The principal objective is that all WIA members, and the amateur radio community generally, have the opportunity to provide views and comments to the WIA on identified matters or issues of interest or importance via the means of a specific online channel, with secondary channels via traditional means of email, fax and post.

You can download the WIA Consultation Policy from the WIA website.

Assessment and licensing matters

Fred Swainston VK3DAC

The WIA Exam Service has, since 2006, been processing assessments, making callsign recommendations and liaising with ACMA which issues the licences.

The WIA administers all Amateur Radio assessments under an agreement with the Australian Communications and Media Authority (ACMA).

Since doing the assessments, there have been 5504 Foundation licence assessments for theory and about same number of assessments for practical.

These exams require a written radio theory and regulations paper of 25 questions and a 70% pass mark and a practical assessment requiring 100%.

On top of those are assessments for the Standard and Advance licences that can be a 50 question Theory paper, Regulations paper, and if needed a Practical test.

The WIA Exam Service handles assessment packs requested through a network of trained and accredited assessors, with about 70 radio clubs running training courses for the Foundation Licence.

An average of 1200 exam packs are ordered a year and in 2016 there were 1,146 callsigns recommended.

The WIA pays credit to the dedicated network of volunteers, with 24 Nominated Assessors, 217 Assessors in all States and Territories and 48 Learning Facilitators.

2016 statistics on packs ordered

AOCP **Foundation/Standard/Advanced** - Practical only	203
AOCP **Foundation** - Theory/Regulations combined	449
AOCP **Standard** - Theory only	144
AOCP **Standard/Advanced** - Regulations only	213
AOCP **Advanced** - Theory only	178
AOCP **Foundation/Standard/Advanced** - REMOTE Practical only	3
AOCP **Foundation** - REMOTE Theory/Regulations combined	3
AOCP **Standard** - REMOTE Theory only	3
AOCP **Standard/Advanced** - REMOTE Regulations only	3
AOCP **Advanced** - REMOTE Theory only	1
TOTAL	**1200**

Remote and special assessments provided

Remote assessments are for candidates that are more than two hour's travel from an assessment centre while special assessments are for candidates who have special needs to complete the assessment.

Under a Deed of agreement with the ACMA the WIA needs to recover its costs and report on its performance twice yearly to ACMA in December and June.

Exams

2006	1348
2007	1405
2008	1228
2009	1887
2010	1581
2011	1445
2012	1175
2013	1356
2014	1272
2015	1356
2016	1179
Total Assessments	**15232**

Average 1384 per year

Callsigns

2009	738
2010	1178
2011	1116
2012	982
2013	1062
2014	1054
2015	1061
2016	1146
Total Callsigns Processed	**8337**

Average 1042 per year

TAC Notes

John Martin VK3KM

HF bands Digital segments

The feedback received has been favourable to the proposed band plan changes that would bring our band plan digimode segments into line with the plans applying in the three IARU regions. So it is proposed now to go ahead with making these changes.

30 metre band - SSB segment

The options for the 30 metre band are far more controversial. Many CW operators would prefer the SSB segment to be reduced or removed altogether and the band used only for narrow band modes. But SSB operators can point out that SSB is fully legal on 30 metres, it is the most popular and accessible mode used by amateurs, and it has been coexisting with the narrower modes for many years.

We need a compromise that everyone may be prepared to accept even if it is not the outcome that they would have preferred. So the following ideas are offered:

1. It would be helpful to CW operators if various net frequencies between 10.116 and around 10.122 MHz could be kept clear of SSB operation.
2. There are several long established SSB net frequencies from around 10.125 MHz up. These should be left untouched.
3. At the top end of the band, the digital modes segment is to be expanded down to 10.130 MHz, to bring it into line with the band plans in all three IARU regions. Digital activity is increasing and more spectrum will be needed as time goes by. However the peak time for digital activity is after dark. Sharing with SSB is a practical proposition if SSB activity is curtailed after dark, at the time when international digital activity begins to increase.

