Amateur Radio

Volume 84
Number 9
September 2016
Price: $9.70 incl GST
www.wia.org.au

- HF Digital Voice
- Using eQSL
- Using centre-off switches

VHF/UHF Field Days

Winter Field Day Results

ISSN 0002-6859

FT2DR

144/430 MHz DUAL BAND DIGITAL TRANSCEIVER

Advanced C4FM Technology Opens up New Vistas for Amateur Radio

- C4FM Digital with FM Friendly AMS
- Advanced Touch Panel Operation
- Huge 43.2 × 43.2mm Full-dot Matrix Display
- Snapshot Image Display
- Simultaneous C4FM/C4FM standby
- New Digital Features

YAESU
The radio

YAESU Authorized Dealer

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

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

YAESU Authorized Service Center

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

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

Volume 84
Number 9
September 2016
ISSN 0002-6859

Amateur Radio

The Journal of the Wireless Institute of Australia

Editorial

Editor
Peter Freeman VK3PF
editor@wia.org.au

Technical Editor
Peter Gibson VK3AZL

Publications Committee
Peter Hartfield VK3PH (Callbook Editor)
Ewen Templeton VK3OW
Kaye Wright VK3PKDW (Secretary)
WIA Office Bruce Deefholts VK3FBLD

All circulation matters
nationaloffice@wia.org.au

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

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

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

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

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

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

Columns

Technical

General

This month's cover

Part of the EMDRC team for the VHF/UHF Filed Day, with some of the impressive array of antennas deployed for the Contest. L to R Mike VK3AV, Peter VK3QI and Jack VK3WWW. Read about the VHF/UHF Contests in this month's Contest column. The results of the Winter Field Day are also published in this issue. Photo by Andrew Scott VK3BQ

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are welcome and will be considered for publication. Articles attached to email are especially welcome. The WIA cannot be responsible for loss or damage to any material. Information on house style is available from the Editor.

Back Issues
Back issues are available directly from the WIA National Office (until stocks are exhausted), at $8.00 each (including postage within Australia) to members.
Photostat copies
If back issues are unavailable, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).
Disclaimer
The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

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

Wireless Institute of Australia

ABN 56 004 920 745

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

Representing

The Australian Amateur Radio Service

Member of the International Amateur Radio Union

Registered Office of the WIA

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

All mail to

PO Box 2042 BAYSWATER VIC 3153

Business hours: 10am 4pm weekdays

National Office

Executive Administrator	Bruce Deefholts	VK3FBLD

Board of Directors

President	Phil Wait	VK2ASD
Vice-President	Fred Swainston	VK3DAC
Directors	Robert Broomhead	VK3DN
	Roger Harrison	VK2ZRH
	Ewan McLeod	VK4ERM
	Paul Simmonds	VK5PAS
	Andrew Smith	VK6AS
Secretary	Jim Linton	VK3PC
Treasurer	TBA	

Coordinators

AMSAT	Paul Paradigm	VK2TXT
ARDF	Jack Bramham	VK3WWW
Australian ARISS	Shane Lynd	VK4KH
Awards	TBA	
Clubs	Ted Thrift	VK2ARA
Contests	Craig Edwards	VK8PDX
John Moyle Field Day	Denis Johnstone	VK4AE
Editor 'AR	Peter Freeman	VK3PF
EMC/EMR	Gilbert Hughes	VK1GH
Standards	Phil Wait	VK2ASD
	Ron Cook	VK3APW
	Noel Higgins	VK3NH
NTAC	John Martin	VK3KM
Historian	Peter Wolfenden	VK3RV
IARU Region 3 Liaison	Jim Linton	VK3PC
Monitoring Service	Peter Young	VK3MV
ITU Conference & Study Group		
	Brett Dawson	VK2CBD
	Dale Hughes	VK1DSH
QSL Curator	National Office	
Repeater	Peter Mill	VK3ZPP
	Andrew Chapman	VK4CF
Webpage	Robert Broomhead	VK3DN

Editorial

Peter Freeman VK3PF

Another change of seasons

As this issue arrives in mail boxes, spring will almost be with us: another change of seasons.

This Editorial was written shortly after the VK1 SOTA Winter QSO Party in early August. At least in Victoria, the weather was relatively mild. Some intrepid operators headed for some of the higher summits. Whilst the terrestrial weather was relatively benign for time of year, the space weather was not really cooperating.

It is clear that we are moving toward the trough that follows the peak of solar activity. But even the space weather professionals are not sure regarding the likely conditions in coming months and years.

For those like myself that chase SOTA and Park contacts, we often see that conditions on the 40 m band are not cooperative. Especially early in the day, we are seeing a distinct lack of short haul NVIS propagation. Sometimes, the conditions persevere for most of the day. Luckily, some longer distance contacts can be made, thus ensuring that the intrepid SOTA Activator can gain the required contacts to qualify the summit. For the Chaser, it can be frustrating: you can hear the further away stations making contact, but cannot yourself hear the Activator.

On top of these variable conditions, some are suggesting that there is evidence that the northern and southern solar hemispheres may be interacting in an unusual manner. Few are predicting the results – we will need to wait!

Some of the SOTA Activators are trying out 80 m, often until well into the daylight hours, with some success. So they are making some of the contacts on 80 m that would normally be expected to be made on 40 m at times when nothing can be heard on 40 m.

Regardless of the space weather, the longer days and milder weather are likely to tempt more Activators to make trips out into the great outdoors.

On top of the improving weather, many new Parks have been added to the VKFF list of References, notably in VK2, 4 and 5 at this time. With new Parks to activate, many of the Activators are finding new Parks to visit relatively close to home. The Chasers are keen to work new references, so small dogpiles are often the result.

All of the Activators are happy to work anyone who calls, so keep listening and join in the fun. This is especially true of those activating a Park for VKFF/WWFF: they need to work 44 different callsigns to qualify the Reference for WWFF, which can be hard work in Australia with its lower number of active amateur operators in comparison to Europe.

A small blunder

Last month, I quoted a phrase in my Editorial: *Anchora Imparo*. I stated that it was Latin – I made an error. It is actually Italian – my apologies. Wikipedia tells us that the phrase is often incorrectly attributed to Michelangelo. Attribution is not important in the context that I used the phrase, but I do feel that the meaning – I am still learning – should be of importance to all amateurs.

Until next month,

Cheers,

Peter VK3PF

WIA comment

Phil Wait VK2ASD

Dollars in, dollars out

In this President's Comment, I'm going to resort to some "bucket economics" to explain where I see the WIA is heading.

As was the agreement when he took the role in January, our paid Treasurer, Murray Leadbeater CPA, finished up at the end of the financial year to attend to the needs of his many other clients. Murray is still available to us as required, but by the time this magazine is distributed we will be looking in earnest for a new WIA Treasurer with appropriate qualifications.

So, I have been spending some time recently looking at the financial position of the WIA, and I thought I'd share some observations.

The vast majority of the WIA's income comes from membership fees. However, membership numbers are down from 4487 at the end of last year to 4246 at early August this year, representing a reduction in membership income of about 5%, or in dollar terms, about $20,000 for this year. These figures come from the monthly Memnet membership reports.

I think it is fair to say that the WIA membership is fragile around the edges, and there continues to be quite a lot of churn. Some membership reduction is expected as the total amateur population declines in numbers due to age, but the negative publicity on social media recently certainly hasn't helped, and it is interesting to note that the fall is greater than that experienced after the last membership fee increase.

At 10th August 2015 the WIA was trading at a loss of $27,184, and finished the year with a balance sheet loss of $12,608. As at the 10th August this year, we are trading about $5,500 behind the same time last year, but with the reprinting of the Foundation Licence manual, contractor expenses in the first month of the year and, until recently, the costs of a paid Treasurer, that result is not unexpected. Financial questions received by the Board at the AGM this year, and in other correspondence during the year, were referred to the Treasurer and the Auditor, generating unanticipated costs of at least $4,000.

On the positive side, the cost of the AGM and Conference weekend this year, including very minimal Directors' travel and accommodation, was much lower than last year, and we are now holding a stock of 4689 Foundation Licence Manuals which is a perennial money spinner for the WIA.

Outlook

Let's be blunt. Managing a business in a period of decline is a very difficult thing to do successfully. At every turn there is an expense that needs to be cut, or an expectation for a service that can't be delivered. We need to make savings at the WIA, but we also need to find more and different ways to make money and be less reliant on membership fees.

In recent years the WIA has made a loss on the examinations and callsign work it performs on behalf of the Commonwealth, largely due to increases in insurance, salary and postage costs. Last year was no different, with a small loss to the WIA of about $2,000. Those losses have been absorbed in the past in order to keep examination and callsign fees low and to encourage new people to become radio amateurs (call it a marketing cost), but small losses add up and there is a limit to how much members should cross-subsidise these services.

The greatest single expense, next to employment expenses, is the publication and distribution of *AR* magazine, with the cost very roughly equally split between production, printing, and postage. On a show of hands at the Open Forum in Norfolk Island, 40% of those present indicated they preferred the website download version of *AR* magazine, and that they do not read, or want, the paper copy. In the real-world, if only 20% of members chose to opt-out of receiving the paper magazine without any membership fee reduction, the saving to the WIA on postage alone would be about $14,000 per year. Owing to the scale economics of the printing industry, to achieve significant savings on printing, a much larger number of members would need to choose to opt-out of paper, but $14,000 per year is still a significant saving.

The middle of the year is a difficult financial period every year for the WIA because, for one reason or another, the majority of income comes in the second half of each year. The positive news is that we have a large stock holding of Foundation Licence Manuals, which is a steady seller, and no unusual costs on the horizon. Last year, the

Continued on page 5

WIA news

WIA submission for allocation at 70 MHz

The WIA has lodged a submission with the Australian Communications and Media Authority (ACMA) concerning interest in an amateur allocation in the 70 MHz band.

On 22 June 2016, the Australian Communications and Media Authority (ACMA) opened consultation on proposed updates to frequency plans for the 70.0-87.5 MHz and 148-174 MHz VHF bands, with a closing date of 1 August 2016.

You get little time to respond to government consultations these days. The ACMA is proposing to update its Radiocommunications Assignment and Licensing Instruction document, which covers these VHF bands, known as RALI MS 42.

As the WIA had signified interest in a 70 MHz amateur allocation to the ACMA back in July 2014, the Spectrum Strategy Committee decided that a submission to this consultation was in order, principally to flag the amateur radio community's interest. Historically, the 70.0-87.5 MHz band has been used by commercial, community, government and defence communications services. However, the WIA has been aware for some time that interest in, and use of, 70.0-70.5 MHz has declined across Australia. There is also a Low Interference Potential (LIPD) band at 70–70.24375 MHz, with a maximum permitted power of 100 mW.

The WIA is pitching for use of an amateur allocation between 70 and 70.5 MHz that aligns with allocations across Region 1, which covers Europe, Russia, the Mediterranean, Middle East and Africa. These Region 1 allocations are widely known as the four metre band. The band 69.9 MHz – 70.5 MHz is listed in the "European Table of Frequency Allocations and Applications" as a secondary amateur allocation.

It remains to be seen whether the ACMA's consultation round on RALI MS 42 will flush out renewed interest from other stakeholders. Whatever changes the ACMA decides to make to the RALI, there's another step to go, with consultation on updating the Australian Radio Frequency Spectrum Plan (ARSP) to commence shortly. The ACMA reviews and revises the ARSP after each World Radiocommunications Conference. The last one was WRC-15, which concluded at the end of November last year.

The WIA submission to the ACMA's consultation on RALI MS 42 can be viewed on the WIA website.

ACMA computer system issues affecting licence issuing and renewals

As some licensees have discovered, there has been a problem recently with the ACMA's online licensing database not showing that a licence was current after a renewal or new licence payment had been made.

The WIA has had discussions with the ACMA over the past week concerning this issue. Late on Friday, 29 July, the Licence Issue & Allocation Section of the ACMA provided the following statement:

"The ACMA is currently experiencing an issue with our finance system that is affecting the issue and renewal of some licences. The issue occurs where an invoice, either a request for payment or a renewal notice, was issued last financial year but has been paid this financial year.

"Clients who have paid their invoices on or before the payment due date can consider their licences to be issued and may commence operation. This includes payments for the renewal of licences.

"We are working with our provider to address this issue. Until the issue is resolved, data on the Register of Radiocommunications Licences will be inaccurate.

"The ACMA suggests call sign recommendations cease until this problem is resolved as there is a risk that duplicate call signs will be issued."

Accordingly, the Public List of Available Callsigns on the WIA website was suspended for around two weeks. During that time, the National Office was unable to process any callsign recommendations. Small delays are expected as the backlog is cleared.

If you missed the due date for payment of your renewal and paid subsequently within the 60 days grace period, you may wish to contact the ACMA to follow up. Ensure that you have proof that you made the payment.

Reforms to the Malaysian licence system

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

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

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

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

Continued from page 3

revamp of the WIA office and an associated redundancy payment occurred in the second half of the year. We will not have those costs this year and naturally we will be alert to other savings.

If we can contain costs, the WIA's trading position should improve significantly towards the end of this year. The unusual costs in the second half of 2015 were substantial one-off's, so if unusual costs are not incurred this year, and if membership income follows the same trend, we should be able to turn it around in the second half of 2016.

However, the longer term is more difficult to predict. If we want the WIA to remain a strong advocate for amateur radio, and to continue to protect our spectrum and privileges both nationally and internationally, we need to find more and better ways to make money and reduce the dependence on a slowly shrinking membership income.

For instance, publications like the Foundation Licence Manual, which remain current for many years, are great money spinners. The WIA is on-track to release an ANZAC publication later this year, and if only half the membership buy one, that initiative alone would rebalance the WIA's finances this year, and more.

The WIA, or most other small business for that matter, does not produce detailed accounts on a half-yearly basis, let alone monthly, as the resources necessary to do this would simply detract from essential functions, but this sort of rough analysis does help. As I said, bucket economics.

Phil Wait VK2ASD

P.S. I was really pleased this month to present Dale Hughes VK1DSH with his GA Taylor Medal at the CARC clubrooms, on a freezing Canberra night. I can't think of a more deserving recipient. A fuller report from CARC on the GA Taylor presentation is reported elsewhere in this magazine.

Amateur radio fire bunker

Neil Patton VK3ZVX

In preparation for the fire season, I decided to build an emergency bunker for my amateur gear and test equipment. This is a double-wall stainless steel tank from a dairy which has been clad in corrugated iron. The cavity between is filled with earth to provide insulation. The unit is positioned close to the shack and, in the event of evacuation, I can have my most valuable gear transferred to it in a matter of minutes.

Stay safe this season.

73 de Neil VK3ZVX.

Some uses for centre-off toggle switches

Peter Parker VK3YE

Modern direct digital synthesiser VFOs have made building multiband equipment easier. And tempting. It seems such a waste to be using a stable wide-coverage VFO on a single band project.

Unfortunately it's not all plain sailing. Good RF performance requires several tuned circuits or RF filters per band covered. Multiple bands requires complex switching. Popular methods include plug in coils, diodes, transistors, ICs, relays or rotary switches but each has its shortcomings.

A problem arose when designing a DDS controlled 3.5/7 MHz direct conversion CW/DSB transceiver. While two amateur bands were sufficient on transmit, wide range receive was desired to allow reception of shortwave stations, weather forecasts, ships and outback communication between contacts. Such casual listening required at least fair performance and front-end selectivity to prevent overload from local broadcast stations.

Four switched coils can cover 1.6 to 30 MHz in conjunction with a cheap plastic variable capacitor. Unfortunately space was insufficient for a 4-position rotary switch. 1.6 to 15 MHz continuous could be covered with three positions and was deemed acceptable.

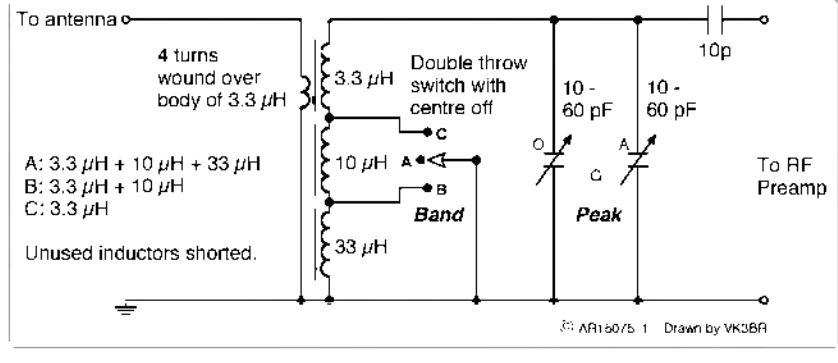
A three position rotary switch is generally the same size as a four position switch so, apart from the additional coil required, it wouldn't save much space. A cut to two bands was contemplated but this would mean removing either 1.6 to 3 MHz or 8 to 14 MHz. The decision was not easy as both ranges are useful; the former includes AM narrowcasters, 160 metres, ships weather and ABC NT services, while the latter covers the busiest international broadcast bands, 30 and 20 metres and more ships weather channels.

A special centre-off toggle switch proved our saviour. Unlike the common double throw switches, it has three positions. The centre pin is connected to one of the two outer contacts in the usual way but there is a third (or 'neutral') position where it's not connected to anything. If correctly connected, this can switch three inductances to provide three bands.

Shorting one coil with the switch gives the middle section while shorting two gives the higher frequency range. Shorting no coils, which is possible when the switch is in its neutral or central position, provides maximum inductance and the lowest frequency range. At all times the smallest coil is in the circuit and it is to this that RF is coupled from the antenna via a few turns wound over its body. This works on all bands, but if additional coupling is required on the lower frequency bands, try turns over one or both of the other inductors as well. Fine enamelled wire is suggested.

Photo 1: Triband tuned circuit in direct conversion transceiver.

Figure 1: Triband tuned circuit for receiver front end (shows the circuit as part of a simple receiver front end).



Moulded RF chokes are used for the inductors. They're cheap, simplify construction and come in handy values from Jaycar. Two sections of a plastic variable capacitor are paralleled to provide a 20 to 160 pF tuning range. That's done by bridging the outer two tabs.

Use an online L, C and frequency calculator to find the resonant circuit of a tuned circuit comprising given inductor and capacitor values. The surrounding circuitry will add some capacitance so resonant frequency will be slightly lower than calculated.

Try different inductance values until you get a combination with sufficient overlaps for continuous coverage. I like having amateur bands in overlaps so that the band can be received with two switch and capacitor settings. This is sometimes beneficial because one setting may be more sensitive or reject interference better than the other.

The Figure 1 values gave the following frequency ranges:

A.	3.3 + 10 + 33 uH = 46.3 uH	1.6 MHz – 4 MHz
B.	3.3 + 10 uH = 13.3 uH	3.2 MHz – 8 MHz
C.	3.3 uH = 3.3 uH	6.5 MHz – 15 MHz

A single tuned circuit front end offers fair performance where reasonably free from strong nearby signals. You'll soon get used to the unusual order of switching bands (middle switch position is not the middle frequency range but the lowest).

The above arrangement also works in equipment other than receiver front ends. L-match antenna couplers require one variable coil and one variable capacitor. The coil is typically either a roller inductor or switched. However if the coupler is for a few bands or one type of antenna it can be simplified with just three inductance positions selectable with a centre-off toggle switch. This arrangement is most suited for portable QRP equipment where it's desirable to save space by building an antenna coupler inside the transceiver.

Better selectivity under hostile receiving conditions is possible with two tuned circuits, typically coupled with a small capacitor. Switching both with one centre off double pole double throw switch saves money and improves ease of use. The only potential problem is that stray capacitance within the switch may over couple and lessen selectivity, particularly at higher HF frequencies. Try it first but be prepared to use one switch per tuned circuit section if performance is inadequate.

I've discussed only two uses for two position centre off switches. However there are many more. Capacitors, resistors or diodes can be switched as well as inductors. This makes them good for VXO crystal oscillators, tone and volume controls, receiver attenuators, voltage regulators and other applications where continuous adjustment is not required and three settings are adequate.

WW2 Robot Rear Gunner

Doug Dowe VK3FDUG

Photo 1: The dish in its mount, with Doug behind.

Photo 2: The feed, counterweight and reflector.

I arrived at a Tuesday morning MDRC meeting many months ago with a microwave dish. I was strongly encouraged to describe its origins and use.

It was part of an Automatic Gun Laying Turret – AGLT. It had a code name of Village Inn. See Photo 1.

This was before robots were part of most people's imagination let alone reality. However it was in truth a robotic gun layer.

Why was it needed? In WW2 the average number of flights survived by rear gunners in British multi-engine bombers was three sorties. This was unacceptable and unsustainable.

The aggression and skills of the Luftwaffe pilots and their tactics was more than a match for most rear gunners, most of whom had limited training and no combat experience before their first flight. Seeing a fighter plane approaching at a closing speed of 300 km/h before it opened fire with cannons at a range of perhaps 400 m was a difficult task. Remember the British bombers flew at night, so the position of the moon and clouds were usually exploited by the fighter pilots.

As the war progressed RADAR had become increasingly sophisticated. By 1943 it was possible to make a scanning radar and remote gun control small enough to fit where the rear gunner had been. The RADAR had a range of several kilometres. Although using valves, mechanics and electrical motors the system could track a detected fighter

Photo 3: The drive motors and gearing for the rotating feed can be seen. The microwave and other electronic equipment were separate.

Photo 4: Village Inn installed on an Avro Lincoln. The gunner was located in the main cabin. There wasn't room for him in the turret anymore, anyway. The Australian built versions did not have the radome assembly hanging on the gun turret but appear to have a smaller fixed radome presumably to house an updated Village Inn system.`

and assist a remote gunner to bring the guns to bear on it. It was coupled to other equipment with which it functioned including means of detecting if the approaching aircraft was friendly or a foe.

Photo 5: Detail of the dish feed.

In Photo 5, a balancing weight can be seen near the dish feed.

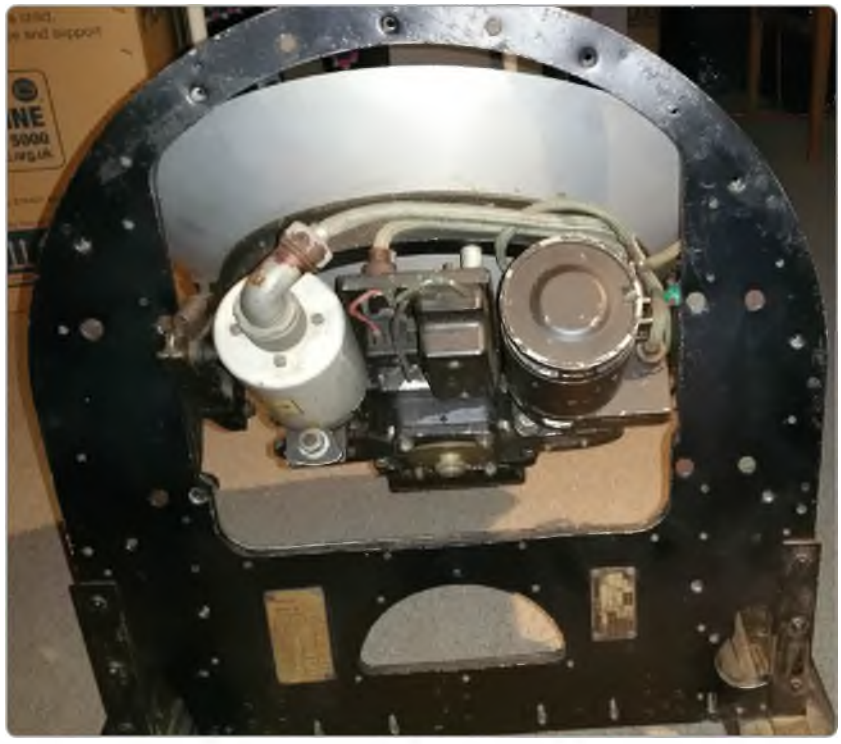


Photo 6: Another view of the hardware for driving the feed and thereby rotating the lobe of the radar to scan the sky.

Photo 7: The name plate/modification record. The stampings here are clear. It appears to record the various modifications incorporated in this unit.

This was to allow rapid scanning of the dish 2,000 rpm with minimal loading on the assembly. The feed is offset and spun. A 30 degree beam width was produced and drive motors gave elevation and azimuth movement. This swept the beam and gave a rapid view of the sky behind the aircraft.

The RADAR operated in the 9.1 cm band. Although it was described at the time as an automatic gun directing radar it could be considered a robot with one task: to seek and destroy attacking fighter aircraft.

Once an aircraft was detected on the radar the gunner had to move the guns so the aiming point coincided with the radar blip as displayed on a small CRT. He could also monitor IFF systems to avoid shooting down friendly aircraft. Once satisfied it was an enemy and it was within range he fired the guns.

The system was developed late in the war and only about 100 were built and deployed. They had a 90% kill rate, far better than a human-only gunner.