These considerations add up to a possible compromise plan as follows:

1. Recommend that where possible, SSB only be used on 30 metres during the hours of daylight.
2. Move the lower recommended limit of the SSB segment up to 10.125 MHz, thus clearing the CW activity that exists between 10.116 - 10.122 MHz.
3. Allow SSB and digital sharing up to 10.135 MHz.

Therefore, the SSB segment would overlap the CW segment by 5 kHz, and at the other end, it would overlap the digital segment by 5 kHz. The overlap could be greater during daylight hours, but SSB should be used as little as possible after dark.

This may not be everybody's preferred outcome, but is a compromise that may hopefully be acceptable to the majority of amateurs. I suggest that we give it a try. But if it does not receive reasonable support, the status quo remains. But nothing is set in stone, and the plan can be reviewed again as necessary.

Remote imaging

Rod Green VK3AYQ

What is “remote imaging”?

In this case it is the reception and display of images of the Earth that are transmitted from satellites either orbiting or geostationary. My interest in this subject started around 1970 and while not strictly amateur radio, some technical expertise is required to achieve good results. I will outline my journey over the years and then give a description of “how to” for those who might want to try this interesting project for themselves.

I first read about the subject in a QST magazine. At that time, display of the images was done by photographing a CRO screen or by using a facsimile machine. I was lucky enough to be put in contact with Bill Rice VK3ABP (SK) and he gave me a demonstration of his home brew facsimile machine.

I went home all enthusiastic and built a machine of my own.

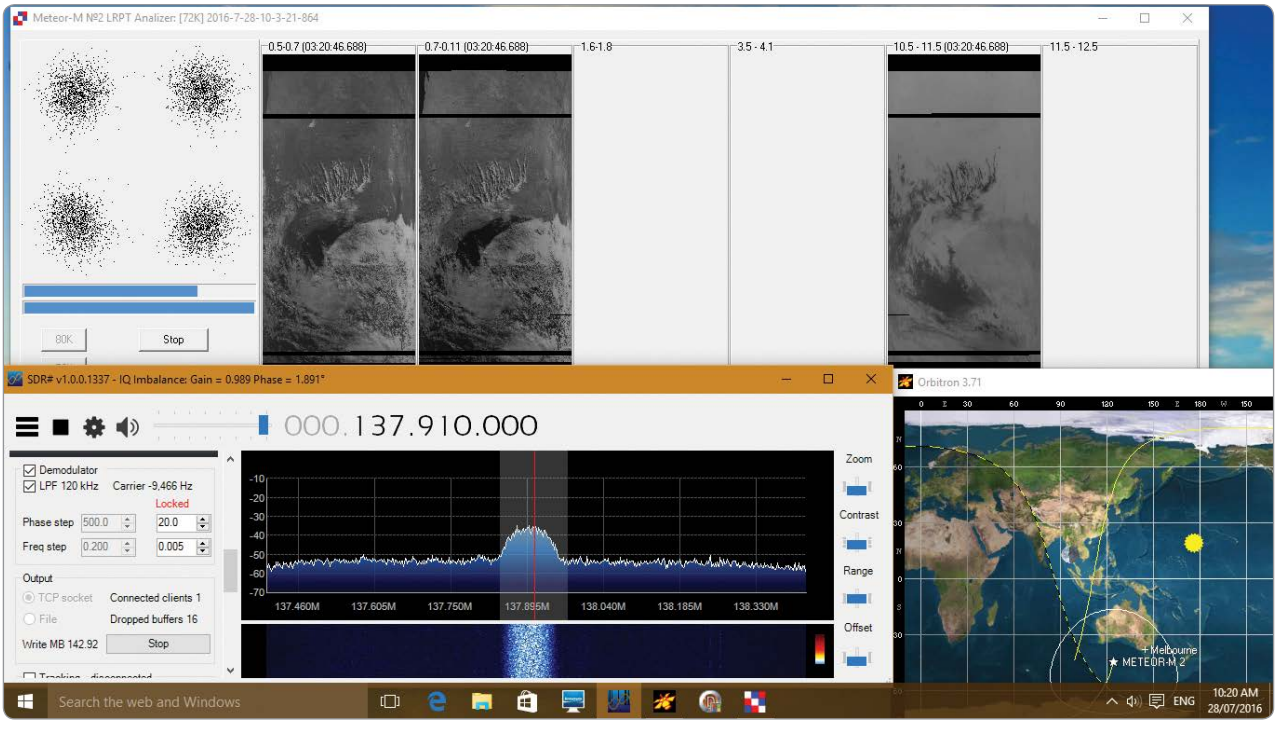
Well, it turned out to be an absolute disaster, simply because I did not have the necessary knowledge in electronics or engineering to complete such a project. At the time I could receive the satellite signals noise free using a valve converter and valve receiver. But, as mentioned, display of the images was beyond my capabilities at the time. So the project was discontinued until about 10 years later.