Conventional gun controls with the normal allowances for bullet trajectory were used.

Components of the Village Inn systems are now extremely rare.

Thus the loss of airmen was reduced, the accuracy of defence improved over purely manual aiming and more bombers survived.

Post war bombers of all nations were fitted with similar systems. Automatic aiming of airborne weapons systems is now standard although the pilot or weapons officer still has the need to decide to "fire" or not.

(This article originally appeared in APC News from MDRC. Republished with permission of the author and Editor.)

(The author became a Silent Key on 9 November 2015.)

Photo 8: The name plate. One reference says the equipment was known as a TR3548 but the name plate says Type 83. The serial number, 1836 has not been well stamped and originally was stamped as 1835. The stamper seems to be inexperienced particularly compared to the Mod Plate stamper.

HF Digital Voice

John Nunan VK3IC and Peter Wolfenden VK3RV

Australian amateurs take up home-grown Digital Voice on HF

Here is a brief overview for those who might be contemplating an interest in gaining new skills and venturing into a field which is likely to become a significant part of amateur radio's HF future. It has been prepared by John Nunan VK3IC and Peter Wolfenden VK3RV, two new-comers to this particular HF digital voice mode – FreeDV.

Of recent months, it is fair to say that there has been a noticeable increase in the number of Australian amateur stations experimenting with HF digital voice, mainly on 40 and 20 m. Various Digital Mobile Radio systems (APCO P25, Tetra and others) have been in use on VHF and UHF for some years by commercial, and some amateur, stations. HF digital voice has been around on the amateur bands for about 15 years or so (G4GUO – AOR ARD9000 and others), but this "new one" seems to have something going for it, because interest is growing rapidly.

The mode is known as FreeDV - and *it is* free of cost! Now this is not a "Hi-Fi" system by any means but has the potential to significantly alter some of our HF communication procedures with implications of long term benefits for amateur radio.

As mentioned, it is freely available to all. You can simply down-load the software to your computer from www.freedv.org and it's available for Windows, Linux or OSX. You use it with your existing HF radio as you would other popular digital modes such as PSK31, etc.

FreeDV however, has significant "local" input. A key element, the codec2 vocoder, was developed by David Rowe VK5DGR. Other aspects were developed by David Witten KD0EAG and earlier, Francesco Lanza HB9TLK, who in turn was assisted by G3PLX Peter Martinez, the developer of PSK31. But it was David's codec2 which largely brought the mode to where it is today, a workable, entirely open source, digital voice mode, available for all appropriately licensed amateurs to use and experiment with.

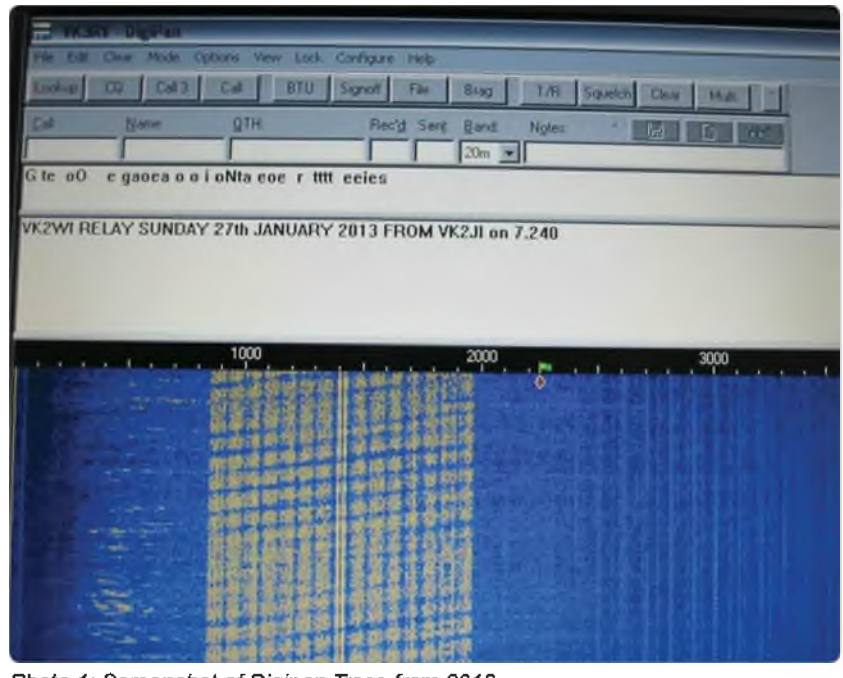


Photo 1: Screenshot of Digipan Trace from 2013.

A bit of back-ground, Peter's experiences with FreeDV

I first encountered this mode while putting together a short presentation on PSK for the Macedon Ranges Amateur Radio Club. I decided to take some video of PSK signals on the Digipan PSK waterfall to demonstrate the decoding process to club members in real time, when up popped an odd signal on 40 m. It was something I had not seen or heard before. This signal consisted of a number of parallel vertical lines creeping down the waterfall accompanied by a loud buzzing sound. The signal appeared to be about 1200 Hz wide and ran continuously. I kept the camera rolling so that I had some image and sound to work with later and also to show others. Without going into all the "ins and outs", I soon discovered that the signal was a relay of a VK2WI news broadcast and when I finally found the appropriate software, managed to decode a small segment, enough to confirm that it was indeed a FreeDV transmission of the VK2WI news. This was in 2013. There the matter rested. I gave the PSK presentation to MRARC and a couple of other groups and ended up each presentation with describing how I use the Digipan waterfall to look at and identifying transmissions other than PSK31, and then finishing the presentation with the small burst of FreeDV signal from the NSW news broadcast.

In September last year, the SA Amateur Radio Experimenter's Group (AREG) operated VK100ANZAC from near Mannum on the Murray River, using digital voice. I am a member of a regular Sunday morning net on 40 m which involves a few local and near country operators and the VK100ANZAC signal came up close to the frequency we were using. By this stage, I had down loaded the latest software to a "newer" PC and succeeded in decoding and confirming VK100ANZAC, together with some VK2s and VK4CAG who were all attempting to contact the special event station. Conditions were not good that day but hearing a VK4 for a short time and in the clear under the poor fast fading conditions, won me over!

A few weeks later, John VK3IC, told me that he had learnt that a "Smart microphone" was now available for FreeDV from Rowetel (VK5DGR) in Adelaide and he was going to make a purchase and suggested that I should do likewise – I think he wanted a local signal to "play with"! He duly made his purchase and a couple of weeks later, I found myself in Adelaide and with my arm still twisted up my back, phoned David and arranged to meet him and purchase an SM1000. This was in late September 2015.

After making up connection leads for the SM1000 (stereo 3.5 mm plugs) and appropriate plugs for our respective radios, and organising a nominal 12 volt DC supply, John and I managed to get our "blue boxes" working. We conducted a few tests including some from Murray Bridge in SA to Sunbury, Victoria, on 40 m. Soon we were joined by Graeme VK3NE and Brian VK3CCR, both using the software or Graphic User Interface (GUI) version on their computers (without the SM1000s). We were all on a steep but exciting learning curve.

It was about this time that a much needed, regular signal appeared on 7177 kHz LSB (an internationally recognised DV operating frequency) most Sunday mornings. Members of AREG (perhaps with a bit of prompting) kindly arranged to re-broadcast the VK5WI Sunday news at 0930 AEST. This provided a known signal to tune into and get equipment working. Subsequently, it has also succeeded in bringing more FreeDV stations on to the air each Sunday morning. At this point in time, they are mainly VK5s, where most of the activity is located, but closely followed by VK3s and a couple of VK2s have also appeared on the "DV call back". Over the past months, I have heard or worked over 35 stations mainly on 40 m with quite a few others known to be listening in or about to commence operations. Things are changing so quickly, that since the first few paragraphs of this article were drafted, contacts have been made with most Australian States and excellent 20 m contacts made with Peter VK3FPL/4 and Graeme ZL2APV in New Plymouth. As I said earlier, interest in this mode is growing rapidly!

Photo 2: SM1000.

Just like FM – a great feature of FreeDV!

I operate frequently from an area down-river from Murray Bridge in South Australia where electrical noise can be a major problem due to the multiplicity of rural HV and distributor power mains nearby. This often manifests itself as an S9+ noise level on 80 and 40 m. The first time I experienced good quality DV reception on 40 m with this noise level running and an S8 to S9 DV signal being decoded in front of me, **noise free**, I thought: "this has to be an answer for amateurs suffering the wretched increasing barrier to our hobby – noise, especially in high density suburbs". It took my thoughts back to why I originally developed an interest in PSK31 many years ago, which was partly related to the fact that one day I will have to give up my nice quiet semi-rural environment for a more "appropriate, smaller block of land and house" where I will be forced to continue my life-long hobby in a "stealth-like", low powered manner!

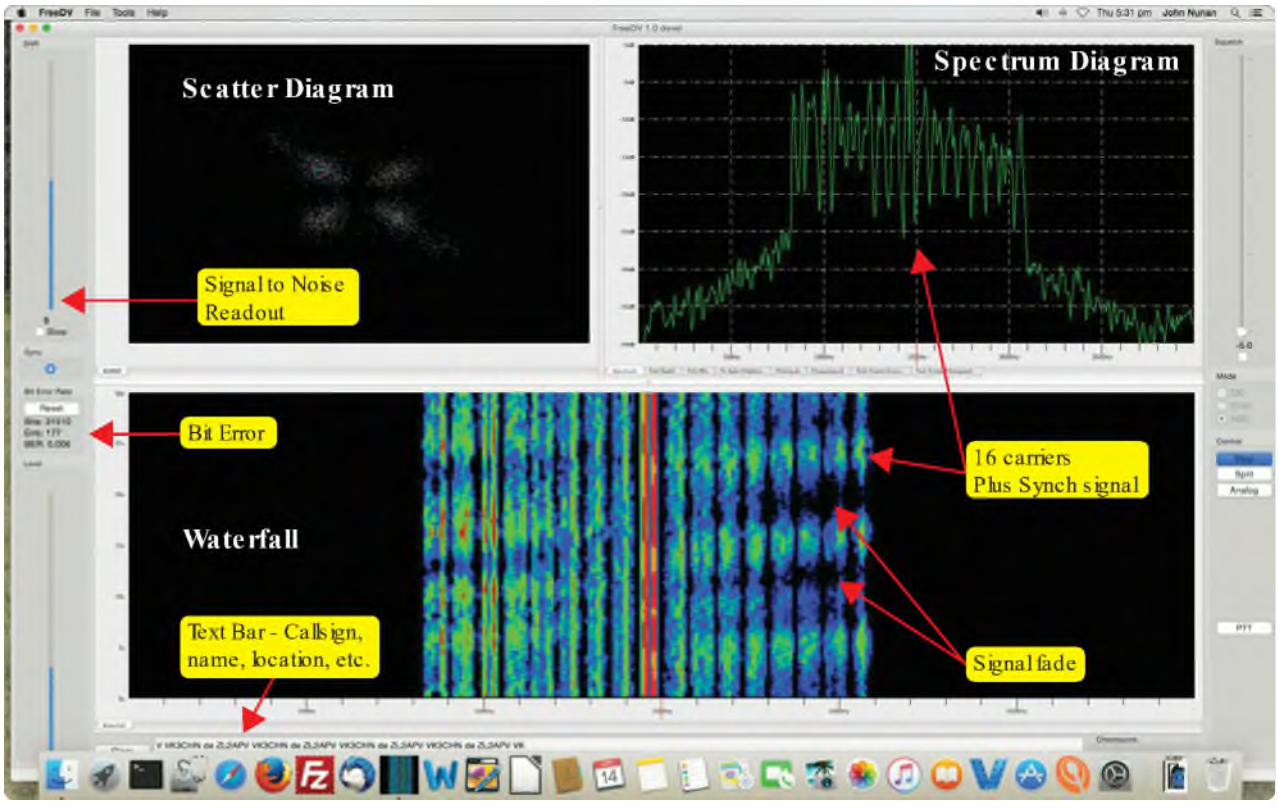


Photo 3: Screenshot of typical computer screen with explanations.

FreeDV could be another answer to this problem which lays in waiting for most of us! Best to try it out now and get one's head around it!

John picks up the story

As you have gathered, there are currently two methods of operating on this mode:

- Using the SM1000 Smart Microphone which can be purchased for just under $200 plus freight. For further information go to *www.rowetel.com*
- The other method is to download the FreeDV software from www.freedv.org. This can easily be done and decoding is usually quite easy to achieve. Setting up the transmission side is a little more complex and can often be simplified by using a USB head-set. The computer is dealing with encoding and decoding 'radio' digitised audio, and providing local analog mic and speaker/headphone audio. There are two separate audio channels in use – two inputs – two outputs!

The internet contains plenty of information about this as well as the **Help** function within the FreeDV GUI software. Don't forget that you will probably be setting up for reception *and* transmission. Look under **Tools**, **Audio Config** at the top of the FreeDV software page and then the accompanying **Receive** and **Transmit** tabs on the pop-up screen. You need to carefully identify the audio device to be used for radio as well as the local analog audio. You will also need to set up the **PTT Config** which is located under **Tools**. Take your time with this, follow the prompts and test as you go. FreeDV can also be PTT'd using VOX. As a constant level of audio is applied to the TX, there are no vox induced dropouts

The GUI or computer version opens up many features which are worth seeing and using. A number of amateurs use the SM1000 for transmission/reception and an audio leak-off to the computer display for monitoring the incoming signal only. From this, you can report on the quality of the received signal, look at audio levels and note effects of fading etc. while you are learning more about this mode.

VK3CHN - a triggered HF Beacon – Free Beacon

On a subsequent visit to David VK5DGR, in November, a thought balloon established some parameters for a triggered Beacon, involving GUI based stations calling the beacon in their Text line, generating a canned FreeDV RF response. In addition, a status line showing local sig/noise and some other relevant parameters is shown in real-time on the associated Free Beacon micro website. The incoming transmissions are recorded in both signal tones and recovered audio files for up to a minute. They can be played back within a web browser.

David's re-cut of some existing FreeDV code, ported to a Raspberry Pi, came online on December 24th, 2015. Coupled into some surplus radio equipment and an inverted Vee on 7177 kHz, this has been very stable. A transmission incorporating the text 'VK3CHN' is used as the trigger.

Further information on the little Free Beacon website is available by contacting *john@bungama.com*

Operating information

Net frequencies

Currently, the frequencies used in Australia are:

40 m, the main net frequency is 7177 kHz. When that frequency is occupied 7180 kHz has often been chosen as an alternative. However FreeDV has a similar "capture effect" as FM. It is possible for a number of groups remote from each other, to operate on the same frequency. Often groups can be heard in Adelaide and Melbourne working independently of each other without apparently causing mutual interference. This also depends on current propagation conditions at the time.

On **20 m**, the frequency is generally 14236 kHz. This also appears to be the case in both the USA and UK/Europe, however, the limited experience on this band with Over The Horizon Radar systems operating, seem to require the need to QSY to a clear frequency to minimise problems associated with loss of synch.

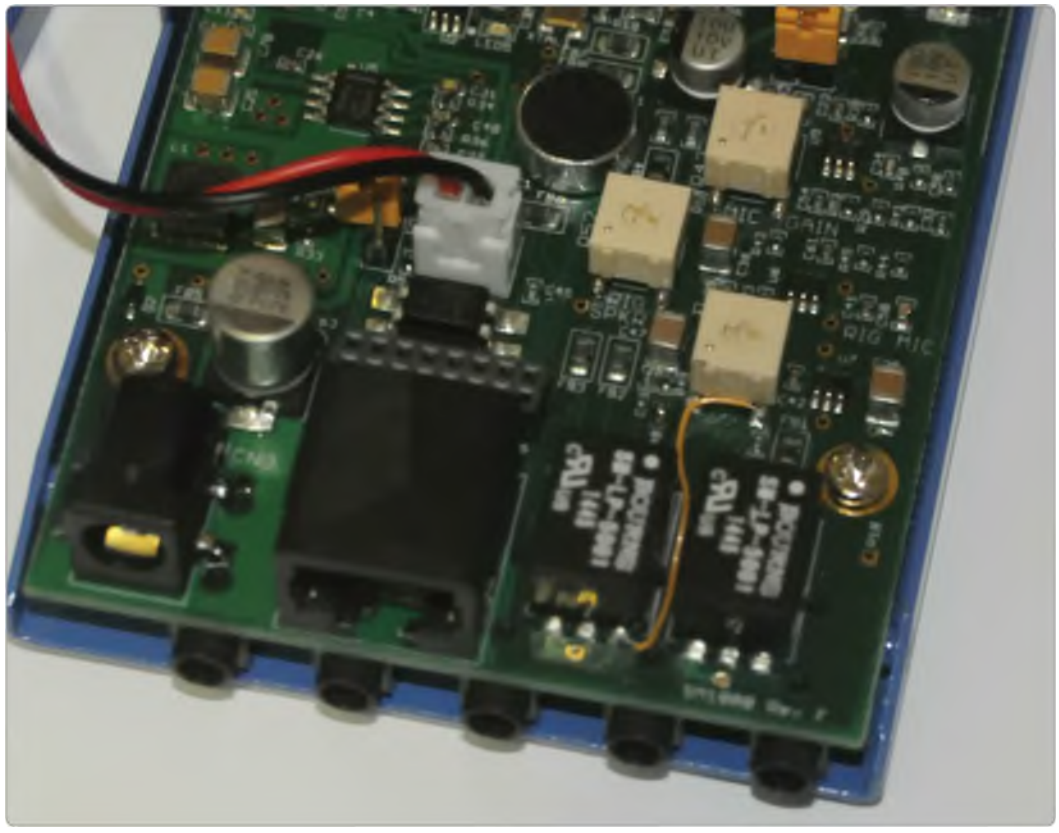
Transmitting and Receiving – a few suggestions:

The set-up of Transceivers should follow the same lines as for other digital modes. Switch off RIT, and TX offset, turn off speech processing and ensure you have little or preferably no ALC reading and don't attempt to run high audio levels – it won't help, but rather hinder successful use of the mode. Think of it as using FM. All knobs hard right, won't work. It only causes problems for you and probably your rig! Deprecating the quality of the transmitted Digital signal (in particular the Synch carrier) to get higher output power ends up counterproductive.

The SM1000 can be connected directly to your transceiver's microphone input socket and headphones output socket. Suitable setting of the appropriate trim-pots is necessary. You can then use it as a microphone/speaker combination. There is a PTT button located on the side of the SM1000, or you can organise an alternative PTT, perhaps a foot operated switch. If you are uncertain about adjusting the various pre-set trim-pots, work with someone who is able receive your transmission on the various displays of a GUI configured computer. They should be able to steer you towards a reasonable operating set-up.

An alternative and better (in my view) way to use the SM1000 is by using it as you would with older digital modes. The SM1000 does have its own inbuilt interfacing. If you are inclined to using the "TNC input" available on many transceivers, on Rev D and E SM1000s you will require the addition of a fine bridging wire within the SM1000 to lift its output level to around 350-400 mV of audio. The wire is used to short out R48, a 10k resistor associated with the built-in interface. This modification

Photo 4: Close-up of shorting wire.



is fine work and will require some skill, so don't attempt it yourself if you are not familiar with appropriate procedures for this level of soldering. Ask for help from a suitably skilled person – most clubs have them! The current (Rev F) SM1000 has an internal selectable link enabling this Level of output, and does not require this modification.

Transmitter, "quick start"

A simple and effective transmitting quick start is to set the radio to run at full output without any form of compression and no audio response shaping. Reduce FreeDV rig mic audio to zero, set PTT on, then increase the rig mic audio until about twenty watts of RF output (no need to speak) is achieved on a typical 100 watt transceiver. Then gradually increase the FreeDV (or SM1000) Mic Input until audio (not RF) clipping occurs. Back off until no indications occur on speech peaks. Get feedback from another station on audio quality issues but remember this is a **reconstituted** audio. It will sound a little different.

Approach it systematically, get it working effectively, then fine tune the settings.

Reception decoding for the GUI version

After setting up the FreeDV software on your computer along the lines mentioned earlier, simply feed received audio to the appropriate FreeDV input, and gradually increase the level until audio decoding occurs. Everything should then fall into place if you have correctly allocated your computer sound cards.

John's Mobile Operations.

On a recent Sunday Road Trip from Sunbury to Adelaide, I was lucky enough to be mobile on 40 m with an SM1000 driving the data port on a Codan, with an autotune and 1.2 metre whip.

Path distance was roughly 500 km at the time of the VK5 FreeDV broadcast. The experience was very similar to VHF FM services with no un-mute available. I could get perfectly understandable voice – or nothing!

For about 20 percent of the time I had a good handle on the words used, but getting enough for context was the challenge. The raw input to the receiver speaker, the tone set in use, at times went into the noise, but the recovered digital voice came back almost as quickly as the raw audio.

The limiting factor for me was the need to keep moving, but at about 450 km things got a bit better. Then the session ended. Bits and pieces of callback activity were decoded from various sources but not enough to identify just which paths existed. Propagation is an area of study in itself and that 1.2 metre whip has worked FreeDV to the Sunshine Coast on 20 metres without losing a beat. At about 30 watts, it certainly encourages further experimentation.

Further Information

The following websites have good information if you take up an interest:

- *http://www.rowetel.com/blog/?page_id=3902*
- *freedv.org*
- *QST* January 2016, page 60, has a review of the SM1000.

Using eQSL

Robert Janoska VK4AAC

As you may know, eQSL is a great way of sending and receiving QSLs electronically. It's quick and easy, so much so, sometimes you may find eQSLs waiting in your INBOX by the time you get home from an activation. In this fast paced world it certainly beats waiting months for cards to arrive via the bureau.

Here is a little known anomaly in eQSL of which some people may not be aware...

You will not see any eQSLs sent to you if your callsign on the incoming eQSL does not exactly match one of your callsign accounts.

For example, if you have one eQSL account for your callsign e.g. VK4ABCD and you make a contact and the other station sends you an eQSL with VK4ABCD/p, thinking you were a portable station, you would not see that eQSL in your INBOX. You would need to create another account for VK4ABCD/p to be able to retrieve the eQSL.

If you operate solely from home then you would only need one account in your primary callsign.

If you like to operate mobile and/or portable then you need to create accounts for your callsign with a /m and another with a /p. If you occasionally operate from interstate then you would need to have another account for each state you operate in with a /1 or /2 or /3 etc.

Figure 1: The eQSL homepage.

NOTE: If you only have one account and you think there might be some eQSLs waiting for you, you can do a search in *eQSL.cc* using your callsign with a /m or /p or /1 etc., you might be surprised what you find.

Just enter your callsign, with the added suffix you are checking for, into the box to the left of the "Binocular" icon then click on the icon (See Figure 2).

It is quite easy to add accounts in *eQSL.cc* Just go to the "My Accounts" page in *eQSL.com* then go to the bottom of the page to "Register a New Attached Account" and follow the instructions (See Figure 3).

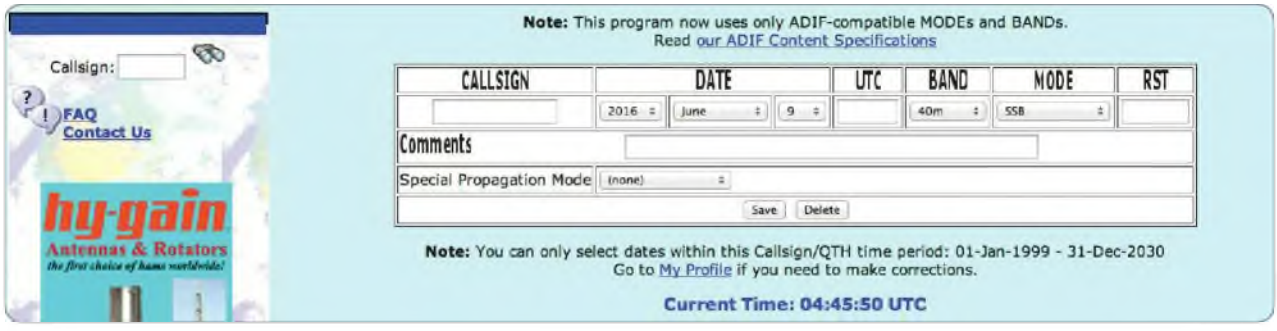
The new account will be added at the top under your current account (Figure 4).

The point is, if you want to receive all eQSLs sent to you, then you need to identify yourself as per an account you have created in *eQSL.cc* Consequently, the contacted station needs to log your callsign, in eQSL, as indicated by you.

Example: if a station identifies themselves as "VK4ABCD portable" then you need to send your eQSL to "VK4ABCD/p", if the station identifies as "VK4ABCD mobile", then you need to send your eQSL to "VK4ABCD/m" etc.

Now here is the tricky part..... if you are portable or mobile in

Figure 2: Callsign Search dialogue.



Register a New Attached Account

It is easy to register a new Account with the same callsign and a different QTH, or even a different callsign, and have it automatically *attached* to this callsign.

By using this feature, you can set up a new account without having to go through the normal registration process.

Just modify the information below for the new account, and it will be automatically created with your current Password. It will also appear above in the Account List at the top of this screen, so you can log into that account easily and quickly.

Specify a unique Nickname for this QTH that you have not used before.
Do not register new accounts here if you are not the official owner of the callsign!
Contacts made by this account will be combined with yours for purposes of eAwards, so please do not attach a club callsign, a spouse's callsign, etc.

Callsign	Start (MM/DD/YYYY HH:MM)	End (MM/DD/YYYY HH:MM)	QTH Nickname	CQ Zone / Grid Square
	01/01/1999 00:0 UTC	12/31/2030 00:0 UTC		Zone: Grid: (Map) (Map) (Map)
City	**US County**	**State/ Province**	**Country**	
	No USA County	No State	AUSTRALIA	

Create New

Figure 3: Registering a new Attached Account.

another state, what do you put on the eQSL? /p3 or /3p etc.?

This is where we all need to be a bit more diligent by listening to what the other station is using as an identifying callsign. The suggestion for simplicity is that we use just the /3 or /2 etc. even if you are mobile or portable when **not in your own state**.

As a **Park activator** or a **SOTA operator**, the suggestion is, if you are a portable or mobile station within your own state that you identify yourself using a /p or /m. If you are in a **state other than your own**, use /1, /2 or /3 etc. without identifying as portable or mobile. Of course, you will also need to create accounts in eQSL for your callsign with the appropriate "/?" you will be using for your activation.

There is no need to entertain the idea of using /p2 or /2p or /m4 etc., this would only confuse the issue, BUT, it is certainly up to each station to identify themselves whichever way they choose and have the corresponding account in eQSL. *(Editor's Note: Definitely not /p2 etc., as the letter indicates a prefix "P2", in this case Papua New Guinea, with "P3" allocated to Cyprus, etc.! This is a common error seen on some of the Spotting sites!)*

Of course, for most people this not going to be much of a problem, you can just add a couple more accounts covering portable and mobile, BUT, for some who travel interstate to activate parks or SOTA summits, this means creating a couple more accounts to cover your operating locations interstate.

Now for the legalities according to the ACMA: According to the senior policy officer in the licensing section of the ACMA, when in a state other than your own, you only need to add the /# or say the states name after your callsign, e.g. if you have a VK4 callsign and you are in VK5, then your minimum legal requirement is to say "VK4ABCD/5" or "VK4ABCD in South Australia". The same goes for telegraphy.

We are not legally required to indicate that we are mobile or portable whether you are in your own state or not.

Of course, as amateurs, we can use other forms of identifiers such as "portable" or "mobile" or "pedestrian mobile" etc., but we are bound by the Amateur LCD, when not in our own state, to indicate which state we are currently in as part of our callsign identifier.

Ultimately it is up to each licence holder to identify himself or herself, on air, according to the Amateur LCD as a minimum requirement. Any additional information regarding their operating condition is up to the individual operator, provided that it doesn't cause possible confusion.

Email: *dorisrobj@gmail.com*

Figure 4: The My Accounts dialogue, with the new account added.

My Accounts

Here are all the accounts currently *attached* to this one you are currently logged into. By *attaching* all of your accounts, you can log out of one account and log in to another one by coming to this screen and clicking on a LOGIN button below.

It will also make it possible to consolidate credits from all your eligible accounts for our eAwards!

When you *attach* accounts to each other, they will still maintain separate logs, separate eQSL designs, and their own separate QTH information. The same membership level will be enjoyed by all attached accounts, based on the combined total of donations made into the attached accounts.

You should only attach accounts for callsigns that belong to you personally. Otherwise, you will be accumulating credits for eAwards that other people should be getting!

Actions		Callsign	Start	End	Design	AG	Grid	City	Gov Sub 1	Gov Sub 2	Country	New eQSLs
Login	Detach	VK4AAC (VK4)	01-Jan-1999 00:00	31-Dec-2030 00:00			QG62MQ	Sandgate			AUSTRALIA	
Login	Detach	VK4AAC/2 (VK2)	01-Jan-1999 00:00	31-Dec-2030 00:00			QG62MQ	Sandgate			AUSTRALIA	
(Current)	Detach	VK4AAC/3 (VK3)	01-Jan-1999 00:00	31-Dec-2030 00:00			PF84OF	Sandgate			AUSTRALIA	
Login	Detach	VK4AAC/1 (VK1)	02-Jan-1999 00:00	31-Dec-2030 00:00			QG62mq	Sandgate			AUSTRALIA	
Login	Detach	VK4AAC/5 (VK4AAC/5)	02-Jan-1999 00:00	31-Dec-2030 00:00			QG62mq	Sandgate			AUSTRALIA	
Login	Detach	VK4AAC/P (VK4P - All states)	02-Jan-1999 00:00	31-Dec-2030 00:00			QG62mq	Sandgate			AUSTRALIA	
Login	Detach	VK4AAC/P5 (VK4P5)	02-Jan-1999 00:00	31-Dec-2030 00:00			QG62mq	Sandgate			AUSTRALIA	

GippsTech 2016

Justin Giles-Clark VK7TW

Photo 1: Collage of GippsTech 2016 (photos by VK7TW).

GippsTech is the premier VK - VHF and above and weak signal conference and this year was held over the weekend of 9 and 10 July 2016. The conference is organised by the Eastern Zone Amateur Radio Club and the convener is Peter Freeman VK3PF and they do a fantastic job. The location is the Federation University Australia at Churchill and is an excellent venue.

The format is one and half days of lecture/presentations with an informal dinner on the Friday before the conference and an official conference dinner on the Saturday night and we finished up with a pizza lunch on the Sunday to give people time to get back to their home QTHs. There is a pre-loved area and bookshop by Peter VK3FPSR of Pages of Cobram and displays showing amateur's equipment and home-brewing.

The following is a precis of the presentations and does not do them justice!

We started the presentations with David VK5KK's excellent expose on his VHF and microwave SDR adventure. This included the mcHF and the UHFSDR by WB6CGR. David pointed out the recent release of the LimeSDR and this will certainly be the next big microwave SDR!

Alan VK3XPD outlined the Microwave Enthusiasts Award and announced the inaugural recipient as Doug Friend VK4OE. Congratulations Doug.

The next presentation was by Joe VK3YSP and Julie VK3FOWL on the Schools Amateur Radio Club Net activity on ANZAC Day with the SARCNet school kids, Scouts and volunteers. This event was covered in the August *AR* magazine. There was even a demonstration of the balloon launch during the presentation.

Joe and Julie continued into the next presentation on the Automatic Identification System (AIS) used on shipping. Joe and Julie took us through setting up an RTL SDR dongle with a RaspberryPi to automatically report local shipping activity.

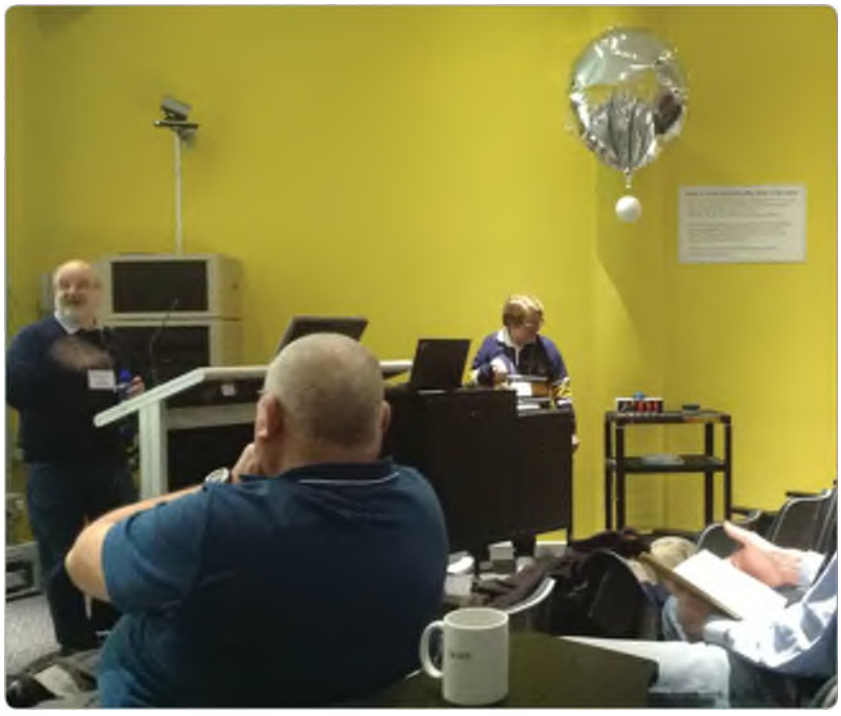


Photo 2: Joe and Julie demonstrating the High Altitude Balloon launch (photo by VK7TW).

Glenn VK1XX then outlined the next generation of semiconductors that are hitting the market – Gallium Nitride and Silicon Carbon devices. These devices have very low capacitance, low on resistance and therefore are excellent for microwave frequencies and the SiCs have high breakdown voltages and can run hotter than current devices.

Roger VK2ZRH then presented the possible future of our amateur radio regulation in VK with some interesting discussion. The WIA's position is we cannot go backwards with conditions, bands, modes, etc. as they start the negotiations. A hearty lunch followed.

The first afternoon presentation was David Rowe VK5DGR on his open source – SM-2000 VHF SDR with embedded FreeDV and this presentation is now available on the author's YouTube Channel.

Joe VK3YSP and Julie VK7FOWL then did a presentation on a homebrew speech synthesiser for the FT-817 and we met the British female voice nicknamed Rachel.

Glenn VK1XX presented on the near effects of ground on your field day setup or repeater site and this prompted some interesting discussion and thoughts into the night.

The last presentation for the day was Tim VK5ZT with his alternate 3.4 GHz Panel mods. These panels were made popular by the Geelong ARC at last year's GippsTech and Tim has improved on the modifications and simplified them.

The GippsTech Dinner was held at the Morwell Club with over 120 people attending.

The first presentation on the Sunday was Rex VK7MO who

Photo 3: GippsTech Official Dinner held at the Morwell Club (photo by VK7TW).

presented about QRP EME on 10 GHz. Rex took the audience through his experiments with Charlie G3WDG and the EME low liberation experiments which enabled them to drop the power to 5 W between the 77 cm and 3 m dishes.

Julie VK3FOWL and Joe VK3YSP then presented their homebrew Arduino based az-el satellite antenna rotator that they use on the SARCNet activities. This was a great project and involved some tricky conversion calculations using the $11 accelerometer as a gravity meter.

Roger Harrison VK2ZRH gave us a humorous picture collage of his Norfolk Island microwave jaunt during the WIA AGM using the GARC modified 3.4 GHz panels.

Dale Hughes VK1DSH then presented on his Arduino SSTV TX/RX adventure and he promoted this as a possible advanced STEM project to introduce students to TV technology.

Rex VK7MO then gave the audience an update on WSJT-X program and some of the great built in features of the program for system performance testing and power prediction.

The last presentation was from Dave Hardy VK2JDH on his Android phone controlled Arduino microcontroller via Bluetooth and WIFI. Dave demonstrated the easy to use internet based application to setup the control screen and download the Arduino control code. This has some great AR applications and is very easy to use.

Three themes were prevalent at GippsTech 2016 – Software Defined Radios, Arduino controllers and Coding and the author believes we are seeing the predicted transition from soldering to programming for home brewing – watch this space!

The raffle was drawn and the Pizza lunch was enjoyed, farewells and back to Tullamarine to fly home and a special thank you to Rex VK7MO our wonderful driver!

This is my 11th GippsTech and I always come away from these weekends inspired by the creativity in the presentations and wonderful social atmosphere and have made many friends who catch-up with each year.

Keep your eye on the Eastern Zone ARC website for GippsTech 2017 and I'll see you there.

http://www.vk3bez.org/gippstech.html

73, Justin VK7TW.

Photo 4: Alan VK3XPD 24/47 GHz Homebrew Transverter (photo by VK7TW).

Contests

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

Contest priorities for September

Contest	Date (UTC)	Rules	Difficulty	Software	Modes
Russian DX	3 Sept	Radio Ru	Medium	N1MM/TR4W	RTTY
All Asian DX	3/4 Sept	JARL	Easy Fun	N1MM/VKCL	SSB
WAE Dx	10/11 Sept	DARC	Hard	N1MM/TR4W	SSB
CQWW Dx	24/25 Sept	CQWW	Easy	N1MM/TR4W	RTTY

All Asian DX: Some ideas on entering the contest.

The All Asian Contests are great from Australia. Without doubt we have the best propagation to Asia and can beat regular contest big guns.

The antennas needed for Asian DX are not as exotic as needed for a contest where you need to work North America. A simple tribander and dipole can be enough to put in a competitive score.

Select the band you can run well on but also listen to bands either side.

The multipliers are the total number of different Asian prefixes on each band.

Information technology is encouraged packet cluster etc is fair to go band. Change limits only apply to multi operators - Single ops can jump all over the place chasing multipliers.

Good luck in the contest.

Photo 1: VK3ER/p TEAM (L to R) Mike VK3AVV, Jack VK3WWW, Greg VK3ND, Jonas VK3VF, Peter VK3QI.

Photo 2: Inside the operating tent (L to R) Mike VK3AVV, Peter VK3QI, Jack VK3WWW, Andrew VK3BQ.

RD Contest: Don't forget to send in your Logs!

WAE DX Contest

What is hard about working Europe?

Other than being 15,000 km away from the east coast, there is the issue of QTC traffic in the Worked All Europe Contest.

"The unique feature of QTC-traffic adds much fun and another operating challenge to the contest.

Here the DX stations transfer real telegrams to the European stations. These telegrams contain data of previously logged QSOs. Each of these records counts one additional point for the sender and the receiver, given that the complete record was logged correctly.

Thus, DX stations can actually double their score by sending QTCs. Some European stations, and not only the leading ranks, gain more than 70 percent of their score from QTC traffic." Your software needs to be setup to handle QTCs as the points scored amplify your end score greatly: read up on the QTC arrangements in your preferred software. Of course you can still simply work the stations and respond with NO QTC.

Contesters Tricks: The Headset

In the most common modes of CW and SSB a headset is a must. In multi ops it helps making a racket but above all it allows you to concentrate on the incoming signals and drag them out of the dirt.

Two main configurations are the headset plugged into the rig and the headset plugged into a PC that then plugs into the Rig. The PC option allows you to use additional software to tweak the sent and received audio. The direct to rig option is for simple installation and suits portable operation.

Headsets worn over the time of a contest can become surprisingly uncomfortable. When I first started contesting I used two different headsets that caused pain to different parts of the head over time- the things we do in the enjoyment of the hobby.

My personal preference is the Heil ProSet Plus which I have used for several 48-hour contests. These headsets have dual microphone cartridges and can be setup for different rigs by switching the cartridge.

By using the PC option, you open up the gamut of PC gamer style headsets and there is a plethora of options and most are very comfortable. One very popular series is the Koss SB45 and its USB relatives.

Headset selection is a personal thing. Be guided by your friends but beware the option may not suit you.

Contester of the month

This month we asked the questions of one of the top VHF UHF Microwave Teams from Victoria to VK3ER, the Eastern and Mountain District Radio Club Field Day Contest Group.

What are your favourite rigs?
We use IC-706MK11G, IC-7000 and TS-2000X transceivers for 6 m, 2 m, 70 cm and 1.2 GHz. For 2.4, 3.4, 5.7, 10.3, 24.1 and 47 GHz we use a variety of DEMI, Kuhne, MiniKits and homebrew equipment.

Antennas consist of a Yagi for 6 m, stacked Yagis for 2 m and 70 cm and a variety of parabolic dishes (ex C band and K Band satellite dishes) for the higher bands. On HF, 80 m and 40 m dipoles are used.

What modes do you contest in?
Mainly SSB is used. Occasionally we have been known to use CW and Digital for some of the more difficult contacts.

What is your favourite contest band and why?
As a multi-op contest station, every band is our favourite! Each contact obtains us points and a contact on 6 m can be just as important as a contact on 24 GHz.

Photo 3: 2 m antennas: 13 element horizontal stack for SSB, 13 element vertical beam for FM mounted on 6 metres rotatable pole.

What is your preferred Contesting Software?
One of our team is Mike VK3AVV, the developer of VKCL. Over the years, Mike has been able to develop the VKCL software to the point where we can network all our

Photo 4: Trailer with 1.2/2.4 GHz dish and 3/5/10 GHz dish and 24 GHz dish.

Photo 5: Close up of dual feed 1.2/2.4 GHz dish with masthead preamps, 24 GHz in foreground.

operators. VKCL is used exclusively.

What is your preferred Mic and Key?

Generally we use original hand mikes but some of our team prefer homebrew headsets with electret inserts. Voice keyers are also used for CQing etc. For CW we use the Hi-Mound HK-706 Dual Paddle and a CW keyer is operated in beacon mode for substantial periods of time.

What is your "not so secret" weapon?

Our current Field Day location at McLaughlin's Lookout (QF22DM) is an excellent one for the following reasons: it is high, has a clear take-off, many kilometres from any power lines and microwave towers and any noise can be controlled by us using specially constructed noise filters which are particularly matched to the current Inverter Generators in use. For details, look at VKLogger Forum topic

http://www.vklogger.com/forum/viewtopic.php?f=31&t=13534&start=20#p60419

We often hear complaints from other contesters about the noise level from their generators. With good filtering we can hear right down into the low background noise level.

What are your best tips to a newbie field day contester?

1. *Start off small – just 2 m and 70 cm to get you going and some simple Yagi antennas and some HF dipoles for the JMFD.*
2. *Consider a good quiet location (for HF not necessarily high but for VHF/UHF, high is good).*
3. *Make sure that you inform other contesters that you are going to be about and where. In that way you will be "in the hunt" for contacts by others. Contest Radar is a good site to inform others: http://contestradar.com/*
4. *Remember that on VHF/UHF, SSB is preferred which means 144.150 and 432.150 and*

Photo 6: 6 m 4-element Yagi at 6 m height.

Photo 7: Close up of triband feed 3/5/10 GHz dish and 24 GHz dish.

upwards become important frequencies – with directional Yagis, be prepared to turn the antennas for best results.

5. *Consider having others with you for company, even if you plan to be a single operator – much more relaxing when you are portable to have someone with you.*
6. *As you develop your skills, consider increasing the number of bands that you can operate on.*
7. *If you venture up into the microwave bands, consider GPS locking of your rigs for accurate transmit and receive frequencies – we can be within 10 Hz on 47 GHz, using GPS locking.*

VK3ER/p started out as two operators on 2 m and 70 cm and now has 4 to 6 operators on 80 m and 40 m on HF and 6 m all the way up to 47GHz.

In 2011, Ralph VK3LL made a 50 minute video of our station as it existed in 2011, which YouTube has kindly allowed us to post. Since that time our station has evolved, especially in the antenna area with larger parabolic dishes and masthead preamps for all bands.

Definitely worth watching:

- *https://www.youtube.com/watch?v=Z_uZ3RAd9As* and
- *https://www.youtube.com/watch?v=ZEftWGjssvA*
- and an earlier video from 2010 *https://www.youtube.com/watch?v=H657gVuHCFU*

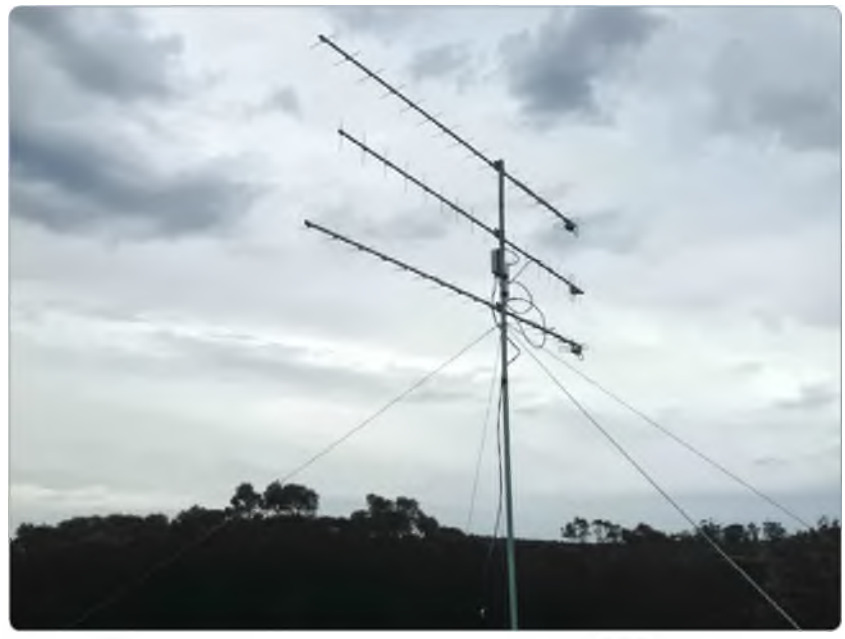


Photo 8: 70 cm antennas - 19 element horizontal stack for SSB, 19 element vertical beam for FM mounted on 6 metres rotatable pole.

VK3ER are keen to work new stations in the field days - be sure you give them a call.

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.

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*

Participate

SUNFEST Sunshine Coast ARC Hamfest	10 September
SADARC Hamfest/Comms Day	11 September
Central Highlands AGM / Social	23 - 25 September
Jamboree on the Air JOTA	15 - 16 October
BARG HAMVENTION, Ballarat Amateur Radio Group	16 October

RAOTC QSO Party 2016

Ian Godsil VK3JS

All licensed Australian amateur radio operators are invited to participate in the annual QSO PARTY sponsored by the Radio Amateurs Old Timers Club Inc.

This is not a contest, just an on-air meeting of RAOTC members and fellow amateurs.

However, we do invite you to submit a log of your contacts for listing on our web page.

Date: Saturday, 8th October, 2016

Time: 0500 – 0700 UTC in two one-hour blocks (0500-0600 40 metres, 0600-0700 20 metres).

The **object** will be to make as many contacts as possible, especially with members of RAOTC. Repeat contacts in second hour encouraged.

Bands: 40 and 20 metres.

Modes: CW, AM, SSB

Suggested Frequencies:

40 metres: CW 7020 kHz, SSB 7080-7090 kHz, AM 7120 kHz

20 metres: CW 14040 kHz, SSB 14160-14170 kHz, AM 14150 kHz

Call: CQ OT or CQ Old Timers

Exchange: Callsigns and RST report.

Scoring: * one point per contact. * add 25 points for using a radio 25 years or more old.

Logs: In order to acknowledge your participation, you are invited to send a log of your contacts, so that a list may be compiled for publication in the monthly broadcast and on the RAOTC web page. Your list should show the name and postal address of the operator submitting the log, the number of contacts with callsign, RST exchanged, points claimed and whether you used an older radio or not.

Send Logs to: Secretary, RAOTC, PO Box 107, Mentone, Vic, 3194 or via email to raotc@raotc.org.au by Friday, 14 October, 2016.

If sending by email and no acknowledgment is received, please resend.

Certificates will be issued to:
*scorer with highest total contacts;
*highest scorer using an old rig;
*highest scorer in each mode in each hour.

Find these Rules on the Web:
raotc.org.au

AMSAT-VK

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

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

Website:
www.amsat-vk.org

Group site:
group.amsat-vk.org

About AMSAT-VK

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

AMSAT-VK monthly net
Australian National Satellite net

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

In New South Wales
VK2RBM Blue Mountains repeater on 147.050 MHz

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

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

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

In the Northern Territory
VK8MA Katherine 146.700 MHz FM

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

Become involved

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

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

Winter 2016 VHF-UHF Field Day Results

Winter's tale not so woeful – stations on-air up, logs line-ball

Roger Harrison VK2ZRH

There was a big boost in stations participating in this year's event compared to 2015, a total of 126 this year versus 98 last year, a rise of almost 29%. However, the number of stations submitting logs was line-ball, at 38 this year and last. Strange.

> And after Summer, evermore succeeds
> Barren Winter, with his wrathful nipping Cold...
> – *William Shakespeare, King Henry VI*

Once again, the number of VK5s getting amongst it was low – four submitted logs (versus five in 2015). It seems VK3s are made of sterner stuff, with 20 log-submitters going at it hammer and tongs (well . . .), which is one down from 2015. More VK2 stations submitted logs this year – OK, one more – seven versus six last year. Still, it's progress.

The Division 1 versus Division 2 split of logs was a bit of surprise; 86.8% of all logs were submitted for Division 1, while 55.3% of all logs were submitted for Division 2. A healthy 19 stations submitted logs for both divisions (having an each-way bet!). Of the 126 total stations participating, 19 stations did not submit logs, despite having made at least 10 contacts, Mike VK3AVV reports. It would have been really good to receive some logs from the 88 stations that participated, but didn't upload logs. Looking back over the years, it was ever thus. Sigh.