Personal computers were beginning to appear and I bought a Commodore 64 computer. Software was available for weather satellite decoding and using a commercial scanner receiver on 137 MHz and the computer I at last was able to display the images. The detail was not great because the images were only in four shades of grey. However it was a start.

The next step was the purchase of a second hand laptop running Windows 3.1. Using the software program JVFAX, excellent images were obtained in 256 levels of grey. The commercial scanning receiver was followed by a dedicated satellite receiver for the 137 MHz satellite band. This was built from a kit supplied by MiniKits in South Australia. By now the JVFAX program had been replaced with “WXSat” (1).

This program allowed the decoding of both the visible and infrared images transmitted by the NOAA series of satellites. It also had provision for the decoding of

Photo 1: Screenshot of computer during reception.



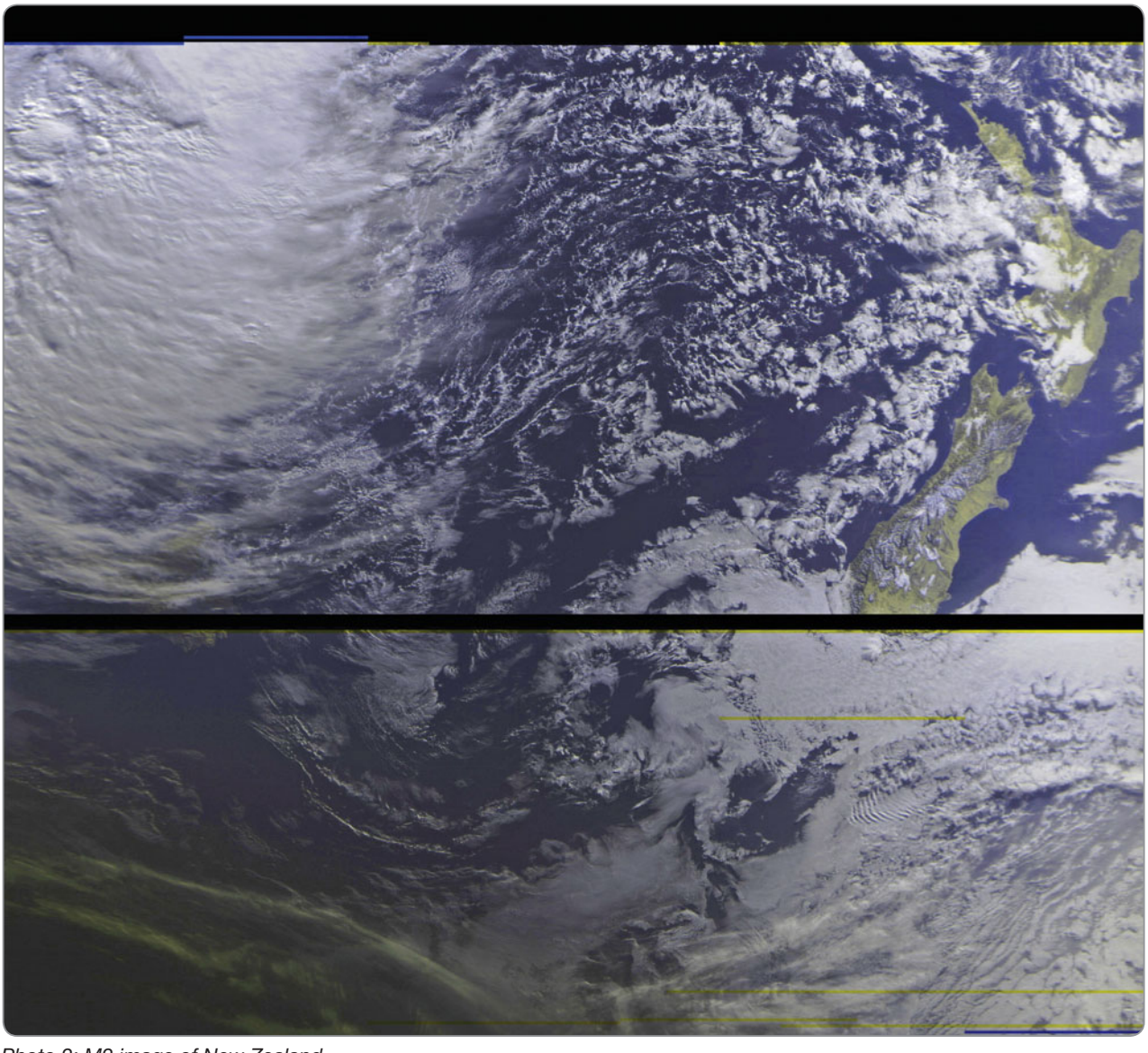


Photo 2: M2 image of New Zealand.

the "Wefax" images transmitted by the Japanese satellite MTsat which transmitted images on the hour on 1691 MHz. I did build a receiver for Wefax reception and results were excellent, but unfortunately these analogue transmissions were replaced with digital transmissions that I could not decode.

The next receiver was a dongle or software defined radio. It was purchased from NooElec in America and the model was NESDR Mini2. This is the receiver that I am using now.

Traditionally orbiting satellites have transmitted pictures of the Earth in the 137-138 MHz band. These low resolution pictures are derived from higher resolution pictures which are transmitted around 1.7 GHz in digital format. On 137 MHz the transmission is analogue and the parameters have changed little over the years. A scanner on board the satellite scans the Earth at 360 lines per minute. On 137 MHz images are transmitted at 240 lines per minute and each line alternates between visible and infrared. These images are monochrome but by combining them using software, a colour image can be created. Equipment for 137 MHz is a RHCP antenna such as a turnstile or quadrifilar helix antenna, an LNA and a suitable FM receiver with an IF bandwidth of 35 to 40 kHz. Software for decoding can be WXtoImg (2) which can be downloaded free on the net. There are three NOAA satellites currently in use but be aware that these satellites are all past their use by date.

There are also two Russian satellites in orbit Meteor M1 and M2 one of which is normally