The total number of contacts for the 2016 event reached 3238, which is 89 up on last year's Field Day. Curiously, the number of contacts that could be checked was lower this year, at 55%, compared to the 2015 Field Day, at 61%. Digital operation has returned, with Hilary VK2IUW submitting logs for both Divisions.

The Single-band and Four-band sub-categories have proved popular across both Divisions. Portable operators showed a preference for Single-band, while Home stations generally preferred the Four-bands sub-category. Strategy in application!

The standout portable station was undoubtedly VK3KQ, fielding all bands from 50 MHz through 10 GHz, entering the multi-operator 24 hours category, achieving 4084 points in Division 1 and a monstrous 90,715 points in Division 2!

One hardy wild colonial boy entered the 24 hours Rover station category, Justin VK2CU, who managed to activate 10 grid squares in Division 1, using all bands from 50 MHz to 76 GHz, and achieving 12,488 points.

Accolades

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

This time, the top-scoring Foundation station moves to VK2, with Doug Tufrey VK2FMIA picking up this one. Doug entered the Division 2, 8 hour Home station section, using 2 m and 70 cm to rack up a respectable 3977 points.

On logs and logging

Mike VK3AVV, who developed and runs the log-checking software, reports that there was a marked and welcome improvement in the quality of logs submitted for this Field Day. All logs were in VKCL format and were easy to use with the log-checking software.

There was a marked and welcome improvement in the logging accuracy this year, Mike said. There were only four entries with not-in-log errors (12 last year). One log had callsigns copied incorrectly (10 last year), 16 had exchanges copied incorrectly (57 last year), and one entry had cross-band contacts (10 last year). No one logged a band incorrectly.

Even time-stamping of contacts was much improved, Mike observed, only eight falling outside the limit of 10 minutes time difference. Internationally, the allowed difference is sometimes only plus-or-minus three minutes.

Any suggestions on how to improve or make easier the log-uploading process are welcome.

Mike ended his notes with a curious observation: there were two logs, one of 20 contacts and the other of 30, in which not a single contact was able to be cross-checked. "Interesting, but probably not useful", Mike said.

Determining future VHF-UHF Field Day dates

In Australia and New Zealand, the seasons have defined dates, as set out in Table 1 (1).

Table 1.

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
1 September – 30 November			1 December – 28 February			1 March – 31 May			1 June – 31 August		

The three VHF-UHF Field Days, of Summer–Winter–Spring, have been held on various dates that have differed over the years, e.g. to avoid clashing with other events, rather than any calculable method. Each event has always been held in the same month: January for the Summer Field Day, June for the Winter event, and November for the Spring event.

The Summer event began in 1989, held over the Australia Day weekend in January that year and through 1990-91 (4). In 1992, it was moved forward to 11-12 January, in part to coincide with the last weekend of the annual Ross Hull Memorial VHF-UHF Contest. Since then, the event has been held as early as 9-10 January and as late as 17-18 January (4).

The Spring event was first held in 1998, over 14-15 November (4). This falls late in Spring, chiefly to take advantage of improving weather at this time of year and with it, improving propagation conditions (although, in a few notable years, atrocious weather prevailed). The Spring event has been held as early as 1-2 November and as late as 28-29 November, just days before the official start of summer (4). When held this late, the Summer event may be only 6-7 weeks hence.

The Winter event was introduced in 2008, running over Saturday 21 and Sunday 22 June (4). Sensibly, the event was 'tied' to the June solstice and event dates have varied the least. The solstice that year was on 21 June (1). In 2009, the solstice fell on the Sunday of the event. Since then, the event has been on the weekend falling closest to the solstice, twice in the weekend before the solstice (2010 and 2011), and since then on the weekend following it (4).

Generally, then, the weekend of the event has been the third weekend in June. But, if the June solstice falls on a Wednesday, what then? In 2017, the solstice falls on a Wednesday. And again, in 2023, 2034, 2040, and so on (2, 3). Will there be VHF-UHF Field Days in seven years' time, or beyond? Never mind. That's a question to answer further down the log.

Algorithm to determine future VHF-UHF Field Day Dates

Winter:

(a) When the June solstice is on a weekday (Monday through Friday), the weekend *following* shall be the weekend of the event.

(b) When the June solstice falls on a Saturday or Sunday, *that weekend* shall be the weekend of the event.

Spring – Summer:

(c) When the December solstice falls on a **weekday**, count back four weekends into November and **that weekend** is the Spring event; count forward four weekends into January and *that weekend* is the Summer event.

(d When the solstice falls on a **weekend**, that weekend **is not** counted – count back four weekends into November and *that weekend* is the Spring event; count forward four weekends into January and *that weekend* is the Summer event.

Determining the Spring and Summer events this way places them seven weeks apart in most years; eight weeks apart in years when the solstice is the 22nd and on a weekend. This enables the contest manager sufficient time to receive logs, prepare and publish results for the Spring contest, mindful that the Christmas-New Year season falls in this time; the break also allows sufficient time for Spring contestants to submit logs, recover, regroup and prepare for the Summer event.

Development of the algorithm is set out in a paper posted on the VUH-UHF Field Days page on the WIA website, at: *http://www.wia.org.au/members/contests/vhfuhf/*

2016 Spring Field Day dates

The Spring 2016 event, determined by the method described, is thus on **26-27 November**.

Table 2 lists the dates of all solstices and the forecast dates for VHF-UHF Field days for 2017 through 2020 using the algorithm described.

Year	**Summer**	**Winter**	**Spring**	Year	**Jun** Sol.	**Dec** Sol.
2017	14-15 Jan	24-25 Jun	25-26 Nov	**2017**	21	21
2018	13-14 Jan	23-24 Jun	24-25 Nov	**2018**	21	21
2019	12-13 Jan	22-23 Jun	23-24 Nov	**2019**	21	22
2020	18-19 Jan	20-21 Jun	28-29 Nov	**2020**	20	21

Table 2. Forecast dates for VHF-UHF Field Days to 2020. June and December solstice dates are listed to the right.

The multi-operator VK3KQ station deploys rigs for all bands from 50 MHz through 10 GHz.

Future Field Day rules

Monitor the VHF-UHF Field Day website page (www.wia.org.au/members/contests/vhfuhf/) for an Options Paper for consultation to have your say on the rules for future events.

Acknowledgements

Once the consultation process on future rules is completed, I will step down as "Interim Contest Manager" and pass the baton to another volunteer.

I would particularly like to thank Mike Subocz VK3AVV enough for his determined efforts 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 log-checking software.

In addition, thanks are also due to Michael Binz VK3ALZ and Colin Hutchesson VK5DK for their work in reviewing the results and in helping with the adjudication of problem entries.

These results, including a full table of all entries and scores, are also published on the VHF-UHF Field Days website.

References

1. *https://museumvictoria.com.au/discoverycentre/infosheets/planets/the-sun-and-the-seasons/*
2. Solstices and Equinoxes: 2001 to 2100 Greenwich Mean Time, at *www.astropixels.com/ephemeris/soleq2001.html*
3. Google – e.g. 'what day is June 21 2019'
4. *http://www.wia.org.au/members/contests/vhfuhf/*

2016 Winter VHF-UHF Field Day Results Summary

Division 1

Section A1. Portable station, single operator 24 hrs	
Four-bands: Lou Blasco VK3ALB	269 points
All-bands: Matt Hetherington VK2DAG	10,438 points
Section A2. Portable station, single operator 8 hrs	
Single-band: Peter Parker VK3YE	273 points
All-bands: David Scott VK2JDS	5233 points
Section B1. Portable station, multi-operator 24 hrs	
All-bands: Damian Ayers VK3KQ	4084 points
Section B2. Portable station, multi-operator 8 hrs	
No logs submitted.	
Section C1. Home station 24 hrs	
Four-bands: Bernard Petherbridge VK3AV	1176 points
All-bands: Peter Forbes VK3QI	1857 points
Section C2. Home station 8 hrs	
Single-band: David Rolfe VK3JL	285 points
Four-bands: Michael Hyderiotis VK3MHY	467 points
All-bands: Ross Keogh VK3MY	911 points
Digital: Hilary Bridel VK2IUW	43 points
Section D1. Rover station 24 hrs	
All-bands: Justin Lavery VK2CU	12,488 points
Section D2. Rover station. 8 hrs	
No logs submitted.	

Division 2

Section A1. Portable station, single operator 24 hrs	
All-bands: John Ross VK5NI	1020 points
Section A2. Portable station, single operator 8 hrs	
Single-band: Marcus Bergland VK3TST	2168 points
All-bands: Gavin Brain VK3HY	9009 points
Section B1. Portable station, multi-operator 24 hrs	
All-bands: Damien Ayers VK3KQ	90,715 points
Section B2. Portable station, multi-operator 8 hrs	
No logs submitted.	
Section C1. Home station 24 hrs	
Four-bands: Bernard Petherbridge VK3AV	16,164 points
All-bands: Gerard Sexton VK3CG	16,755 points
Section C2. Home station 8 hrs	
Four-bands: Michael Hyderiotis VK3MHY	4024 points
All-bands: Doug Hunter VK4ADC	3826 points
Digital: Hilary Bridel VK2IUW	2236 points
Section D1. Rover station 24 hrs	
No logs submitted.	
Section D2. Rover station. 8 hrs	
No logs submitted.	

Top-scoring Foundation station operator:

Doug Tufrey VK2FMIA. Division 2, Section C2 Home station 8 hrs, *Four-bands:* 3977 points

ARISS mainstay steps down

Jim Linton VK3PC

Tony Hutchison VK5ZAI standing in front of his wall of honours. Photo by Jill Hutchison.

The fantastic job done by the **Amateur Radio on the International Space Station (ARISS)** Coordinator in Australia, Tony Hutchison VK5ZAI, is coming to an end with his retirement.

During his involvement over more than two decades dozens of contacts were made with the orbiting International Space Station, mainly with Australian and New Zealand schools.

Tony VK5ZAI said: *"Working with schools and students and enjoying every minute, it was a big decision to make."*

Due to several family health issues he has decided to step down from the position at the end of August, and hand the baton to fellow telebridge Shane Lynd VK4KHZ.

Although deciding to travel with his wife Jill and work a little HF on the way, the intention is for Tony to back-up as a telebridge operator from his satellite ground station at Kingston in southeast of South Australia, when needed.

"Both Jill and I have made many great friends over the 23 years we have been involved with bringing space linkups into schools for students; firstly from MIR station and now from the International Space Station," he said.

His involvement began in 1993 by assisting South Australia's Loxton High School students talk with Cosmonaut Alex Serabrov on the MIR space station.

In 1998, Tony handled most of the communications between Australian-born Astronaut Andy Thomas VK5MIR and his family during his flight on MIR, and the rest is history.

He has continued that work over the years through NASA, ARISS and AMSAT. In March 2008, NASA gave him the Group Achievement Award for outstanding engineering support in facilitating amateur radio communications with orbiting space stations.

The NASA ARISS award was received at the Johnson Space Centre in Houston. At the time a humble Tony VK5ZAI said he didn't know that he really deserved it.

"Like all of us I guess, I'm just enjoying the hobby and like giving back a little of what others have given me over the years. I didn't really expect any award for it."

"I think the most rewarding part is to see the excitement on students' faces when they first hear the crew on the ISS reply to an ARISS call," he said.

For his valuable contribution and ongoing ARISS work, the Wireless Institute of Australia (WIA) named Tony as its Chris Jones Award recipient on 2 May 2009.

In 2013 he received an AMSAT North America award for the voluntary work he has done for the ARISS program. In acceptance, Tony VK5ZAI said it was a very nice honour which made him feel humble.

"I look at it as a combined effort for all those that have helped over the last 20 years because I couldn't have done it alone," he said.

The retirement has been made known throughout the world and instantly received congratulatory messages, including one from Frank Bauer KA3HDO, the AMSAT Vice President for Human Spaceflight Programs.

Frank KA3HDO said: *"Your leadership and support to ARISS has been exemplary. The best! I thank you for all you have done to*

make ARISS such a phenomenal program. I will miss your leadership."

"On behalf of the team, we are glad you will be around to help transition Shane VK4KHZ into his new role (as Coordinator). He has big shoes to fill!! And we are happy that you will continue to help ARISS as you can."

In January 2010 Tony took on a six month appointment as international operations leader for ARISS. In that same year he was a finalist in the Australian of the Year Awards, as one chosen in the senior category in South Australia.

That program by the National Australia Day Council recognised his community work including being one of the nine approved Satellite Earth Stations, that through link-ups with schools stimulated the interest of young people in science and technology.

The WIA President, Phil Wait VK2ASD, echoed the congratulations and acknowledged the enormous contribution Tony has made, mostly behind the scenes.

He said through his dedication, patience, and skill, this quiet achiever has coordinated that link via Amateur Radio between numerous school groups with astronauts, leaving the youngsters, the teachers and parents with an occasion to be treasured.

Phil VK2ASD said: *"I will always remember one such occasion that put ten students from the Trinity Christian School in touch with the astronauts as part of the WIA Centenary Dinner in 2010 attended by 200 people."*

"The audience including international guests, Australian Communications and Media Authority Chairman Chris Chapman, and WIA Centenary Patron Dick Smith VK2DIK, was awestruck during the contact."

The Year 12 students asked Astronaut and Flight Engineer Tracy Caldwell-Dyson KF5DBF, on assignment on the space station, a series of questions.

Tony VK5ZAI was present at the controls in Canberra for the contact on Saturday, 29 May, 2010, made possible by a telebridge provided by ON4ISS in Belgium operated by Philippe Van Houte ON5PV.

Tony VK5ZAI from his satellite ground station later appeared in an interview by the Channel 7 Today Tonight show in April 2012, provided some great insights as to how amateur radio can provide support for NASA, as well as raise public awareness through the ARISS schools program.

Channel 7 program video: *http://www.southgatearc.org/news/january2013/australian_given_an_amsat_accolade.htm#.V6lG9zWgYlI*

Australian of The Year finalist report: *http://www.wia.org.au/newsevents/news/2009/20091116-1/index.php*

Over to you

Project VK9NA

The VK9NT team have visited John Anderson VK9JA a couple of times. He is a long-time resident of Norfolk Island and one of the four resident radio amateurs on the island, none of whom are particularly active these days.

John VK9JA, once the local Yaesu dealer back in the 1980s, is now more or less retired.

John was kind enough to present at the WIA AGM Saturday Forum about the significant contribution Norfolk Island had to World War 2 with details of the radar site on Mt Bates.

The VK9NT team visited John in May this year and installed a new antenna for him. It's a Rippletech TZ-CCF-40 SOTA CCF dipole, including 25 m of RG58 coaxial feedline (http://www.http://rippletech.com.au/). This antenna is well constructed with a 4:1 Balun, stainless steel fittings and hardware and should last for many years in the subtropical environment of Norfolk Island.

A quick check with the trusty FG-01 antenna analyser showed low SWR on most HF bands from 40 m to 10 m, with a reasonable match on 6 m. More surprisingly was an SWR of about 1.6:1 at 3.6 MHz, so John will now have opportunity to work most of the HF bands again.

A quick chat indicated that John's trusty FT-901D had suffered from a power supply PCB failure and we've just posted him some replacement HV capacitors for a possible repair.

Seeing the predicament John was currently experiencing, the VK9NT Team felt it would be in the best spirit of amateur radio to see if we could arrange a more up-to-date radio for John's radio operations.

After some discussions with John, we decided the best value rig that was currently available (within the budget) turned out to be an FT-920. One was quickly sourced from the popular VKClassifieds site (http://www.vkclassifieds.net.au/).

Some quick emails and only a few days later, said FT-920 has arrived in VK3 for inspection of testing before shipping off to Norfolk Island.

This is where the VK9NT team is asking for your support.

We are asking the global amateur radio community to help fund Project Norfolk VK9JA to get John back on air.

The costs are: FT920 / Power Supply and freight to VK9JA @$900, Rippletech CCF @$100.

Total is AUD$1000.

Any donations (no matter how large or small) towards this project will be most graciously accepted.

VK9NT team leader, Chris VK3QB, will be managing the accounts via his PayPal account (ease of use and low fees). The team will provide full disclosure of all monies received.

All donors (unless anonymity is requested) will be listed on the VK9NT website and Facebook page (http://vk9nt.odxg.org/)

Please send your donation via PayPal to vk3qb@hotmail.com and note your callsign. Once AUD$1000 is reached, the request for donations will close and any excess donations will be returned to those donors.

Regards,

Team VK9NT: Chris VK3QB, Luke VK3HJ, Brenton VK3YB, Allan VK2CA, Lee VK3GK

ALARA

Christine Taylor VK5CTY – Publicity Officer

Have you applied for an ALARA Award?

If you made the right number of contacts with YL amateurs during the Remembrance Day Contest and/or the ALARA Contest you can apply for the very colourful ALARA Award. It makes a pleasant addition to your Brag Board.

Everyone can apply for an ALARA Award, not only members of ALARA. If you are a VK or ZL amateur you need 10 YLs from at least four call areas. If you are a DX amateur you only need five YLs from at least three call areas. The certificates cost only AUD$5 or 4 IRCs.

The Awards Custodian is Marilyn VK5DMS Unit 14/142 Marian Road, Glynde 5070 SA.

ALARA'S annual birthday

July 25th in 1975 was the date ALARA started so every July we have a Birthday Luncheon. Last year we had a big party to celebrate 40 years in VK3 where we originated but this year it is much quieter.

This year, VK3 met at the Sports Club in Tooradin for a delicious birthday lunch followed by a yummy birthday cake. Only 11 ALARA members and OMs were able to attend and we send get well wishes to those not so well at the moment. Next year, VK3 will be celebrating back at the Retreat Hotel.

In VK5 we celebrated on July 31st at the Flagstaff Hotel on South Road. There were 14 YLs and OMs present and a good time was enjoyed by all, with some 'catching up' with the members who cannot meet during the week.

Birthday Net

An ALARA Birthday Net was held on EchoLink on Saturday evening, with 13 joining in. Happy Birthday, ALARA.

Photo 1: VK3 ALARA Birthday Lunch: L to R rear: Charlie VK3ZD, John VK3DQ and Mike VK3KTO. L to R front: Naree VK3-A, Cheryl VK3FCYL, Margaret VK3FMAB, Denis VK3BGS, Kaye VK3FKDW and Jean VK3VIP (photo courtesy John VK3DQ).

Photo 2: VK3 President Jean cutting the cake: L to R rear: Kaye VK3FKDW, Cheryl VK3FCYL and Elsie. L to R front: Naree VK3-A, Margaret VK3FMAB and Jean VK3VIP (photo courtesy Denis VK3BGS).

Photo 3: VK5 ALARA Birthday Lunch: L to R- Deidre, Myrna VK5YW, Jean VK5TSX, Shirley VK5YL, Meg VK5YG, Marilyn VK5DMS and Christine VK5CTY.

Monday Night Nets

The experiment to have some of these regular nets on EchoLink has worked very well. EchoLink allows those without aerials to participate in the friendly nets. On the first Monday of each month the Net is exclusively on EchoLink, but on the third Monday Shirley manages the combined 80 m and EchoLink net. On the second and fourth and the occasional fifth Monday 80 m is used alone.

Photo 4: VK5GAL who came to share the day with us. (Made by Meg)

The frequency we use is 3.570 MHz +/- if there are other stations using the frequency. If you don't hear anyone at 10.30 Zulu in Winter or 10.00 Zulu in Summer, we won't be far away.

News from Dayton Hamvention

If you are ever in the US in May, as an amateur you should go to Dayton, Ohio and participate in the biggest amateur 'convention in the World'. There are technical talks and technical stalls. There is a Swap section - there is really something for every 'ham' including an YL Forum.

This year one of the features of the YL Forum was the talk by Carole WB2MGP. Carole has been introducing school students to amateur radio for over 30 years. She calls the classes 'enrichment classes' not licence classes. In these lessons she emphasises how amateur radio is related to other subject such as Geography and Social Studies. To be able to talk to someone in a country you are studying makes it so much more real.

While at Dayton, Carole was asked to allow someone else to speak during her talk. It was Doug Wheelock, one of the US astronauts with whom many of her students had spoken to while he was in space. Doug had dressed up in his full space outfit for the occasion. There were quite a number of young amateurs in the audience as Carole also runs sessions for them at Dayton, who were thrilled to see Doug in the flesh.

New member

Recently we had a new YL come up on the 80 m net. Rosie has an interesting story to tell.

From Rosie: *I'm Rosie VK2FRJP and here is a little about myself. First of all I think ALARA is a wonderful group. I like being part of a net and also enjoy talking to other YLs on EchoLink. I was very proud when I got my amateur radio Foundation licence as I have had a learning disability since second grade. My partner is Stephen VK2FHSR.*

Eight years ago the doctors found I had breast cancer. They operated and removed the cancer, then I was given chemo and radiation therapy as usual. However, unfortunately the chemo gave me a stroke that affected our lives from then on. But I'm a fighter. We have been very involved in fund raising in various cancer support groups that gave respite to families, to give them, and their terminally ill relatives, a break from each other.

Photo 5: Rosie in the radio shack.

I have had my own radio show since 2009. Starting at midday every Saturday, the two hour Super Saturday Show with Rosie Parkinson and Stephen is on Highland 107.1 FM. Music is the old 60s hits that we love but don't hear any more. It's broadcast all over the world and I receive emails from many countries. I usually get up to ten thousand local listeners and when we are in public, people recognize my distinctive voice.

I have been an active member in CWA since 2000, participating in Relay for Life as vice- captain for my CWA team and broadcasting live interviews from the ground. My never give up attitude keeps me thinking of, and helping others.

73 Rosie VK2FRJP

Thanks Rosie and welcome to ALARA.

The story of Merle Taylor

In a newsletter from a YL group in South Africa we heard about a YL who taught classes of airmen Morse code, during WW2 in just the way Mrs Florence McKenzie did in Australia.

The YL concerned was Merle Taylor. She did not have an amateur callsign but she learned Morse code to 23 wpm, so she could become a WOG wireless operator ground after seeing the lovely blue uniforms they wore!!

The airmen in Merle's classes were from all over the world and were an essential part of the War.

Merle has a very special souvenir of those days. During a stint in prison for being found playing poker her OM built her a radio with an "M" across the speaker. She eventually gave the radio to her landlady and was thrilled, 35 years later when her landlady willed the radio to her. It is a treasured possession for her now that she is in her nineties.

You can learn more about Merle at: http://elinorflorence.com/blog/merle-taylor-morse-code

The page includes many photos, including Merle's radio from both front and rear.

33

Christine Taylor VK5CTY

SOTA & Parks

Allen Harvie VK3ARH

As we are well and truly into winter, SOTA and Park activations have certainly slowed down, as expected. It is currently a challenging period with poor propagation and harsh weather conditions.

That's not to say there has been no activity: just the die-hard desperados.

VK3ARH SOTA Activation VK3/VT-031 & VK3/VT-032

There was a low event coming across the state with snow down to 1000 m. The predictions were for the weather to improve Saturday but it was going to be wet due to the amount of rain over previous days. It is winter, so you have to expect a challenge and to get wet and be cold. I had not been out for a while so I decided to activate two summits in the foothills of the Alpine National Park. These summits had been on my list for a while as they had only been activated by Wayne VK3WAM over 2.5 years ago. They are both around 1000 m and located on a 4WD track (Mt Margaret Track) which runs along the ridge line parallel to Mt Tamboritha; expecting a challenging but comfortable activation.

As I was getting ready to leave the day before, I saw Peter VK3PF was in my area activating local SOTA summits in less than desirable weather.

Here is Peter VK3PF activating VK3/VC-018 in the hail. Although he is sitting under the gazebo, it did not really help – the rain & hail was being blown horizontally! After a quick chat with Peter, I headed off driving up the night before to camp near the Wellington River thus ensuring an early start.

Next morning a quick inspection of the Mt Margaret 4WD track confirmed my decision not to attempt to drive up the ridge line but to walk in using the Mt Margaret Walking Track. This track is further down Tamboritha Road and a route to Lake Tali Karng.

So early Saturday morning I was on site and prepared for a full day in the Australian bush. The track has not been well maintained but is quite usable. The walk through the scrub cost me my sun glasses, pack cover and I nearly lost my Spot device. Losing a GPS in the area would be an issue but losing the ability to raise help in an area with no phone coverage could be life threatening. In the end it took nearly three hours to cover 5 km on the walking track.

I was relieved to make it to the 4WD track on the ridgeline. Once on the 4WD track, I dropped my pack and took the FT-817 and tuned end-fed for the 800 m climb to Mt Margaret VK3/VT-031 to activate. It was a quick activation. Propagation has been poor but I was able to comfortably qualify the summit.

By now I was two hours behind schedule and whilst the weather was not bad, it was not improving and I like to be back at the car before dark. Could have just followed the walking track back out but I obviously had not found the best way up, so no reason to believe navigating in the dark was going to be easier. Following the 4WD track out would ensure I picked up the second summit. It was going to be longer (about seven km) but quicker travel. Anyway I was here and it would be a long time before coming back so as long as can get safely back to car then why not? Nothing else to do out here.

Given the weather and the time lost deciding to take the longer but safer option following the 4WD track back to the sealed road was the best choice. The 4WD track went through the activation zone of the second summit (VK3/VT-032) thus ensuring two activations and basically a case of keep going.

Walking across the ridgeline was straightforward and presented great views of the Alpine in winter. This is why we are out here. Activated VK3/

Photo 1: Peter VK3PF operating on Mt Buninyong VK3/VC-018.

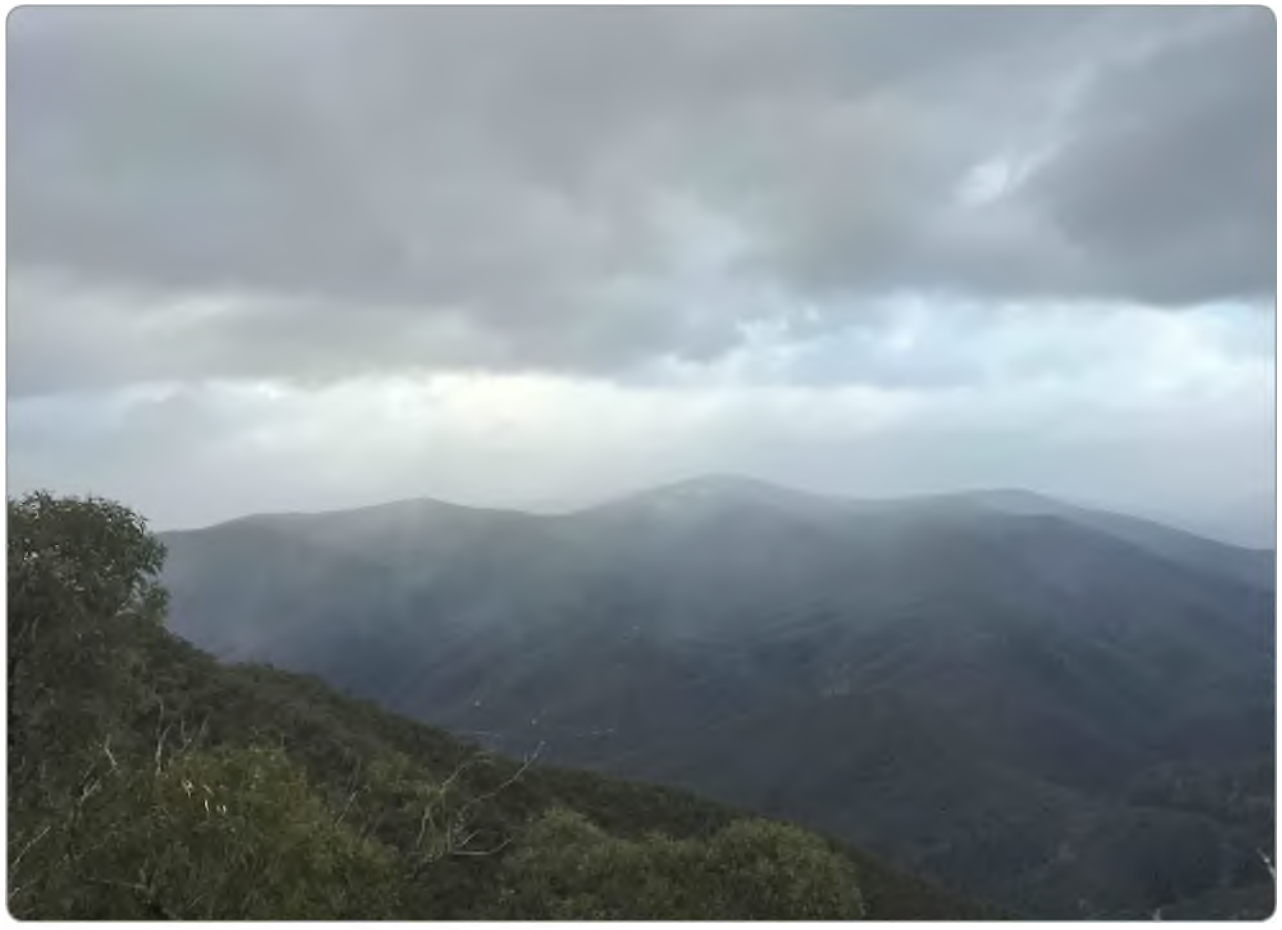


Photo 2: The view from VK3/VT-032 toward Mount Tamboritha.

VT-032 comfortably and continued to follow the 4WD track to walk out to the sealed road.

The 4WD track was very steep on the down side. Got back to the road on dark, so whipped out the head torch and started walking down the road. The advantage of roads is the gentle gradient and clear. Overall it took me 10 hours to cover 27 km gaining 12 SOTA points; a big but successful day.

Winter weather does add extra considerations to activations. Careful planning and quality equipment reduces risk. We have a deep source of experience, so consulting fellow activators as to conditions is prudent.

More reports of wet, snow, successful and otherwise activations

David VK3IL: *http://vk3il.net/mt-loch-mt-hotham-9-july-2016/*

Paul VK3HN: *https://vk3hn.wordpress.com/2016/07/11/return-to-mt-gordon-and-mt-strickland/*

Glenn VK3YY (JP3PBQ): *https://vk3yy.wordpress.com/2016/07/24/mt-fuji-ja-so001/*

Ian VK5CZ: *https://vk5cz.com/2016/07/26/summits-for-july-2016/*

New parks

Paul VK5PAS has taken the time to add 263 additional parks to the VKFF award scheme. The additional parks include marine parks as well as existing parks that missed the initial 2008 cut off. This brings the total up to over 1350 sites in VK - more than enough for everyone.

Upcoming Activities

SOTA Summit: 1 to 3 October. A long Weekend of SOTA and WWFF in the Snowy Mountains National Park. Contact VK2QR *vk2QR@post.com*

The VKFF Team Championship will be held on Sunday 16 October. For more information, go to *http://www.wwffaustralia.com/vkff-team-championship.html*

2016 Keith Roget Memorial National Park Award activation weekend. 11 to 14 November. Contact Tony VK3XV *https://www.amateurradio.com.au/awards*

WWFF Activation weekend 26 to 27 November 2016. Contact Paul *VK5PAS@via.org.au*

Looking forward to improved propagation and for the weather to improve.

73 & 44,

Allen VK3ARH.

VK5news Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

Following the successful lecture about the benefits of magnetic loop antennas Jim VK5TR gave a talk at the Shack explaining the skin effect and its implications.

As it happened, at the members Show and Tell night in July, Geoff VK5ACZ, whose loop antenna appeared under the ALARA notes a couple of months earlier, said that he had noticed a decrease in the efficiency of the antenna as it became covered in verdigris. Interesting!

There were several Show and Tell items that concerned antennas, at that July meeting. The first one was Mike VK5FVSV with his wire antennas. Unfortunately there is no photo but he had made up a case, like those used by photographers, with each antenna in its own winding frame snuggly set in foam. He had a 5 watt SDR radio so he needed a good antenna to improve his reception and transmitting ability. He has a separate antenna for each band, adjusted for best signal using a VK5TR antenna analyser. He uses Anderson connectors which, although they are more expensive, also made a more solid connection to minimise losses. He uses a Link dipole and 22 SWG wire (which he has had to purchase from the UK as there appears to be no wire that size available in Australia).

Steve VK5AIM had a portable dipole created out of two standard vertical car antennas. He can work 80/40 m and the WARC bands on this set-up. They were joined with a balun but it was the upright he specially wanted to show us. He had been wandering around an Op shop when he spotted the base section of a music stand. He happily paid over $5 for the tripod and is pleased that it gives him a solid base on which to mount his twin antennas and it raises them above 'fiddle' height when he uses it for contacts in National Parks etc.

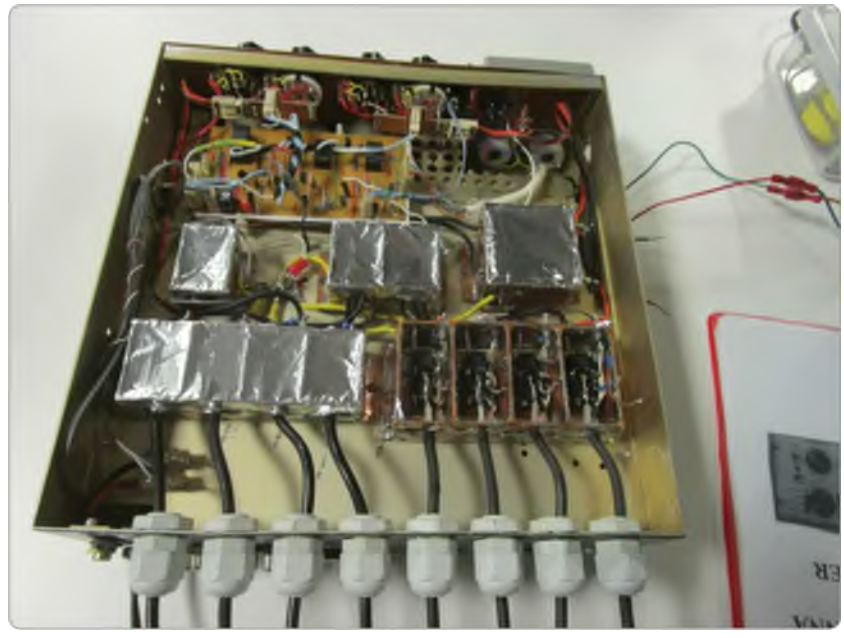


Photo 1: Internal view of Noise Canceller.

Mark VK5AVQ had a tale to tell about the problems associated with driving an old 6-volt VW around the bush when you want to use HF gear that requires 12-volts. He tried many different systems including two 6-volt small solar cells in series to give him 12 volts. But recently he has weakened and bought a commercial power supply for one of the Auto suppliers. This requires a continuous load to work efficiently and a radio does not need this. However, from his touring trips he had a coffee maker he could plug into the cigarette socket (remember those?) so he can always offer you a hot cup of coffee as well if you visit his caravan site. He has just recently been to Maralinga, followed by GippsTech and everything worked beautifully.

Geoff VK5ACZ did not come to show the loop antenna but to show and explain the very detailed noise blanker he has built to go with the antenna. The photo has a large number of controls that, with an SRW meter, make it possible to eliminate each specific noise frequency. The unit they have has a tiny backyard and just happens to be in an area with a very high electrical noise level that is almost impossible to pin down. A noise canceller was the only solution.

Jim VK5TR brought along a plastic front panel to fit on an antenna analyser that he had cut at home using three stepper motors to give him the three dimensions he needs. The motors each feed a very fine screw thread which actually drives the cutters in three dimensions. He did describe the accuracy which is quite mind boggling; of the order of 0.0005 mm.

Arthur VK5AI had a professional commercial receiver from the 1980s that he had repaired and updated. In particular, he is interested in

Photo 2: Redicom radio from the 1980s.

the tuning which, by rewriting the computer language, he has now made to work and to work with a remote control.

Darryl VK5JDS had again been doing the impossible with some old equipment. He came across an old radio exactly like one he had known as a child. The original radio could be used portable with internal batteries or in the car. In the old Vanguard the car connected to the car battery by two metal pegs in the base. Darryl found all the old dry joints and eventually replaced the old capacitors with new ones and we heard it running.

Barry VK5BW and Lyle VK5WL both had power supplies to show us. Barry presented a constant voltage booster / regulator by N8XJK which will maintain a constant 13.8 V to the transceiver as the voltage on the battery slowly goes down with use. This unit has a low voltage cutoff to prevent damage to the battery before it can be recharged. There is no RF interference and is totally reliable.

Lyle had a small box in which he had fitted two transformers back to back which again boosted the voltage to a consistent 13 volts.

Mark VK5AVQ presented a 3.5 GHz transceiver unit made from a commercial point to point link unit, along with another exploded unit for members to examine.

Bill VK5DSP showed us how he was using an SDR dongle, an LNA and a 1.414 Ghz filter to track the Hydrogen Line radiation from deep space and showed some of the results obtained – truly amazing.

There were several other presentations of home brew gear as well. It is incredible the vast array of talents that our members have; running nights such as these are worthwhile and educational for all.

John Moyle Contest Results

AHARS is again on the National scene. We earned fourth place in the HF only multi-operator section for what the operators felt was very bad conditions. Well done everybody!

The Lighthouse Weekend

As well as a group going to Cape Willoughby on Kangaroo Island, another group is planning to activate Cape Jervis. Please listen out for both stations and make some contacts. Check online for details.

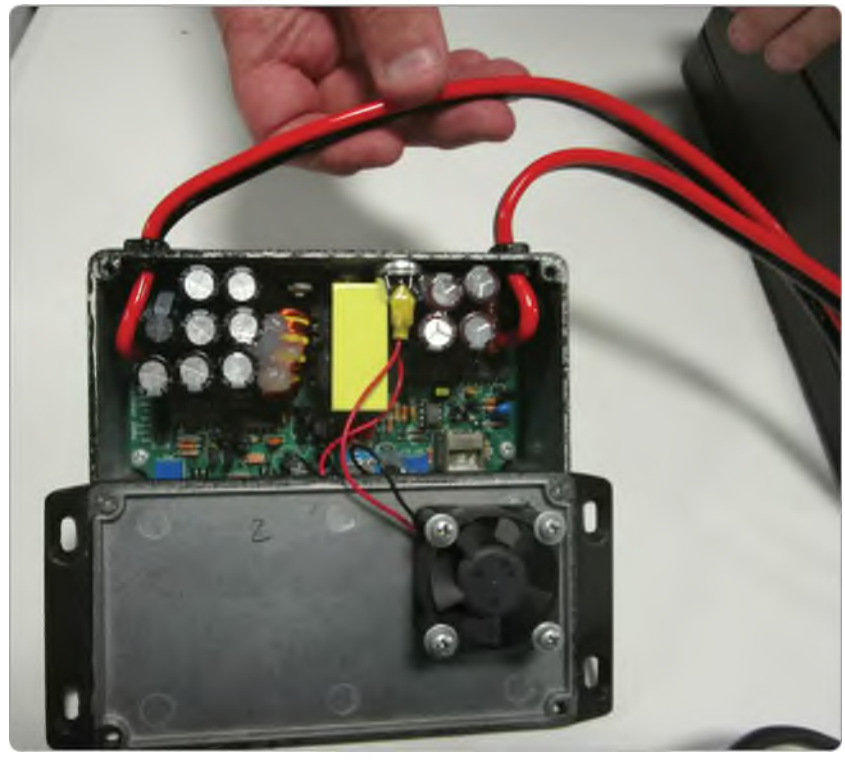
Next Meeting

The next meeting will be visit to the Military Vehicle Museum and we hope it will be well attended. It is a very interesting collection of military vehicles and has quite a number of old radios that will thrill those that remember them.

In September we will have our usual build it yourself evening by Graham VK5ZFZ.

In October we will have a couple of short talks from Patrick VK5MPJ and Brendan VK5FBFB and November brings the Buy and Sell on Sunday 6 November, 2016. If you want a table or half a table please contact Roy on *vk5nrg@wia.org.au* or David on *vk5kc@wia.org.au*

Photo 3: Barry's boost regulator.



DXTalk

Luke Steele VK3HJ

Dreary weather continued for July, as did somewhat subdued conditions on the radio. Solar indices remained mostly low, apart from a rather dramatic burst of activity 21 - 24 July from sunspot R2567. Seven M-class flares erupted, the strongest of which was M7.6, just before the sunspot group rotated off the west limb of the sun. There was also a Moderate geomagnetic storm on earth around this time.

YX0V Aves Island (NA-020). The Venezuelan Navy General Command has invited the Asociación de Radioaficionados de Venezuela to operate from the scientific naval base "Simon Bolivar" on Aves Island. Dates indicated are between 31 August and 10 September, but this could vary. The last announced expedition to Aves Island was cancelled at the last minute, so hopefully this one will go ahead. QSL via W4DTA.

DX heard or worked during July included many of the special event stations commemorating Independence Day and the original thirteen colonies of the new United States of America. Also on air were S79V Seychelles, RI1FJ Franz Josef Land, and a number of Pacific islands, including T2COW Tuvalu, A31MM Tonga, T30AR Western Kiribati, YJ0GA and YJ8RN Vanuatu. Cezar VE3LYC/KL7 was active from the Alaskan island NA-172 Cooper Island.

160 m showed great reluctance in giving us any DX, but some highlights were LU5OM Argentina on 23 July and the next evening CX6VM Chile. A few Americans were worked, but for the most part, signals were extremely weak, and only audible here because of very little atmospheric noise.

September should hopefully see improving conditions as we approach the equinox.

There didn't seem to be a whole lot of activity on 80 m, but 40 and 20 m seemed to offer reasonable conditions. The high bands were not doing much at all. The higher bands should hopefully pick up somewhat as we approach summer.

Upcoming DX

VP6J, Pitcairn Island (OC-044). Japanese operators Nob JF2MBF and Ken JA2FJP will be on air until 3 September, 160 – 10 m, CW, SSB and RTTY. QSL via JF2MBF direct, LotW, OQRS.

Nob and Ken then plan to visit the following islands:

E51Q, South Cook, Rarotonga. 8 - 19 September. QSL via JA2FBY.

E6, Niue. 20 - 29 September. QSL via JF2KOZ.

T2J, Tuvalu. 4 - 10 October. QSL via JA2FJP.

3D2GG, Fiji. 11 - 13 October. QSL via JF2MBF.

VP6AH, Pitcairn Island. Uli DL2AH will be active from 3 September until 25 November. QSL via DL2AH.

Andy VK5MAV will be active from Viney Island (OC-266) in Western Australia, from 9 - 13 September.

5W0BOB, Samoa. 10 – 17 September. Bob VK2BOB is planning a holiday-style operation, on 40 and 20 m SSB, with a Buddistick antenna. QSL direct only.

TO5FP, St Pierre et Miquelon (NA-032). 10 - 20 September. Freddy F4HEC, Nicolas F1RAF, Michel FK8IK, Laurent F5TMJ will be operating from Ile aux Marins. They plan to upload their log to ClubLog daily.

D66D, Comoros (AF-007). 18 - 30 September. A team of several Czech operators plan to operate from 160 – 10 m, CW, SSB and RTTY. QSL via LotW and eQSL, or OK6DJ. For more information see their website. http://www.cdxp.cz/?page_id=512

TZ5XR, Mali. Laurent F5IXR is active from Kidal city, until February 2017 on CW and SSB on HF bands. QSL via F5MXH.

The **San Felix Island DXpedition** originally planned for later this year is now scheduled for March 2017, expanded to ten operators.

5A1AL, Libya. Abubaker is active from time to time from Tripoli. So far, he has not been heard at the author's station, but some equipment has been sourced for Abubaker to hopefully improve his station. Remember, he is operating in very limited conditions, due to the restraints of his accommodation, and the unstable political and security situation in Libya. QSL via W5UE.

Ted Powell Memorial DX Challenge

The Fisher's Ghost Amateur Radio Club is conducting an ongoing DX competition, in memory of Ted Powell, a keen DXer who became a Silent Key in March 2014. Ted had worked 301 entities, and confirmed 300 by the time of his passing.

There are two categories in this competition, Most Wanted, where the objective is to work the most wanted DXCC entity during the award period, and Top 5, where the objective is to work the top 5 most wanted DXCC entities during the award period. In both categories, electronic

certificates are awarded to third place. There are four award periods each year, the current one being 0000 1 July to 2359 30 September, UTC. Most Wanted rankings are based on ClubLog's Most Wanted list, at the beginning of each award period. Entries are to be submitted electronically using the procedure described on the award website, which has full details of this competition. *http://www.vk2au.org/*

QSL Card checking for ARRL awards

There are now three chard checkers in Australia for ARRL awards. These are Laurie VK7ZE, Paul VK5PAS and now Luke VK3HJ. Please visit the ARRL website to familiarise yourself with the procedure for submitting cards and paperwork to be checked. *http://www.arrl.org/dxcc*

Please email me with any DX related news for inclusion in this column. I would be particularly interested in hearing about DX worked or heard in other states.

vk3hj@wia.org.au

73 and good DX,

Luke VK3HJ.

VHF/UHF - An Expanding World

David K Minchin VK5KK

Introduction

Hello again. This month we have yet another mid-winter Tropo opening reported as well as details on the Tropo openings on the Hawaii to California path in June/July 2016. Also some discussion around the proposal for a 70 MHz band for VK! In this month's technical corner we have a new series covering microwave local oscillators as well as Kevin VK4UH's Meteor Scatter report.

144 MHz Tropo report for July 2016

Again in July we had inland Tropo, this time between VK2, VK3, VK4 and VK5 brought about by a massive elongated high pressure cell with a 1030 mB centre. Wouldn't this be nice in the middle of summer! The longest distances spanned were from VK5 (Adelaide Hills) to the VK2RSY Sydney beacon at Dural (QF56mh) on 144.420 MHz. Both Phil VK5AKK (1145 km from PF94ix) and Peter VK5PJ (1111km from PF95mk) heard the beacon between 950 and 1300 UTC on 28/7/2016.

Mark VK2EMA at Tottenham (Central NSW QF37qs) also reported the VK5VF beacon RST 579 (857.5 km to PF95ia) at 2225 UTC on 28/7/16. The next day (29/7/2016), as the system drifted to the east, Mark reported that the VK4RTT beacon peaked to RST 599 (722 km to QG53tc) at 2320 UTC.

The series of mid-winter Tropo openings are an interesting lead up to the 2016/17 Tropo season.

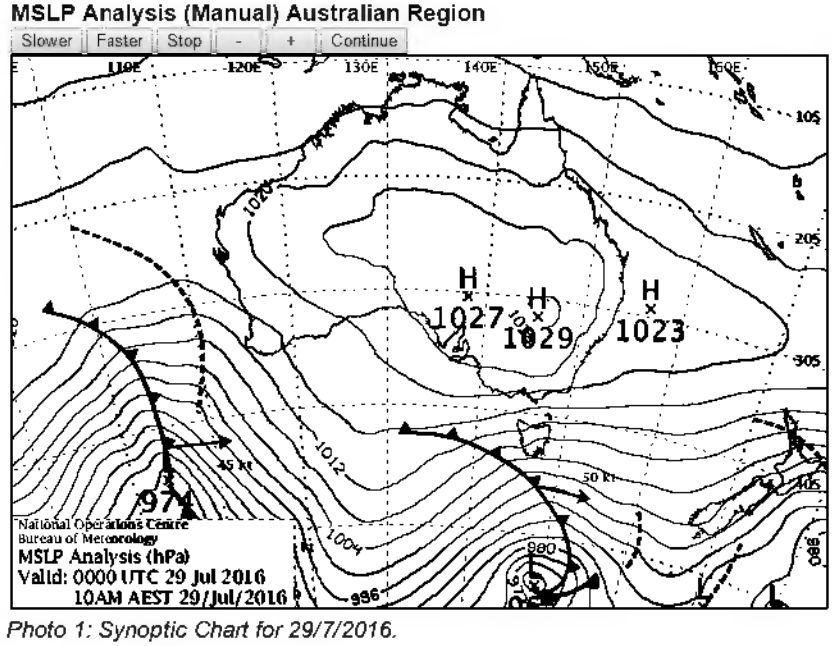


Photo 1: Synoptic Chart for 29/7/2016.

The inland VK2/3/4/5 Tropo path deserves more exploration and perhaps experimentation at higher frequencies given the typical lower humidity over land.

902 MHz New World Record – KH6 to California

Wayne KH6/N6NB has been busy again in a full on effort to expand on the 2304 & 3456 MHz world record

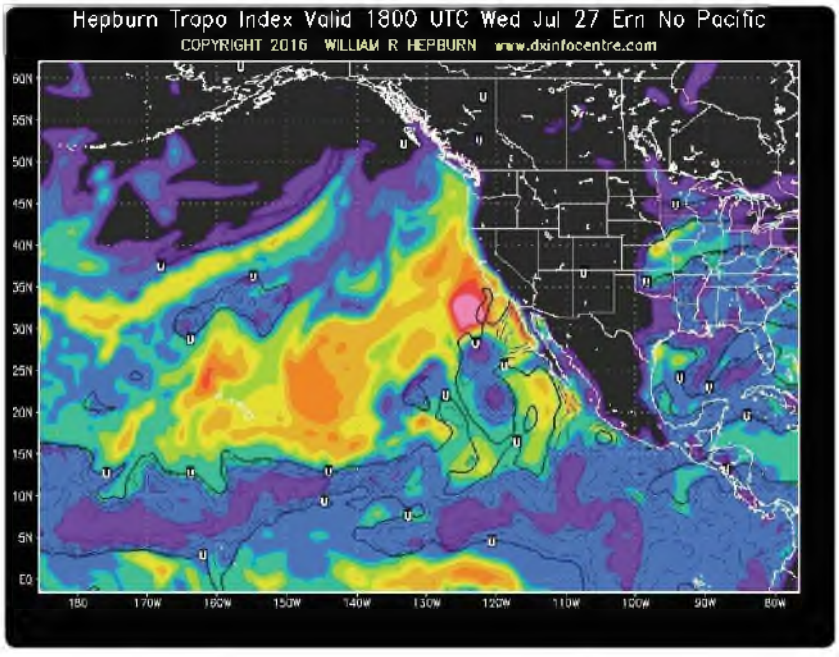


Photo 2: KH6 to California Hepburn chart for end of July 2016.

contacts in 2015 between Hawaii (KH6) and California. Over the June/July this year, Wayne made no less than two trips from California to KH6 to set up his "suitcase" portable rover station in Hawaii. Each trip was initialized at the first sign of an opening, now that's dedication!