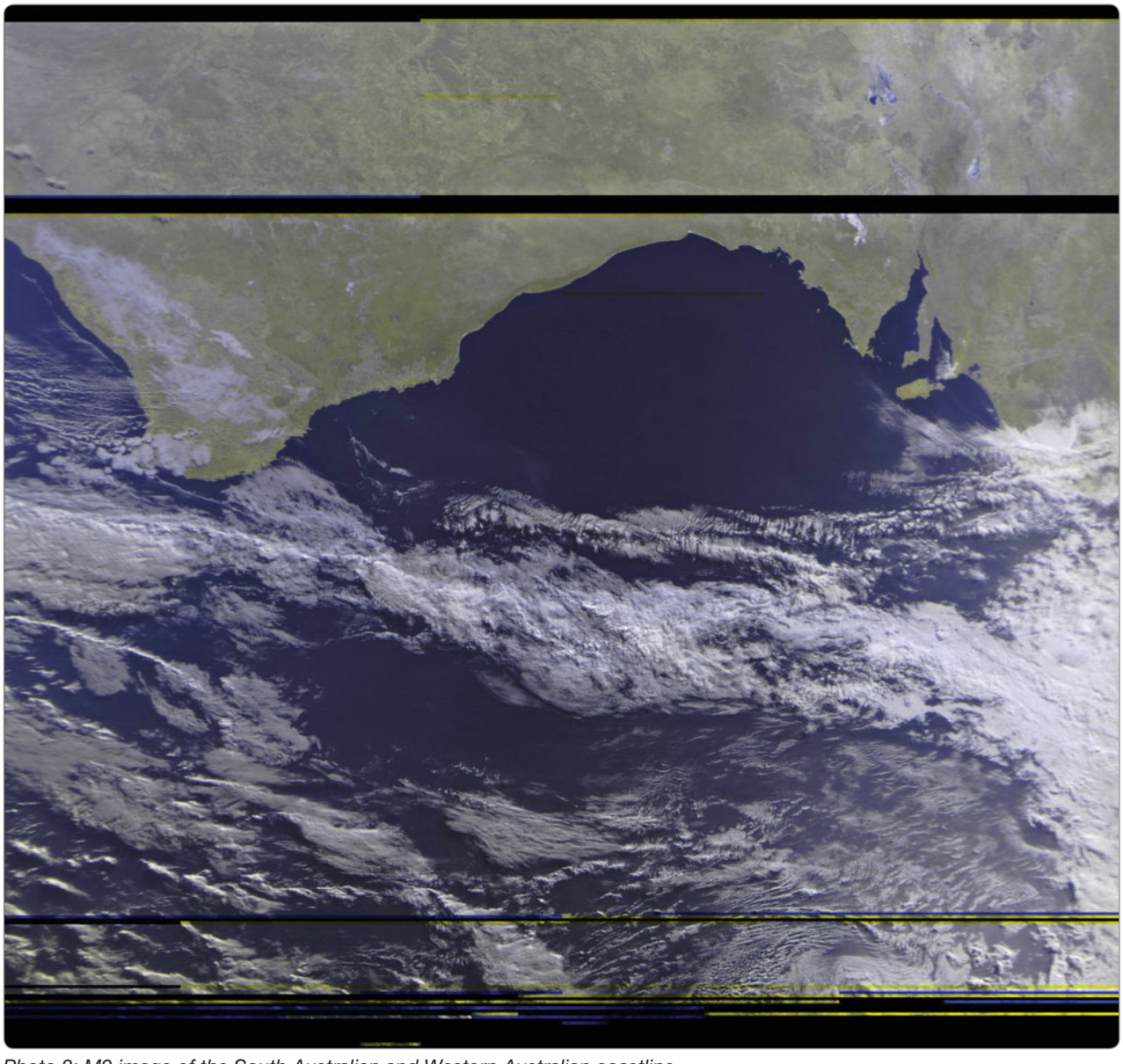


Photo 3: M2 image of the South Australian and Western Australian coastline.

transmitting in the 137 MHz band. The difference between these and the NOAA satellites is that the pictures have 12 times more resolution and are transmitted in a digital format with images in three spectral bandwidths transmitted simultaneously. This is called Low Rate Picture Transmission or LRPT. You still need the antenna and LNA, BUT, the Rx needs to have at least 100 kHz bandwidth to accept the QPSK modulation. The easiest way for reception is to use a "dongle" or, to put it simply, a "Software Defined Radio". Software for reception can be found on the net, but possibly the best program is SDR# with a QPSK plugin. This software can be found at the site of IZ5RZR (3) and is already set up for reception and decoding of the signal. By using the software program "LRPT Image Processor" (4) further enhancements can be made to the image. The original images are obtained with a 'fisheye" lens. Edge compression can be removed, and images such as false colour, infrared, thermal and vegetation can be displayed.

As can be seen in the attached photo, I run three programs simultaneously to decode the received signal. In the bottom right is the tracking program Orbitron (5) to see where the satellite is. On the bottom left is SDR# and the spectrum display shows the 100 kHz signal in the centre of the screen. Also on the left of this the demodulator is shown as being in lock. The program at the top is the LRPT decoding program. On the top left of this is a constellation