Last year N6NB/W6IT achieved contacts on 2.3 & 3.4 GHz but missed out on 5.7 GHz due to WiFi QRM at the W6 end. No signals were heard on 10 GHz in either direction. This year they were faced with poorer Tropo conditions hampered by cyclonic activity at the KH6 end on the last opening. El Nino has now reversed (La Nina) in the NE Pacific, perhaps responsible for the delayed start of the Tropo season similar to what we experienced in our 2015/16 season.

Still on 30/6/2016 at 2333Z, Wayne Ovenbeck KH6/N6NB/P and Greg Campbell W6IT/P successfully worked the Tropo ducting path on 902 MHz to establish a new world record of 4095 Km. From Wayne N6NB ...

"During what turned out to be a very brief trans-Pacific opening, I tried several sites on the slopes of Mauna Loa and concluded that the best site was the same one I used a year earlier (5,000 feet). The higher elevations were in warm, clear weather and the clouds were burning off even there. Meanwhile, Greg took one of the rover stations to an overlook at 6,200 feet elevation on Rim of the World Highway near Running Springs, CA (DM14kf), 75 miles from the coastline but line of sight to it.

Choosing to try to set a DX record from a site so high in elevation and so far inland was admittedly risky. The duct is usually very low on the California end, often only a few hundred feet above sea level. Stations at higher elevations often have far more difficulty working Hawaii than those at low elevations looking into the duct along the coastline. However, as the duct breaks up over land, it's sometimes possible to put a signal into the end of the duct from a high elevation far inland. I was able to work Greg quickly on 144, 222 and 432 MHz. We went to 902 and immediately worked each other with SSB signals running S2 or S3 on peaks, but with deep fading. We continued to work on 902 as we tried higher frequencies--to no avail. It turned out that 902 must have been near the maximum usable frequency over this partly-overland path on this particular day."

A video clip of the record-setting 902 MHz QSO, as recorded in N6NB's rental car, is online at *www.n6nb.com/902clip.wmv*

Of note during the June/July 2016 period was the first use of WSPR over this path. Wilfred KH6IMB and Chris N3IZN had decodes on three separate openings over the 4061km path on 144 MHz. The Hawaiian Club who looks after the KH6HME beacon site are now investigating the installation of a 432 MHz WSPR beacon at the 2400 m ASL site. This site hosts beacons from 50 MHz to 1296 MHz mostly aimed at California. Apparently someone installing a commercial service turned the 1296 MHz beacon antenna to due north at the KH6HME beacon site since the last season, perhaps the explanation as to why it wasn't being heard during the June 30 opening!

For interest I have included a photo of the Hepburn chart for the KH6 to W6 path for 1800Z 27/7/2016. Hepburn was on the money, it shows a clear strong path from mid-California to KH6. The 1296 MHz beacon was audible and quite strong at this time, unfortunately no successful contacts on higher GHz.

70 MHz Band submission to the ACMA

As reported elsewhere in this AR issue, the WIA has approached the ACMA with regard to obtaining a secondary allocation for Australian amateurs in the 70 MHz or 4 metre band area similar to that in IARU Region 1.

Historically access to 70 MHz or 4 Metre band was given to UK amateurs in 1956 as compensation for losing the old UK 5 metre band (56 – 60 MHz) with the expansion of BBC TV operations. Some 30 countries in Europe and Africa

now have some part of the 4 Metre band allocated for amateur use as commercial use has declined. Some larger European countries like Austria, France and Germany amateurs do not have access to the 4 metre band as yet. Population density in these countries is one reason but also because VHF low band is still widely used in rural areas for better coverage (vs. higher VHF/UHF) in forested and mountainous areas. Of interest, in the Mt Gambier area (surrounded by 40,000 Ha of pine forests) the Police, Forestry and various companies still use services in the 73-80 MHz region.

The 70 – 72 MHz section of the land mobile band has/is sparsely used in Australia. This section was not allocated in populous areas to leave a guard band for Channel 2, much the same reasoning we could not use 50 – 52 MHz near a Channel 0 service area. The old Band 1 & 2 TV channels below 143 MHz have now all been vacated and obsoleted with the shutdown of Analogue TV services. There are only 13 land mobile licenses listed on the ACMA database in the 70 – 70.5 MHz range, all of which are in central or northern Queensland. Whilst 70.0 to 70.25 MHz is a LIPD (100mW) there are no current fixed/mobile licenses between 70.250 and 70.450 MHz. So a 200 KHz slice seems at least possible!

Is 70 MHz is an interesting and useful propagation band? Sporadic E works much like 50 MHz. Many will remember channel 2 co service TV interference during good 6 metre openings! TEP is possible and contacts did occur during the last (!) cycle between Europe and South Africa. Unfortunately not much use at this point unless the JARL submits a 70 MHz proposal as well! In Europe the band is also used as an ionospheric propagation indicator for 144 MHz with a fair amount of WSPR and JT65 activity. Tropospheric propagation is almost nonexistent at 70 MHz but extended local coverage over terrain is a bonus.

Equipment wise, 70 MHz has always been an experimenter's band in Europe as there have been few commercial radios available. The new Icom IC-7300 is supplied with the 70 MHz band (50 Watts) in Europe however it is unclear if that is just a simple modification. There are a number of transverter designs but also a lot of low band VHF radios that would normally have been dumped in use! P25 is popular in some parts for local chat networks. And 70 MHz is just within the range of Gen 3 SDR radios so there are some options to play with here as well.

Lets' hope the ACMA views our submission favourably.

The Microwave Local Oscillator!

In SDR series we briefly discussed a few options available for generating "synthesized" frequency agile oscillators. The words "stable", "clean" and "resettable" were used a few times as a requirement for our SDR transceiver but what about the transverter that is going to follow? Microwave transverters all have a local oscillator as their core element, the higher in frequency you go the more complex and critical the oscillator becomes. At the extreme end (122 GHz) the local oscillator is the most complex and expensive part, the transverter may just be a diode on a small PCB in an enclosure.

Stability and resettability are the "X factor" as you go higher in frequency. If you have the X factor under control that just leaves the Y factor (antenna pointing) and the Z factor (being on at the right time) to worry about! All requirements are relative to what you need to achieve but also what is practical!

A slightly drifty signal is a bit of a nuisance on SSB but as long as it always appears within ~1 KHz of where it should be it has a fair chance of being heard. For an example, a 3.4 GHz panel transverters uses as the PLL reference a SMD 10 MHz TCXO with a short term stability of around 0.1ppm, acceptable for SSB and FM. This is about the same stability as can be achieved by a traditional crystal oscillator/multiplier chain with a crystal using a temperature controlled heater (the clip on style).

Unless you are going to use the transverter for digital work you are probably not going to bother upgrading the 10 MHz oscillator in your 3.4 GHz transverter to an OCXO. However try and use the same 0.1ppm stability on a frequency 8 times higher (24 GHz) and it will be almost useless. To improve stability you need to control the operating environment of the crystal reference (whether it be a 10 MHz reference or an overtone oscillator) or use a more stable external reference to control the oscillator. More on that in the next part of this series!

The other word is "clean". By clean I mean not only a local oscillator with a T9 note but one that is relatively free of sideband artifacts and harmonics. In the real world, what may start as a sine wave never looks quite the same when it has been multiplied 100 or more times to reach the final GHz frequency! A high Q crystal oscillator with a low noise voltage rail will still produce a good sine wave but what if that oscillator is a free running VCO inside a small PLL chip with square wave digital control signals all around it? It's not going to be the same, you may achieve a T9 note but with greater noise sidebands than the crystal oscillator.

A good PLL design can be perfectly acceptable for use up well into the GHz region. There are plenty of PLL chip's that have good specifications however the ultimate performance is entirely dependent on PCB layout and environmental issues such as clean power supplies, shielding, etc. A less than ideal PLL can have significant phase noise and spikes at + or – 10 MHz with associated intermodulation products. Try multiplying that oscillator up to 24 GHz or higher and the spectrum with look much like a Christmas tree in a pine forest!

In practice, you may find a strong station that is 50 - 100 kHz wide but is that the station or your own transverter or both?! Another example I have seen a few times on travels is tuning across various beacons. Some

do appear to have significant phase noise despite only being of moderate strength whilst others would be stronger and fairly clean but maybe a bit off frequency. Yes the latter is probably an older crystal oscillator type but some confirmation that my own oscillator is fairly clean!

Clearly it is a bigger challenge for a PLL to be "clean" but again this is all relative to what you need to achieve. In the next few installments we will go through a few options on PLL microwave local oscillators. We will focus on a range of surplus and newer design PLL's as well as re introducing the overtone crystal oscillator 2016 style.

Gippstech 2016

Congratulations to the Eastern Zone Amateur Radio Club for putting on yet another successful Gippstech 2016 conference. The two days of presentations covered a range of subjects from DC to GHz, the quality of which is on par with any overseas conference. Having missed the last ten Gippstech's due to work and other commitments, it was good to catch up with so many VHF and above enthusiasts.

In closing

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

73's

David VK5KK

Meteor Scatter Report

Dr Kevin Johnston VK4UH

Regular readers of this column may remember that, back in July 2014, I reported a "partial" 2 m meteor scatter contact, in July of that year, when British station G4SWX in Woodridge, England (JO02rf) successfully decoded an FSK441 from the Canadian Expedition Station VC1T operating from Pouch Cove Newfoundland (GN37os) at an incredible distance of 3829 km.

VC1T was a special station using high power and a 100-foot-long (30.5 m), 43-element, horizontally polarised 2 m Yagi suspended between two 8 m towers on two parallel lengths of Kevlar cord. The special expedition station was established to try to bridge the Atlantic on 144 MHz in order to win the Brendan award. The Irish Radio Transmitters Society (IRTS), the equivalent of the WIA in Eire, established the Brendan Awards for the first confirmed 2-way contact across the Atlantic, anywhere between "The Americas" and Europe, without the use of EME, satellites or aircraft reflections. To date, despite many attempts with high power and massive antennas, this has still to be achieved.

At the time it was thought that the one-way FSK441 signal received by G4WSX occurred as a result of a combination of Meteor Scatter (MS) and Sporadic E (Es) propagation modes to achieve the massive distance of 3829 km when the practical limit for non-enhanced MS is around 2300 km. Although the received decode of VC1T was confirmed by several others, from the captured audio file, the mode of propagation was not. It was reported in *RadCom* July 2016, the UK equivalent of *AR* magazine, that later analysis from historic orbital flight data, has concluded that this propagation was in fact due to reflections from the International Space Station (ISS) and not from enhanced MS.

As such, even had this contact been completed, then it would still not have met the criteria for the Brendan Awards, since it was achieved by reflections from a man-made structure. It would still however be an amazing achievement and has prompted a series of successful tests looking for ISS reflection propagation. *RadCom* also reported the successful reception of 144 MHz CW signals across the Atlantic from VO1FN (GN37) received by GK4LOH (IO70) in England at a distance of 3467 km on May 2 2016.

For anyone interested YouTube video of the signals is available by searching for "GK4LOH". With some careful planning this mode of propagation could support 2 m contacts from stations on the Eastern seaboard or even ZL, into Perth using ISCAT, FSK441 or another suitable digital mode.

At the recent GippsTech conference in VK3 in July, Rex VK7MO presented a paper on recent developments in the WSJT and WSJT-X software suites for digital AR communications. Much of the recent developments have been towards improvements in digital communications on the higher microwave bands and for EME. There was mention of the new FEC MS mode MSK144 currently under development, as reported in last month's column and also the yet to be released QRA mode. QRA (Q-ary Irregularly Repeated-Accumulate codes) by IV3NWV, it seems, is aimed at HF digital operation offering several dB advantage over JT65 on convolutional decoding.

There is no news at the time of writing of a further release of the MSHV platform supporting MSK144 mode as discussed last month. Hopefully there will soon be a release of MSHV or a further update of WSJT supporting this new mode. A few stations including the author VK4UH and Arie VK3AMZ are continuing to evaluate this new FEC mode from an earlier release. The 6 m MS results look promising.

The next significant Meteor Showers on the calendar will be:

Orionids peaking around 22 October

Leonids peaking around 17 November

Any contributions or MS activity reports for this column are always welcome. I would also like to hear from any stations interested in participating in some 28 MHz MS trials.

The spring is coming.

Dr Kevin Johnston VK4UH

vk4uh@wia.org.au

VK2news

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

We are told it is spring and most of the year is already gone.

At ARNSW this month there is a Foundation training and assessment weekend on 17 and 18 September 2016. It may already be fully booked but enquire by an email to *education@arnsw.org.au*

The final ARNSW Foundation weekend for this year is 19 and 20 November 2016.

On Sunday 25 September 2016 there will be a Trash & Treasure at VK2WI. Waverley ARS also has a Foundation weekend this month.

ARNSW deferred the planned Talk Fest day at the end of August. The next and final for the year is scheduled for Sunday 6 November 2016.

Summerland ARC at Lismore has just held their annual SARCfest after a two year absence due to site works and clubroom improvements.

Manly Warringah RS have their annual flag pole contest on 17 September 2016.

HADARC as part of their 40th anniversary will have a field day at Fagan Park Galston on Saturday the 17th September 2016.

Westlakes ARC have their annual field day at the club rooms on Sunday 18 September 2016.

WICEN NSW has the annual SAREX search for missing aircraft VH-MDX at Barrington Tops from 16 to 18 September 2016.

73 – Tim VK2ZTM.

Review of WARS Power Distribution Box

Martin Luther VK7GN

Some while ago I decided to standardize my power connections using Anderson PowerPoles. They are very good quality and come in a number of different ratings. I mostly use the 30 amp variety which is available over the internet in quantity at very reasonable prices. Just beware of products that are like but not actually Andersons.

Late last year I was contemplating a new connector panel for use at another station location. I was investigating cost of parts and method when I spotted an advert on VK Classifieds (*http://www.vkclassifieds.net.au/*) by the Waverley Amateur Radio Society (*www.vk2bv.org* for a kit of parts to build a small Distribution box.

The price looked right, so I ordered two from the next batch to be made in January 2016.

The service in supply was excellent; I was notified by email when the package was sent. Unfortunately, some LEDs were missing from one kit but an email to WARS soon had them on their way to me by post. (I judge organizations not on whether they make mistakes but on how quickly and satisfactorily they correct the error.)

Photo 1: The kit components and tools used for assembly.

The instructions are comprehensive and should be enough to guide anyone who at least knows how to solder. You will need a good large soldering iron. The pencil iron used for SMD just won't get enough heat into the big lumps of copper. I used my old Weller soldering gun, over 50 years old and still going strong!

Photo 1 shows the tools I used to build this kit. Doesn't require anything sophisticated!

The printed circuit board provided is of excellent quality and fits the supplied box.

I used a sharp knife to cut the rectangular holes in the box with a metal ruler. Worked okay but need to take real care as a simple slip will end up with shortened fingers! Just be very patient. It did provide a clean line that could be brought to accuracy by filing when the loaded PC Board is test fitted into the box.

The provision of two adhesive labels is a nice touch, one can be used for cutting and drilling then the other can be the final face sheet for the finished product.

Photo 2 shows the finished product alongside some bits for number two box.

My only criticism is that the box has a longer cut-out at one end of the connector row. Longer than the cut-out for the fuse row. However, the way the connectors go in, that cut-out is not required or is needed at the other end. Doesn't make any difference to the way it works just an oddity that has probably arrived when going from prototype to finished production.

The box works and I have looked for a voltage drop with 20 amps going through it and can see no problems.

This makes a nice project for a weekend and might tidy up all those DC cables running around behind the equipment! Thank you WARS for making it available.

Photo 2: The completed distribution box together with some parts from the second kit.

Who was GA Taylor?

Phil Wait VK2ASD

George Augustus Taylor was born at Sydney in 1872. He first became known as an artist and cartoonist, and was a member of the Sydney Bohemian set in the 1890s, which included Henry Lawson and many notable Australian artists.

He contributed drawings to *The Bulletin*, *Worker*, *Sunday Times*, *Referee*, and *London Punch*. No doubt he spent time mixing it with some famous Australian characters at Cerlew Camp, the old Sydney artists on the shores of Sydney Harbour just below Taronga Zoo.

He later trained as a builder and became interested in town planning and then shifted focus to technology, and established a factory to make light aircraft. He experimented with a motorless aeroplane (glider) and, in 1909, became the first person in Australia to fly in a heavier-than-air craft. He founded the aerial league in 1909 and urged the Federal government to establish an air force.

In 1905 he was granted one of the first radio transmitting licenses, and was one of the first 10 wireless experimenters to be licensed under the new PMG radio regulations in 1909.

In 1910 he was the founding Chairman of the Wireless Institute of New South Wales which grew in the Wireless Institute of Australia.

An unstoppable experimenter, 1910 and 1911 he succeeded in communicating from one part of a railway train to another, and in exchanging messages between trains running at full speed, and in 1913 he was the first to fire a gun by wireless. With the advent of World War I, he joined the 7th Light Horse and was seconded to the Intelligence Section General Staff for the duration.

He was also interested in town-planning, and published in 1914

Photo 1: GA Taylor.

Town Planning for Australia and in 1918 *Town Planning with Common-sense*. How did he get the time!

Apart from founding the WIA, Taylor also helped found the Aerial League of Australia (1909), the Town Planning Association of New South Wales (1913), the Institution of Engineers Australia (1919), and the Australian Inventions Encouragement Board (1922). Still an experimenter, he continued his pre-war work on proto-television, reportedly achieving colour transmission in the mid-1920s.

He insisted that radio broadcasting should serve the community and not those with vested interests, such as the Amalgamated Wireless (Australasia) Ltd. Taylor visited Europe in 1922 and studied broadcasting developments. On his return at the end of that year he formed an association for developing wireless broadcasting in Australia and was elected its President.

He was publisher of the *Radio Journal of Australasia*, *Songs for Soldiers* and *Just Jingles*, some small volumes of sketches and stories, and (being by that time an ardent patriot and nationalist), weird science fiction which presented technology alone as capable of saving Australia from Germany and Japan.

An epileptic, he died as the result of a seizure in his bathtub on 20 January 1928, aged just 56. A complex man: a short but incredibly full life.

Photo 2: Phil VK2ASD with GA Taylor Medallist Dale Hughes VK1DSH.

VK1news Canberra and Region Amateur Radio Club

Pieter Kloppenburg VK1CPK

The visit by the President of the WIA, Phil Wait VK2ASD, ensured a full house at the August meeting of the Canberra and Region Amateur Radio Club (CRARC). Phil's visit was the first time a WIA President came to visit us in an official capacity. Deservedly so, as two of our members were to be recognised for their services to amateur radio here in Canberra. Phil began by handing the GA Taylor award to Dale Hughes VK1DSH.

Dale is a prodigious technical writer and experimenter in radio communications, particularly in projects close to the heart of radio amateurs. These projects include topics related to antenna controllers, filter design, UHF antennas, and dual channel CAT interfaces, among others. He also a member of WIA committees that deal with international issues related to the use of amateur radio frequency bands. We hope that Dale will continue with his services to amateur radio for a very long time.

The next beneficiary of an award was Gilbert Hughes VK1GH.

Photo 1: Dale Hughes VK1DSH holding his Medal after the presentation.

Gilbert has given much of his time to CRARC as an active member of committees, promoting outdoor activities, and providing maintenance services to the club's repeater equipment at a number of sites around Canberra. In addition to this, he has been a WIA Assessor during the last ten years. For this latter service, Phil awarded him the Certificate of Recognition. Gilbert took the opportunity to talk about the importance of volunteering for the various jobs that go to make the Foundation Course a success and the continuation of amateur radio in Australia.

Phil took the opportunity to talk about the future of amateur radio. With the use of a projector and a white screen, he explained the many problems that lay ahead in the use of UHF bands not only for radio amateurs but also for the increased use by consumers of wireless services such as smartphones, the Internet, broadcasting, and other commercial information services. The existing and newly developed services will put pressure on the amateur bands ranging from 430 MHz to 3.6 GHz and even higher. Phil predicted that household appliances such as washing machines, TV sets, automobiles, etc. would all be equipped with devices that provide system information to governments departments, manufacturers, and service providers. All of which using super high frequencies.

Phil also mentioned that only 31% of Australian licensed radio amateurs are members of the WIA. With only two salaried members of staff providing services to the members, volunteers provide the greatest part of the workload. He said that at year's end a newly designed annual publication would be on sale, containing all the projects that were written up during that year.

Members of CRARC look forward to repeat visits from Phil Wait and hope that more volunteers come forward to help providing services to the Australian radio amateur community.

Photo 2: Gilbert Hughes VK1GH (L) receiving his Certificate of Recognition for 10 years of service as an Assessor from President Phil Wait VK2ASD.

VK3news Geelong Amateur Radio Club

Tony Collis VK3JGC

The Final Frontier

The GARC and the Melbourne Space Program

The University of Melbourne auspices the Melbourne Space Program, which aims to promote education, innovation and technological advancement within the Australian space sector. They seek to establish themselves as a leading space research and development hub, demonstrating what we as a nation can accomplish in space.

They will begin by building and launching their own nano-satellite thereby constructing the second student built satellite in Australia. The CubeSat, which it is hoped will be launched in 2018, will serve as the foundation upon which a multi-disciplinary learning organisation focused on engineering, education, economics and policy related to space activity will follow.

Amateur radio played an integral part in the AO5 program, built by students and launched in 1970. Former members of the GARC monitored the beacon transmissions at that time and reported the information to the controllers. The Club was invited to participate in the Final Frontier Festival exhibition on 1 and 2 July 2016 and a booth was developed by Carlo VK3BCL with information about communication related to areas such as moon-bounce (EME), meteor scatter, OSCARs (orbiting satellites carrying amateur radio) and auroral disturbances. (Barry VK3SY)

Carlo VK3BCL in the GARC booth at the Melbourne exhibition.

(See the GARC VK3 column in the May 2015 edition of the *AR* magazine for the club involvement with NASA's JPL in EME microwave activities).

Members of the MSP spoke at the GARC on 12 August 2016.

The First Australian Amateur Radio Satellite

Australis-OSCAR 5 is an amateur radio satellite that was launched into Low Earth Orbit on 23 January 1970 by a Thor Delta launcher from Vandenberg Air Force Base, Lompoc, California. OSCAR 5 was launched piggyback on a TIROS-M weather satellite. Built by students at The University of Melbourne in 1966, the satellite was powered by a Manganese - Alkaline battery and had two beacons on 144.050 MHz at 50 mW and on 29.450 MHz at 250 mW bands that operated for only 23 and 46 days respectively.

Passive magnetic attitude stabilization was performed by carrying two bar magnets to align with the Earth's magnetic field in order to provide a favourable antenna footprint.

A command system was used to only activate the system on weekends: Friday a.m. to Monday a.m.

Each broadcast began with the letters 'HI' in Morse code and was followed by data from seven different on-board sensors (battery voltage, temperature at two points on the satellite and information that established the satellite's orientation in space).

Several thousand transmissions were logged and formal telemetry reports received from more than 200 observers in over 27 countries.

This was the first amateur satellite to be remotely controlled and the first amateur satellite launch coordinated by the new AMSAT organization.

Due to budgetary constraints, Aussie ingenuity prevailed:

- For their cold soak test they basically used an Esky filled with dry ice and immersed the satellite in it to make sure it would function properly in the cold of space.
- In deference to the limitations of the equipment available to the amateur fraternity, the seven channel telemetry on board used variable frequency audible tones to report Temperature, Battery Voltage, Current and Horizon sensor information.
- The antenna spring release mechanism used specially-made bed springs and the satellite's antennas for 10 m and 2 m were actually cut down Stanley measuring tapes!

The OSCAR 5 satellite itself will continue to orbit the earth for several hundred years.

Phil Shields VK2CPR

Testing APRS for public safety at a public event

From our high country correspondent Phil Shields VK2CPR.

Members of the Lake Hume Amateur Radio Group (LHARG) tested a portable Automatic Packet Reporting System (APRS) base and digipeater which will be used in the upcoming Mt. Bogong 'conquestithon'. The conquestithon, held in early March, is organised and staffed by members of the Upper Kiewa Valley Lions Club. LHARG normally provide a portable voice repeater for communication with check-points around the course. The challenge is to use the voice repeater in conjunction with an APRS digipeater (digi) on 145.175 MHz to track the sweep person, a competitor, and various officials during the event. The event starts from the Mountain Creek picnic area at the base of Mount Bogong and encompasses a 20 km round trip with a climb of 1,300 metres to the summit of Victoria's highest mountain.

Photo 1: Tea at Mountain Creek camp ground with (left to right) Peter VK2CIM, Riley, Shane VK3KHS and Stafford VK2AST.

The hypothesis was simple enough on paper; we planned to track people through deep valleys and lofty summits during the event, all independent of the internet. A portable digipeater on a ridge will report to a base platform in the Mountain Creek valley campground which will place people on a specially constructed map of the area.

Stafford VK2AST and Phil VK2CPR constructed three Argent OT3 mini APRS units. The units act as digis in their own right and will provide a moving 'network' of connectivity over the entire course. The OT3s provide a telemetry output which updates 'real-time' battery voltage and temperature. Phil constructed a digi from an old Paccomm Micro 2 packet controller powered by a newly burnt UIDIGI (1) EPROM. The digi is interfaced to an 'Any Tone' 588 2 metre rig.

Members camped overnight at Mountain Creek ready for the next day. One of the aims of the exercise was to place the digi (VK2AHA-1) in a position so that it can be heard by the wider network and at the same time 'see' the entire course. If an optimum position can be found, our stations will be visible on the *http://www.aprs.fi* global system.

Photo 2: The base APRS platform at Mountain Creek camp ground.

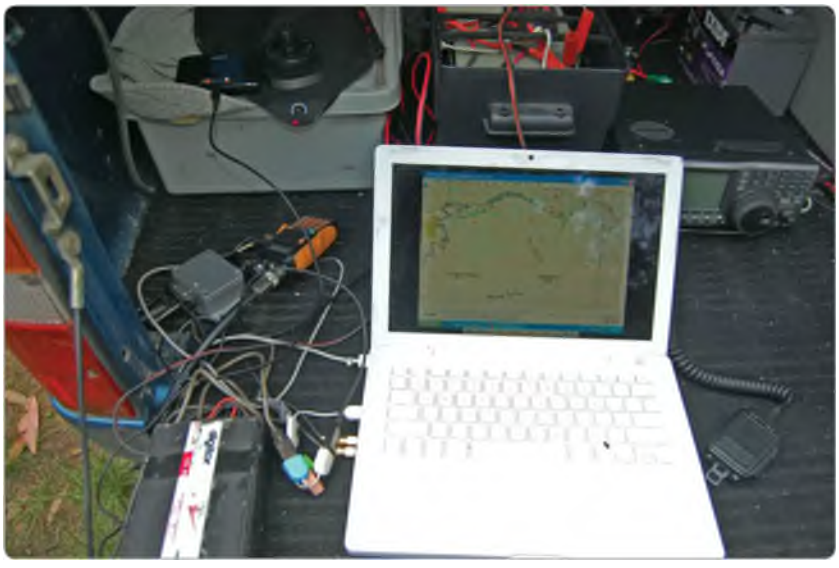


Photo 3: Peter VK2CIM preparing to ascend Mt. Bogong.

The plan was to check three levels on the course. Shane VK3KHS drove along the upper ridge line, Phil VK2CPR 4WD'd in the valley along Mountain Creek and Peter VK2CIM was the hardy soul who volunteered to climb the mountain. Peter constructed an APRS back pack containing a Yaesu VX-8, an MFJ310s window mount to which a Diamond SRH 779 antenna was attached.

Peter was tracked by the digi until he reached sufficient height on Mt. Bogong to be heard in Canberra! We found that there was a 300 metre stretch of track on the ridge line which could be heard by the wider APRS network and mobiles on the course.

The base platform at Mountain Creek was constructed from an Apple MacBook running Oracle's Virtual Box (VB) (2) free emulation software. The APRS software included the UI-View (3) mapping software, UZ7HO (4) sound modem and a home brew interface to a hand held. UI-view maps of the area were made from various maps including a detailed Country Fire Authority (CFA) map. The base antenna was just a simple home-brew collinear. The digi and base platform antennas were slung over tree branches using a powerful ground-mounted slinger, a kind of miniature medieval trebuchet. A small bean bag projectile was successfully launched after a few trial runs. The sling was a team effort; it was hard to aim and required two people, one to steady the frame, and the other to pull the sling back.

We concluded from the tests that the digi will be assured of wider and local network connection if we install a 4.5 dB Diamond X-50 omnidirectional antenna for the 'real thing' in March at the spot on the ridge line. The digi successfully relayed positions from all of the participants to the base map as they progressed along the deep valley, high ridge line and the ascent of the mountain. The day was a success with the entire gear running as expected and many valuable lessons learnt.

Members of LHARG suggested that APRS could be a valuable safety network for public events, or searches, in this wild and challenging terrain.

- *http://www.ir3ip.net/iw3fqg/uidigi-e.htm*
- *https://www.virtualbox.org/*
- *http://uz7.ho.ua/packetradio.htm*
- *http://www.ui-view.net/*

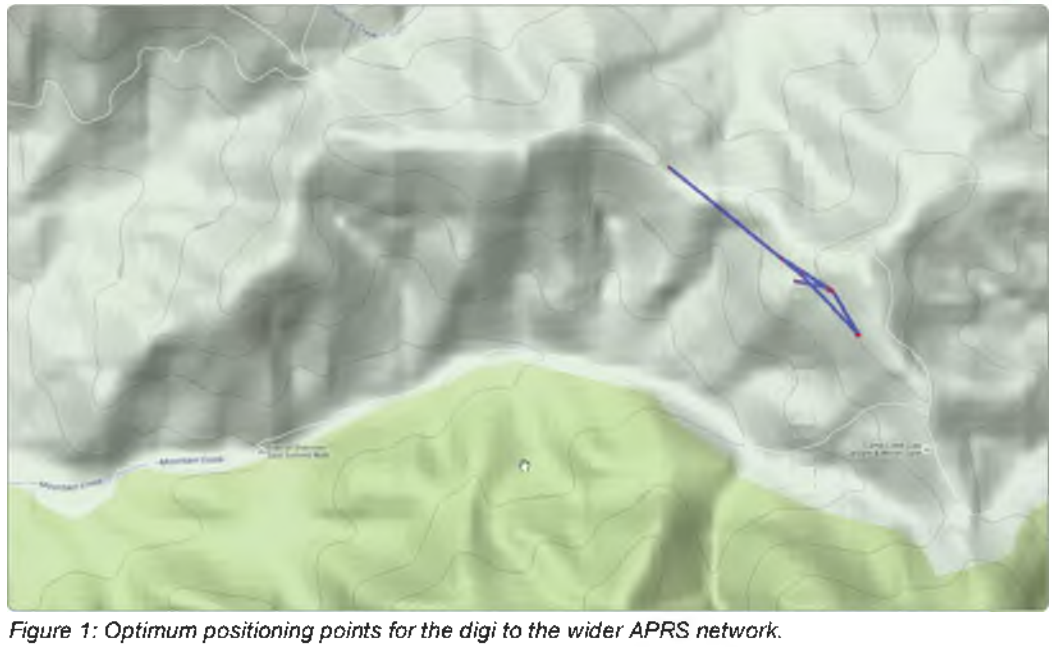


Figure 1: Optimum positioning points for the digi to the wider APRS network.

VK4news BARG

Les Neilson VK4FAEB

Photo 1: Dave Prince VK4KDP with his collection of WWII AWA radios.

On Friday 10 June2016 we had the pleasure of Dave Prince, one of our founding members of the Brisbane Amateur Radio Club, deliver an excellent presentation on the history of AWA radios used for coast watching around Australia and the Pacific during the Second World War.

These radios are just one small part of his collection of military radios and equipment, and yes he is still avidly collecting and would love to find an AWA 3A radio if one does exist. So let him know of any finds you know via his email *vk4kdp@qsl.net* and then check out his webpage too *http://www.qsl.net/vk4kdp/bmrc.html* for more military relics.

Dave brought along his working AWA 3B and 3BZ sets to demonstrate how they actually worked and during the presentation unfolded some important history of the coast watchers who used the sets during wartime in and around Australia.

AWA History

Many Coast Watchers relied for their communications on the Australian designed and manufactured transmitter/receiver outfit, the 3BZ. The 3BZ was the most famous of a series of communications equipment made by the large Australian company Amalgamated Wireless (Australasia), or AWA.

AWA had been formed in 1913 to combine the Australian interests of the Marconi and Telefunken companies and in 1922 the Australian Government took a controlling shareholding. AWA was given a mandate to provide wireless communications across Australia and in surrounding islands, New Guinea, the Solomon Islands and Fiji, etc. where there were numerous widely separated plantations, airstrips, mines and settlements.

By 1940 the Teleradio series had evolved into the model 3A. The receiver and transmitter/tuning unit of the 3A version were separate items, fitted into two rectangular steel boxes. The receiver (AWA Type *C3487) had a straight line dial covering from 105 metres (2.9 MHz) to 13 metres (23 MHz) in two bands plus an LF/MF segment in a third band. There were three models to cover different sections of the LF/MF band between 100-1500 kHz, identified by replacing the "*" with a 4, 5, or 6. The valve line-up of the receiver was a 1C4 RF amplifier, 1C6 oscillator/mixer, 1C4 IF, 1K6 detector/AVC/AF, 1D4

audio output and a 1K4 BFO. The general design for the 3A receiver was based on the newly introduced AWA dual band domestic receivers which featured straight line dials. The transmitter (Type J3908) was a simple unit fitted in another steel case, about the same size as the receiver case. The valves used were a 42 as the crystal oscillator, another 42 as the speech amplifier driving a 6A6 as the class B modulator. The RF amplifier was an 807.

Then in April 1940 AWA made a radical design change and their new 3B equipment consisted of a five band (or four band plus one crystal channel) general coverage receiver (Type *C6770) covering 200 kHz to 30 MHz, a two crystal channel CW and AM transmitter (Type 1J6798), a separate vibrator power supply in a metal case with a speaker included (Type D6799) and a small antenna coupling unit (Type J6847).

The innovative pressed steel cases had rounded corners and strong clip-on metal covers with spring clips to protect the equipment and controls and to ease the rigours of manhandling it through thick jungles. The top covers were also held on by spring clips for quick and complete access to the internal components and the bottom covers secured with 4 screws. The 3B receiver used indirectly heated valves comprising a 6U7G RF amplifier, a 6J8G mixer followed by a 6J8G IF amplifier, a 6G8 2nd IF and detector with a 6V6G audio amp. The main tuning control now incorporated a Muirhead type slow motion drive with a 180 degree scale and 54:1 Vernier.

The frequencies covered by the standard receiver were:

BAND	RANGE (Mc)	RANGE (metres)
A	30 Mc to 9 Mc	10 to 33 metres
B	11.1 Mc to 3.5 Mc	27 to 85 metres
C	4.6 Mc to 1.5 Mc	65 to 200 metres
D	1650 kc to 545 kc	182 to 550 metres
E	515 kc to 200 kc	580 to 1500 metres

In the crystal version Band A or (occasionally) C was deleted and replaced with a fixed-tuned coil.

The valve filaments were arranged in two parallel strings which were connected in series for a 12 volt supply and in series/parallel for a 6 volt supply. This was accomplished by a special socket on the appropriate 6 or 12 volt battery power cable. In an emergency the receiver could be operated direct from a HT battery and the secondary batteries, bypassing the vibrator or the mains supply unit.

All the gear was heavy to transport and those watchers located on New Guinea had teams of young natives on hand ready to disassemble and transport on a moment's notice. This together with the rest of the gear including batteries, Briggs and Stratton generator, fuel and oil formed quite a sizeable logistics exercise in itself.

The radios themselves were not designed for the tropics and

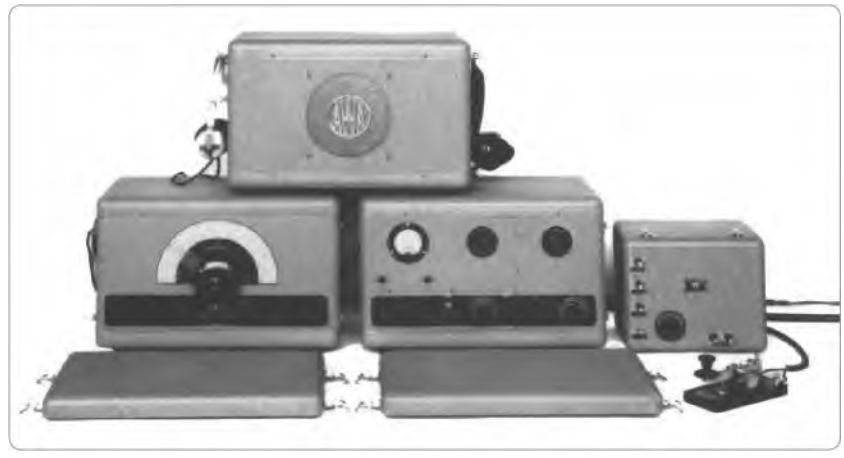


Photo 2: AWA 3B Set.- PSU with mike, headphones and speaker on top, receiver on bottom left, transmitter, aerial tuner and key on right, covers in front.

Photo 3: 3B Transmitter: the interior of this model, which has an in-built 240 V Power Supply. The 807 and output coil can be seen at the top left.

constantly had condensation forming on the insides of the sets, so to compensate for that they were set over a modest fire every morning to assist in drying them out.

AWA War History

On 28 March 1922, the Commonwealth granted AWA an exclusive right to construct and operate stations in Australia for a direct commercial wireless telegraph service linking Australia with Great Britain and Canada. Control of the existing Coastal Radio Service (27 stations) was also transferred to AWA. 150 engineers and operators were also transferred to AWA. One of the 27 stations was a new one on Willis Island commissioned in 1921. The stations around Australia were referred to as the Coastal Radio Service and those in New Guinea and the islands were referred to as the Island Radio Service.

The Coast Watching Organisation of World War 2 was based on the original Australian Coast Watching Organisation which started in 1919 when selected civilian personnel in coastal areas were organised on a voluntary basis to report in time of war any unusual or suspicious events along the Australian coastline.

The concept was quickly extended to include New Guinea (but not Dutch New Guinea) as well as Papua and the Solomon Islands. There were about 800 personnel in the Coast Watching Organisation in 1939.

Eric Feldt had resigned from the Navy before the war and was employed by the Government in New Guinea. He knew the Island people, the Government Officials and the Plantation Managers who all placed great trust in Eric Feldt. Because of this, many civilian Coast Watchers opted to stay in New Guinea after war was declared while other civilians were ordered to be evacuated. They volunteered to stay behind Japanese lines and risked being captured as a civilian spy by the Japanese.

Feldt had requested that Coast Watchers be given Naval rank. Lieutenant Commander RBM Long, the Director of Naval Intelligence supported the recommendation, but Naval red tape prevented it from happening. After further initiatives by Feldt, the Navy were goaded into accepting this recommendation, once the Japanese attacked Pearl Harbor on 7 December 1941.

Thus the staff at Darwin, Thursday Island and Port Moresby were given RAN ranks. Operators then became Chief Petty Officers and Officers-in-Charge became Warrant Officers in the Royal Australia Navy Voluntary Reserve (RANVR).

The Coast Watchers included reliable persons such as: Post Masters, Harbour Masters, Railway Officials, School Teachers, Local Police, Government Servants and Officials, Missionaries, Civilian Airline Pilots, Patrol Officers, District Officers and Plantation Owners.

Many of the above Government officials would have ready access to radio equipment as part of their normal public service role. They would report on:

- unusual or suspicious events
- sightings of ships, aircraft or floating mines
- other matters of defence interest

The Coast Watchers worked on a voluntary basis entirely without remuneration. The Naval Intelligence Division produced and distributed a document called "The Coast Watching Guide".

Two of the New Guinea Coast Watchers were Read and Paul Edward Mason, who between them dodged capture by the Japanese constantly moving their base of transmission, while reporting on aircraft sightings to the US Forces, which proved pivotal for the war effort in the Pacific.

Mason was the Manager of Inus Plantation outside the township of Kieta. His outpost was located at the southern end of Bougainville overlooking the Buka Passage between Bougainville Island and Buka Island which was about 30 miles long by 10 miles wide. He was in regular communication with Port Moresby via his Teleradio.

He was a short fair man, aged somewhere over 40 years, who wore glasses who spoke slowly and deliberately. He had lived on the Islands for about the previous 20 years. He was a bachelor.

Use and repair of radios was one of his hobbies which enabled him to maintain more radio contact than most Coast Watchers. He would do his own radio repairs and wind his own coils. He could send and receive Morse code and understood signal procedures.

He was appointed as a Coast Watcher in 1939 at the start of the war in Europe. He was the Coast Watcher who gave Tulagi the warnings of Japanese aircraft on their way to bomb Tulagi.

On 25 February 1943 the following signal was sent to the Coast Watchers:

From Admiral Turner, Commanding Amphibious Forces: Large share credit our successes against enemy due splendid men in coast watcher service.

From General Patch, Commanding General at Guadalcanal: Your magnificent and courageous work has contributed in great measure to success of operations on Guadalcanal.

Admiral Halsey indicated that the intelligence signalled from Bougainville by Read and Mason had *"saved Guadalcanal and Guadalcanal had saved the South Pacific."*

After fifteen months of operations, Read and Mason were ordered to evacuate the island and after days of trekking through the jungle to the west coast, both were separately removed to safety by the submarine USS Guardfish to Lunga point, Guadalcanal.

Mason returned to Australia for a well-earned rest but later returned for more Coast Watching duties

at Torokina from February 1944 to March 1944.

References on radios from *http://www.qsl.net/vk2dym/radio/3BZa.htm* Please check out this page for more information on these wonderful radios.

References on the war from *http://www.ozatwar.com/sigint/pemason.htm*

BARC Club News

Friday 8 July Social Night Presentation

We had a coolish night out at the club but we managed to warm up with hot drinks and lots of yummy chocolate biscuits. We had a very informative night with a presentation by Bob VK4BXI on the newly commissioned 2 metre cavities for our repeater.

As for me I did not understand why we needed the cavities in the first place as the 70 cm repeater we currently own ran on a mobile diplexer so Bob carefully steered us through the technical advantages of cavities and why they are far superior in clarity and range etc.

Well theory is one thing and Bob was sure he understood that part, but the practical is another thing, and just getting inside the cavity to access the tuning components was a real challenge, so just ask Bob next time you seem him and watch his face tell the story.

He finished his challenging project with three cavities for receiving and another three for transmitting, so we now have six in total.

BARC has a lot of donated cavities in our store room that Bob had to choose from to utilise for the 2 m repeater, but only after testing out the basic resonance of each cavity to find an approximate frequency fit before he could proceed.

Bob then took us through his long and slow process of constructing each of his home-built tuning devices for the cavities. And being inventive, he turned up his own copper blanks to house the tuning components which two were required for each cavity, then each blank required a TNC connector and then he had to fabricate each tuning apparatus to allow fine tuning from the outside, then test each one to get to the desirable levels, and finally to connect all three cavities together to perform the receiving and another three for the transmitting functions - so are you starting to get the gist of all the logistics yet? Whew!

Photo 4: Bob VK4BXI with the newly commissioned 2 metre cavities for our repeater.

Bob did spend plenty of time in pre calculation to get to the correct measurements for each device and again for the connectors and the correct length of cable etc., but always finishing with a trial and measure approach to narrow it down to finally achieve an acceptable outcome.

Bob is suitably chuffed with the success he finally achieved and so are we.

They have been in use at Kevin's VK4WA residence over the last month, but will soon be installed at the Rochedale Club house for a 24/7 operation. Details still to come.

As you can see it has taken some time to get to this point, but well worth the effort for our club.

You would think Bob would be ready for a well-deserved break from all his work, but the success of the 2 m cavities has him already thinking about creating some more cavities for the 70 cm repeater to improve its capabilities - Oh dear!

Have a great Day
Les Neilson
Rochedale Sth Qld
Ham VK4FAEB
BARC President

Don't forget

Don't forget to register for MEMNET.

VK6news

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

As I sit down to write this month's notes, NCRG Hamfest is one week away and looking good, well the weather isn't but the rest is.

Hamfest is the biggest event in the NCRG calendar and the major social gathering in this fair state of ours. Trying to find something new to add to the event is challenging so; if you have any ideas, please let us know well in advance if possible.

We did have a feedback form available on the day so hopefully those who attended will have registered their satisfaction and suggestions, or you can email me at the usual address.

Now down to business.

Firstly: an update on the repeater scene in WA, from two sources.

The Kellerberrin repeater, VK6RKN

The Kellerberrin repeater, VK6RKN (147.325 + offset) some 175 km East of Perth, on the Great Eastern Highway, had a major upgrade a while back with new antenna and coax.

The existing repeater, an Icom IC-FR5000 however was set up with the mute fairly hard set and a follow up visit was arranged. It was decided to replace the Icom repeater with a Yaesu Fusion repeater. The second visit to the VK6RKN site tested the duplexer and it was found to be okay. The Icom mute was set to be more sensitive but it was decided to replace the Icom with the Yaesu repeater and keep the Icom as a backup.

The Yaesu Fusion repeater does both C4FM digital and analogue FM. For the moment the repeater is fixed on FM while it is tested at the site. The repeater is open access, not requiring a CTCSS tone but the repeater is encoded with 123 Hz. Repeater power 20 watts. The site also has APRS on 145.175 MHz.

Regards
Will VK6UU

Peel Amateur Radio Group

Thanks for the latest Will, now to Michelle and the Peel Amateur Radio Group.

The Peel Amateur Radio Group now has their repeater up and running: VK6RMH.

Tune to 146.850 MHz with negative offset.

We also now have three meetings a month with the first being - On Air night on repeater VK6RMH or simplex on 146.550 MHz - first Tuesday of every month at 7 pm.

The second is our General Meeting the second Tuesday of every month at 7 pm.

The third is our Workshop/ Technical meeting at the SES HQ or other location as determined on the third Tuesday of every month at 7 pm.

Address 1900 at SES Mandurah HQ, 93 Park Rd Mandurah.

Thanks for the latest Michelle.

Bunbury Radio Club

Now to go further down south the latest from the Bunbury Radio Club and Norm VK6GOM.

The Club's Annual General Meeting was held on 9 July 2016. The following officers were elected:

President:	Richard VK6VRO
Vice President:	Norman VK6GOM
Secretary:	Nick VK6FSEA
Treasurer:	Murray VK6HL
Committee:	Darren VK6FGWN
	Jarrad VK6FFAR
	Shaun VK6PAL

A vote of appreciation was given to the outgoing committee for its sterling work, particularly President Richard VK6VRO. It has been a good year with much achieved.

The technical program for the rest of this calendar year is as follows:

August - Murray VK6HL
A demonstration of software defined radios

September - ***TBA***

November - Shaun VK6PAL
How to build a home brew antenna analyser

December - Richard VK6PZT
Raspberry Pi and robots

February - Bob VK66TJ
AM Broadcasting

March - Shaun VK6PAL
AIIMS

The next monthly meeting of the Bunbury Radio Club will be held on Saturday, 13 August from 2:00 pm. at 21 Halsey Street, Bunbury.

Bunbury Radio Club will be running licence assessments on 23 July 2016.

At present we have three Foundation applicants and three club hopefuls sitting for upgrades for their Standard licences. For further information, contact Norman VK6GOM on 0438 878 582.

A number of club members participated in the **International Museums Day** event. Under the auspices of the Boyanup Transport Museum they set up a station at the Dardanup Heritage Park. According to leaked reports it was a very

entertaining time. The park curator was very welcoming and the Club has a standing invitation to come back anytime. A small donation was made to the Museum on behalf of the club. The highlight of the event appears to be the culinary skills of Darren VK6FGWN at the Oz Pig fire. It is reported he was particularly liberal with the chili sauce. It also appears to be more of a social occasion as, apart from Richard's contact with India, the calls in the log were not numerous. We made many valuable friends in the crew at the Boyanup Heritage Centre. Thanks to you all that rolled up and made the weekend a raging success.

The Club has decided to participate in JOTA this year. Shaun VK6PAL advised that he has made contact with the Carey Park Scout group and that there will be a field day opportunity to participate in the JOTA program. The compound has been assessed and has been deemed suitable for dipoles etc. but unfortunately Shaun's spider beam will have to sit this one out. It was felt that this is a great public relations opportunity and Shaun will be doing a workshop with the scouts and is requesting some assistance on the day.