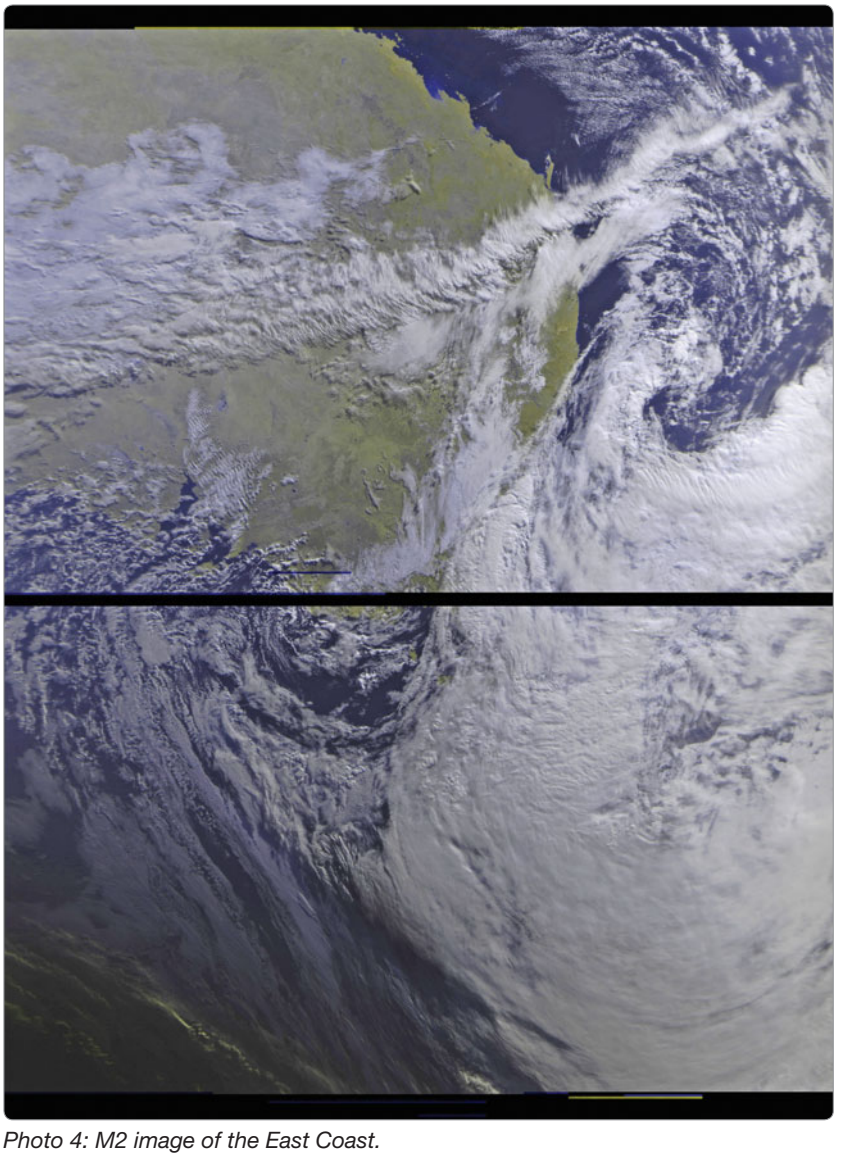


Photo 4: M2 image of the East Coast.

diagram. This shows 4 dots which show that the demodulator is in lock. The smaller these dots are the stronger the signal. If the constellation diagram shows a square or cross then the received signal is not of the correct data rate for the decoder. Three monochrome images are seen which are in differing spectral bandwidths.

Our weather is in a constant state of change. The cloud formations are constantly changing so from day to day no two images are the same. I marvel at the natural beauty of these formations. Also, looking at the ground from above, it is interesting to pick out landmarks. Particularly interesting is to increase the magnification of an image and look at the rugged coastline of say Tasmania or inland areas in farming regions.

Satellite M1 has a weaker signal strength compared to M2, which is possibly due to the VHF antenna not deploying properly. Satellite M2 has a software reset every 6½ minutes which shows up as a black line across the picture. Transmission frequencies for these satellites are either 137.1 MHz or 137.91 MHz

The above is a very brief overview of what is a large and interesting subject. If readers have any queries please feel free to email me at *vk3ayq@bigpond.com*.

References

1. Google search WXSat-HF-FAX
2. *www.satsignal.eu* or *www.wxtoimg.com*
3. Google search *sdrsharp qpsk iz5rzrz*
4. *www.satsignal.eu* or *www.wxtoimg.com*
5. *www.stoff.pl*

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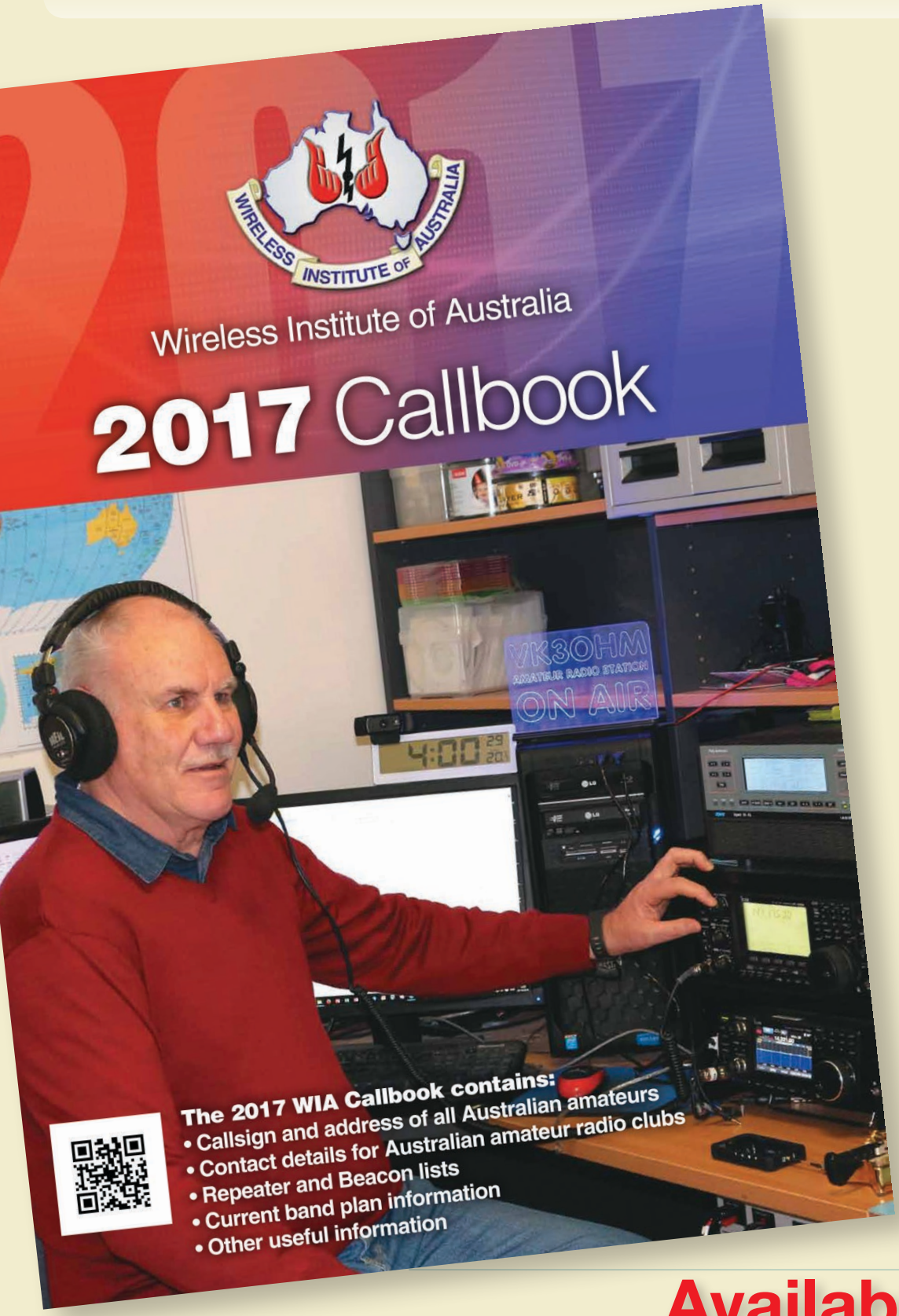

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