We will be looking at holding a Christmas function in November due to the difficulty in running such events in December. To support our various field activities we are looking at upgrading a trailer currently owned by Richard VK6VRO to accommodate club items at field events.

Danny Walton BR615 reported that due to the recent wild weather there had been some damage to the door on the repeater hut which nearly resulted in it becoming a Frisbee. He advised that he would be making repairs to this in the near future.

After a robust discussion regarding fees, it was agreed to raise the Club's annual membership subscription for 2016/17 to $50. Also, new members joining on a

Photo: Ray VK6ZRW President of the West Australian Repeater Group at VK6RKN.

date 3 months or less before the end of the financial year (that is, between 1 April and 30 June) are able to rollover their membership to the following financial year.

Any South West based amateur (or anyone interested in radio or electronics) is more than welcome to join and participate in our activities. Because so many of our members come from near and far we are evolving into a semi "virtual" club. Consequently, regular attendance at meetings is not a requisite for membership. The annual fee is only $50.00. Those wishing to join can contact the Club via our Secretary, Nick Evans on 0429 201 343, or *vk6brc@wia.org.au*. Further details can be found on our website at *http://bunburyradioclub.wordpress.com*

Thanks for the latest from the southwest Norm, keep up the good work.

HARG

It must be AGM season, and here is an update from **HARG** after their recent reshuffle.

The HARG had its AGM at the end of July. The meeting was well attended and all of the committee positions were filled. The new committee is Ray VK6ZRW as President, Martin VK6ZMS is Vice

President, Cliff VK6LZ is carrying over as Treasurer and Ian VK6DW is Secretary. The following are ordinary committee members VK6AN, VK6XJC, VK6PWD and VK6AAH.

The coming year promises to be rewarding as the Club organises its field day events and the club will very soon will be planning for the Hargfest in 2017.

We unfortunately had a couple of retirements from the committee this year. Richard VK6BMW has been a vital member of the club for a couple of decades and has held most if not all of the committee positions at one time or another. The other retirement is Bill VK6WJ, the clubs publicity officer for the past five years, and the mainstay of the HARGfest each year. Both of these retirements leave large gaps in the club knowledge base. Fortunately for the club they maintain membership.

Whilst the AGM is very important event in any clubs life, it was by no means the main event. The usual pre and post meeting activities of shack management, making those all-important QSOs on the radios and the usual mentoring took place. Current planning has the club installing a mast and antenna donated to club, for EME/ Satellite activities. The pre and post meeting activities also saw some members playing with their new DMR radios and learning to program them.

HARG Meetings are held twice a month at their clubrooms at the Paxhill Guide Hall near the corner of Brady and Sanderson Roads in Lesmurdie. The Social and Practical meeting is held on the second Saturday of the month and the General Meeting, often with a technical talk, on the last Saturday of the month. Doors open at 1.00 pm for a barbecue lunch and the meeting starts at 2.00 pm.

More information at: *www.harg.org.au*

Cheers from Ian VK6DW, Secretary HARG.

Thanks Ian, sorry for pressing you into service so soon after you taking up office.

NCRG

On the NCRG front, all activity has been centred on Hamfest organisation, the move to the new repeater site and the setting up of the remote station projects.

On all fronts things are moving very well, and we hope to be able to give detailed reports on all of the above next month.

Contest season is approaching and some repairs are needed on the 40 m beam to make us competitive again and after the storm damage to the 80 m four square, we will be hard pressed to have them all completed before the contest dates. Hopefully at least the 40 m antenna will be lowered in resonant frequency in time for serious use.

So thanks in advance to all who attended Hamfest 2016, which we reckon is the 29th consecutive NCRG Hamfest and hopefully there will be many more.

More info on the prize winners, and the event next month.

73 de Keith VK6RK

VK7news

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

Photo 1: Peter VK7PD setting up the linked dipole on Mt Killiekrankie, Flinders Island. (Photo courtesy of Al VK7AN).

Flinders Island Amateur Radio Club (FIARC)

Thanks to Peter VK7PD for the report on FIARC activities in July. Al VK7AN, Joe VK7JG, Peter VK7PD and Barry VK7BE headed to Flinders Island and met resident Gavin VK7VTX to plan FIARC amateur activities. They started with a SOTA activation of Mt Killiekrankie (VK7/NE-057) and seventeen contacts were made on 40 m to VK2, 3, 5 and 7. The FIARC AGM was held in the Furneaux Tavern which saw no change in office bearers and future SOTA activations were planned. The trip finished with a fishing trip to East Kangaroo Island thanks to Secretary and host Robin Walker along with some close encounters with Cape Barren Goslings both hatched and unhatched!

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

Congratulations to Eric Van Der Neut and Mike Dunn who have both upgraded to Advanced licences. Eric is now sporting VK7EV and Mike VK7MD. Anyone in the North West interested in training and/or assessment in Burnie are encouraged to contact David, VK7DC, either directly or by email *vk7dc@wia.org.au*

Northern Tasmanian Amateur Radio Club (NTARC)

NTARC were involved in the Burnie Equine Endurance Association's ride at North Motton in July 2016 and provided safety communications. This was an 80 and 40 km ride in challenging radio terrain. Thanks go to Norm VK7KTN, XYL Lorraine, Peter VK7KPC, Roger VK7ARN, Ken VK7KKV, Bill VK7MX and Yvonne VK7FYMX.

Joe VK7JG and Peter VK7PD have been playing 3.4 GHz in Northern VK7 thanks to the Geelong Amateur Radio Club supply and modification (June 2016 *AR* magazine) of these flat panel units. Mt Barrow was used as a passive

reflector with Joe using a 70 cm handheld and Peter an FT-817 as IF radios.

9 July 2016 saw an NTARC BBQ meeting and following the business meeting there was a show and tell session commencing with Bill VK7MX and an Arduino based 2 m/70 cm Hamsheild transceiver, a PocketCHIP tiny and cheap Linux computer and finally a TYTMD-380 DMR UHF handheld. Peter VK7KPC then completed the session with a demonstration of his new VHF fox-hunting receiver, complete with home-made three element Yagi made from measuring tape. A sumptuous supper completed the evening.

Radio and Electronics Association of Southern Tasmania (REAST)

New Foundation calls are on the air and congratulations to Richard VK7FLCS, Craig VK7FCLM, Greg VK7FGRA, Angela VK7FAMP and Randall VK7FGRP.

REAST's July event was a visit and tour of the Moonraker antenna manufacturing facility thanks to Adrian, Danny VK7HDM and Andrew VK7AW. Moonraker manufacture over 390 antenna products and they are about to add 6 m, 2 m and 70 cm amateur antennas to their range. They will be at the Biennial VK7 Hamfest at Miena on 26 November 2016. Danny had setup a broadband HF antenna on the test range and 40 m from around the world was booming in.

The 23 cm QSO party continues to be successful after the VK7 Regional News broadcast on Sunday morning with up to eight stations from around Hobart and via digital (WSJT) from Launceston. We start on 1296.1 FM, move to SSB then digital modes.

Our regular DATV Experimenter's night had a special treat with a presentation from Dave Bowerman, who I think it is safe to say is a guru maker and hacker! Dave took the audience through the development of the Dark Mofo (Mid-Winter Festival) flaming pyramids that many people would have seen at Dark Park and the Winter Fest. These art installations are controlled by networked (3G, WIFI & Bluetooth) Raspberry Pis that sequence the gas release, timing (flame shape) and safety features. Dave took the audience through their construction, development, trial, tribulations, engineering and testing along with the rigorous certification that they need to meet to be allowed to be used at a public event.

Our other DATV Experimenter's Nights included a very nice Flex Radio 6000 complete with the WiFi Maestro cordless control panel

Photo 2: Moonraker Antenna manufacturing facility. (Photo courtesy of Justin VK7TW).

Photo 3: Dark Mofo Mid-winter Festival entrance with flaming pyramids. (Photo courtesy of Justin VK7TW).

thanks Winston VK7WH, upgraded linked dipole connectors and NBN connections on Macquarie Island from Warren VK7WN, Steve VK7OO with German company DX-Wire material for making sturdy G5RVs, vacuum capacitor controls and magnetic loops, Rex VK7MO with QRP EME and the new WSJT QRA mode. The author included XREF boards for the FT-817, Bulgarian SG-Lab 23 cm transverters, Arduino Morse decoders, 10 GHz Gunn diode transceivers and a blast from the past with some optical transceivers. Our videos included LimeSDR, SDR Academy from the Friedrichshafen Hamfest, *AmateurLogic.tv* and many more.

Silent Key

Frederick Campbell Harland VK7FC

Fred was born in Hobart on 10th January 1924 and lived his life in and around South Hobart. He was technically minded from a young age and used to fiddle with anything electrical that needed repair or just to find out how it worked.

He put his age up and joined the CMF in 1941 then resigned (or was found out) and at 17 years old joined the Merchant Navy as a Radio Op, where he served for the duration of the war years. He was awarded the Australian Service Medal for his service. He remained an active member of the RSL.

With his father he established the Fidelity Recording Company and as a side line mended anything electrical, radios, radiograms etc. This later became almost a full time job. He later joined the Hydro Electric Commission and remained there until he retired.

He gained his amateur licence in the early 1950s and his call sign was VK7FC. He set up his shack under the house and built his first transmitter and receiver. In later years he moved his gear into the corner of the lounge room and maintained his interest in Amateur Radio. His favourite medium was Morse code and he kept two keys side by side on his desk. If a yank contact started getting too fast to read he would silently change keys and send with the automatic sender until the receiver asked him to slow down. In later years he mastered the use of the computer with his Ham work.

He was ordained as an Anglican Priest in 1969 and served as Chaplain to the Repatriation Hospital, and for 11 years as Chaplain to the Mission to Seafarers which he became a Life Member.

Vale Fred VK7FC

(Harvey Skegg VK7HK)

Prepare

Jamboree on the Air JOTA | 16 October 2016

Jamboree on the Air involves both Guides and Scouts.

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

In Australia special callsigns can be allocated by ACMA.

How to make your hobby pay for itself

Peter Parker VK3YE

Radio gear has never been cheaper relative to income and benefits. But many still need to watch their dollars. $867 a fortnight on the age pension is not lavish. Kids and grandkids are demanding. The share market is uncertain and investment yields are low. And has anyone checked the price of pet food lately? Even if you eat better than tomato sauce and Home Brand macaroni there still may still be the opinions of significant others at home to overcome.

A new item arriving could provoke a stern rebuke. And don't think that, even if you installed a secret door from the garage to the shack, items can be brought home undetected. Despite a professed lack of knowledge, some partners know your shack better than you do. They have an uncanny ability to spot a new equipment arrival. If XYLs were customs officers or radio inspectors not a single unapproved Chinese handheld or kilowatt amplifier would likely grace these shores. Fortunately they're not. Instead they're with you.

Seen those ads from those crazy sellers on eBay or VK Classifieds? You know - the jokers who slap 800 dollars on their 'rare and vintage' FT-101 or TS-520. Partners may assume that it's those prices you're paying and overestimate your spending. However it's not all doom and gloom. Not all partners seek to restrain radio spending and even those who try could be won over. Besides once you've got a basic station, radio can be one of the cheapest hobbies.

For example our licence fee is under one dollar a week. Three or four more dollars weekly gets you WIA and all the club memberships you would want. That's about it for our fixed costs. I'll explain how you can recoup many of these later.

Then there are our variable costs. This is mostly equipment and antennas but could also include travelling to hamfests and DX holidays. They aren't strictly necessary but add learning, experience and enjoyment. If you do really well, you'll also get back these expenses.

Even if your domestic finances don't need it, earning a bit on the side from radio can fetch brownie points. $3000 on a new transceiver and a $1000 hobby income present better to a querulous partner than $2000 spent with no income. The former implies you're making some effort and there's always the hope of doing better next year. The fact that it complicates your affairs keeps them guessing for longer (a technique also apparently beloved by tax dodgers).

Just imagine that this time next year you could be coming from a hamfest and be able to say with a straight face that your hobby paid for all purchases. You still get the booty but no more guilt or worrying what other think. That is what a supplementary income can do.

The depreciation trap

However, before we talk about making money it's essential to discuss how not to lose it. Whereas making a buck normally requires doing something extra, keeping it just means not doing something stupid. The latter particularly appeals to lazy people like me. The financially silliest thing an amateur can do is to buy an expensive new transceiver and after mere weeks of ownership sell it as a second-hand unit. How often do you see ads on VKHam or eBay where sellers are offloading current model transceivers so soon after buying them new? Especially if they say it's hardly been turned on. They're either lying, they're stupid or unforeseen circumstances have forced a sale. My commiserations if the latter applies. But otherwise, reselling so soon is crazy. Why would anyone spend big on something they don't like or use?

Unless they find an equally silly overpaying buyer the poor seller is going to take a haircut. Equipment depreciates most in its first few years. Selling will realise a big loss – maybe a hundred dollars per contact if hardly used. Big mistake! Never buy major equipment new if there's any possibility of having to sell so soon afterwards. In contrast an older rig is already largely depreciated. The used price of an FT-7 or TS-520 five, ten or thirty years ago is hardly different to now. So, unless a fault develops during your ownership, you will hardly lose a cent if you need to resell. Indeed it may have even gone up if it becomes fashionable amongst the 'boat anchor' crowd. Don't get me wrong; I'm not saying 'never buy new'. Indeed with lower prices and longer warranties buying new is fantastic value today.

Compare today's new prices with those of thirty years ago where a multimode 160 m - 70 cm station would have cost two to three months wages or a big part of a house deposit.

Notwithstanding today's lower new equipment prices, the value is only there if you keep and use it heavily for years. Chopping and changing new gear gives the pleasure of trying numerous rigs but is the surest way to lose money through depreciation.

With losses taken care of, we can now discuss the income side. Below are six ways to earn money from radio or radio related activities.

1. Submit a circuit idea to a magazine

If you tinker with circuits and find a way to do the same thing simpler or find an ingenious application for an existing circuit, you could do a lot worse than draw the schematic, make a few notes and send it off to *Silicon Chip*. It could end up in their readers' circuit section. The payment is modest but will still offset a large percentage of our annual licence fee.

2. Fix things

Maybe you're better at repairing. People who fix have my utmost respect; I think it's harder than building from scratch. A faulty item might be 99% good but it doesn't take much ham-fistedness to reduce it to almost nothing. Whereas if building from scratch you start at 0% and the only way you can go is up.

There's two main ways you can earn from repairing.

You could buy used non-working items, repair, then resell at a higher price. Key determinants of success include not overpaying for the defective item, avoiding models which are prone to faults not time-effective to fix, and knowing a fair resale price. Your resell price less purchase price, any parts required and a time component must leave a reasonable surplus for this to be worthwhile.

The other option, if you're bold, is to take in repairs from others, bearing in mind that most amateurs can no longer repair their own equipment. Small-scale repairers often work from home, and because they don't always advertise, can be hard to find. It may be possible to combine repair with restorations if historically and mechanically inclined. This can boost profits because restorations appeal to emotions such as nostalgia and reliving youthful experiences. Certain socio-economic demographics, notably WOOPies (or well-off older people) are well represented in amateur radio and have the means and inclination to pay a premium for such services. Whatever style of repairing you favour, time can get away from you and if not careful you could be working for slave labour rates. That may be fine if you love it but don't let it become a hassle. Recurring problems that your customer expects to be fixed for nothing is another risk. Still, repairing can impart rarely taught practical knowledge and help you maintain your own equipment.

As you can tell, I'm lukewarm on repairing for others due to the risks involved. However the right person may still find it worthwhile.

3. Make and sell radio parts, gear or kits.

Even though most ham shops have gone, there's still people making and selling radio gear. Even for amateurs. Even in Australia.

How many know that we have a strong amateur radio kit scene in Australia, exporting all over the world? E.g. VK2DOB's OzQRP and VK5EME's Minikits. Today's kits are much better in capability, quality and price compared to the few available 30 years ago.

It's a lot of work assembling lots of parts and making sure nothing's missing. But low component costs, cheap printed circuit board manufacturing, internet marketing and online ordering has made it easier for the one man band than it used to be.

Accessories are another opportunity - especially for popular sub interests of amateur radio. Look at G3CWI's SOTA beams in the UK. They sell bits of plastic as dipole supports etc. Personally I'd use a bit of chopping board and build my own ATU but there's obviously a strong market for premade stuff. Even if you just brought some squid poles and other antenna accessories to hamfests you could do well.

It's essential to keep costs down, reply to emails and send out orders immediately. The latter's really important, even though it's a pain to find an open post office. My only attempt at manufacturing was over 20 years ago where I sold a grand total of just one item. But if you've got the right product it could be a goer. As a specialist you can know your market better than anyone and target opportunities too small for larger players.

4. Website advertising

Have a website? Why not monetise it and get small payments? One option is to put banner ads on it. Success here depends on the amount of traffic you get and the number of people who click on the ad.

Some amateurs set up websites that are just pages of links or unoriginal content from others. I'm not a fan of either – there's already enough digital clutter out there. Only start a website if you've got some original content. Some engaging accounts of your experiences with some equipment, antennas and projects are good enough.

There's various ways to monetise your website but one I use is called Google AdSense. You paste some code into your website and banner ads appear. My website – vk3ye dot com – earns maybe $5 per month. Like submitting things to *Silicon Chip*, it's not a fortune but can offset smaller expenses like annual licence fees.

Some people with websites (and YouTube channels) think they're a charity and ask for donations. Sorry, but I'm not a fan. It makes viewers feel guilty. As much as some dislike sales and advertising, I prefer these as a cleaner approach which do not obligate your audience merely for reading.

A variant of website advertising is affiliate marketing where you get a small cut of items purchased through your site. I've seen sites where you can buy things like HF transceivers through them. I'm sceptical how many people actually do but even an occasional sale might make it worthwhile. I've got no experience but you'd want to tie it with unique and regularly updated content to drive visitor traffic.

5. A monetised YouTube channel

Higher paying than website ads are ads on YouTube. Again you need to create content that people will watch. Practical people may prefer to produce a video than writing text for a website.

The best Australian example is Dave Jones' Electronic Engineering Video Blog which gets over 70 000 views per day. After doing it part time for a while, Dave quit his job to become a full time video blogger (see *http://www.youtube.com/watch?v=XwAVYbV5rLk*).

Even if you achieve Dave's success, YouTube income by its own isn't quite enough. But together

with other income like website ads and merchandise it can work if viewership is high enough.

Amateur radio is a more niche market, so the numbers will be smaller. Even a popular amateur radio video 'only' gets tens of thousands of views over several years. Still, that's still worthwhile revenue if monetised.

I have produced a few YouTube videos, including one on how to do it. Editing is both important and time-consuming. A good five minute video may require 60 minutes footage which takes several hours to edit.

All you need is a digital camera, some editing software and a YouTube account. Start with an antenna, project, kit or equipment review. Say a few words about it, demonstrate it in action, edit and upload.

Antennas are always a popular topic for YouTube videos. In particular I've found that portable antennas and magnetic loops attract high and consistent interest. As well I've found that people who view antenna videos are more likely to click on an ad. Popularity and a high click-through rate both multiply revenue for you.

A moderately popular YouTube channel covering something like amateur radio might fetch fifty dollars per month across all videos. That could make your hobby self-funding if you don't spend much. Making one video per week will keep people watching. That sounds a lot but is made easier if you stick to one topic per video. Even topics I've balked at due to their simplicity, repetition or silliness still seem to attract views, so if in doubt make a video anyway.

6. Write an ebook

You hardly see paper books or newspapers on trains anymore. People are either fiddling with their phone or reading off an iPad or Kindle. Why not become the author whose words they're reading?

Electronic books are ideal for independent authors who can write on a specialist topic with worldwide interest. If you think that sounds a lot like amateur radio you'd be right. There are no hassles with publishers, postage, packing or unsold stock. EBooks can be a simple Word document uploaded to Amazon in minutes. Publishing costs are zero and authors keep nearly 70 percent of sales. A $5 eBook will fetch around $3.50 per sale. Independent authors often outsell established publishers who have high costs and are poor at cultivating niche markets.

It's not all beer and skittles. 90% of Kindle eBooks get very low sales like one per day or less. To do better you need good promotion. Luckily this can be free apart from the small time involved. I suggest at least a website, a YouTube channel and targeted social media and forum posts. Favourable reader reviews on Amazon, websites, twitter or Facebook further boost sales.

Then there's the writing itself. A big book can take a year – on and off – to write. You might be able to cut it down to 3 to 6 months but much less is unlikely. Still that's not a bad thing since time allows reflection, revision and a better product. Writing is best suited to those who have a lot of dead time – like commuting – that can be utilised.

Even then you can sometimes lose interest before coming back to it. Or you might have a book that's almost there but spend days procrastinating about hitting the publish button. Both those things happened to me while writing 'Minimum QRP' which covers all aspects of low power amateur radio. However it has proved a rewarding project with 1000 sales and substantial revenue in its first three months.

Conclusion

I've described six ways to make your hobby pay for itself. No doubt there are many more. Out of those suggested I suggest making videos (preferably about antennas) as the best way to get started. But if you have time and can write then eBook publishing promises even greater rewards and a truly self-funding hobby.

A modified version of this article was presented at the 2015 Southern Peninsula Amateur Radio Club Radiofest.

Hamads

FOR SALE – VIC

Yaesu FT-480R 2 metres all mode transceiver E.C. with handbook $300.

Yaesu FT-212R-H 2 metres FM transceiver no handbook $50.

Yaesu FT-2700 twin band 2 metres, 70 cm transceiver no handbook $70.

Prices as stated or $600 the lot.

Mirage 2 metres linear amplifier B 108 with remote control and operating instructions $200.

Phone Brewster Wallace VK3YBW on (03) 9527 2661 between 6 PM and 10 PM. If no answer, please leave a message.

WANTED – NSW

Wanted, Australian Telegraph Keys.

By author and historical collector. Cash paid for good quality keys, Working or not. Steve VK2SPS *vk2sps@froggy.com.au* Mob. 0415-559-784, Ph. 02-9456-0130.

Contributions to *Amateur Radio*

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

Your contribution and feedback is welcomed.

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

Email the Editor:
editor@wia.org.au

About Hamads

- Submit by **email (MUCH PREFERRED)** or if written and mailed please print carefully and clearly, use upper AND lower case.
- Deceased estates Hamads will be published in full, even if some items are not radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTH-R means the address is correct in the current WIA Call Book.
- Ordinary Hamads from those who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.
- Commercial advertising on these pages Contact admanager@wia.org.au
- Copy to be received by the deadlines on page 1 of each issue of Amateur Radio.
- Separate forms for For Sale and Wanted items. Include name, address STD telephone number and WIA membership number.

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

TRADE PRACTICES ACT
It is impossible for us to ensure that the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore, advertisers will appreciate the absolute need for themselves to ensure that the provisions of the Act are strictly complied with.

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

ADVERTISERS INDEX

The WIA – It's for You!
Your WIA – Your Voice

Since 1910

The Wireless Institute of Australia - a single, national organisation run by radio amateurs for radio amateurs

Benefits of Belonging

Amateur Radio magazine
- The only Australian magazine devoted to your hobby
- 11 issues a year (Jan/Feb combined)
- Online Digital and Print versions
- Covering all facets of amateur radio and shortwave listening
- Written and produced by members

QSL Service
- Send and collect your precious QSL cards
- Free to members!

Annual Callbook
- The primary reference for who's who and what's what
- A directory of Australian callsigns
- Info on bands, beacons, clubs, repeaters and more
- Discount price for members!

Awards
- Go for gold! Well, at least a certificate
- Show off your achievements!
- Online Awards System
- Worked 100 countries
- Worked all continents
- 100 VHF contacts
- 10 Antarctic contacts & many more!...
- Sponsored, promoted and administered by the WIA

Contests
- Want to test yourself? And your station?
- HF, VHF/UHF Field days. Local and multi-national contests
- Sponsored, promoted and administered by the WIA

WIA Bookshop
- All the must-have books covering your needs
- Extensive range
- Members get a discount!

Support For Your Local Club
- Resources for club education and exam services
- Public liability insurance
- Beacon and repeater licence coordination
- Promoting club activities and events

Working for You

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

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

Licence Exams and Certificates
- Organising and administering licence exams
- Training and qualifying exam assessors
- Your Certificate of Proficiency – issued by the WIA

Callsigns
- Passed your exam? We have a callsign for you!
- Want a new callsign? We can arrange that!

National News Service
- Keep up-to-date
- Weekly broadcasts – 30 minutes of national news
- Also online in text and audio
- Website news bulletins - reported "as it happens"

WIA Around the World

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

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

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

- **Time to renew your membership? Look over the list again.**
- Renew online: ***https://wiamembers.memnet.com.au/***
- **Encourage a friend to join.**
- **Show them this – and then send them to: www.wia.org.au/joinwia/wia/onlinejoin/**
- **Or call (03) 9729 0400 (9 am to 3 pm, Mon. to Fri.)**

The Wireless Institute of Australia

ABN 56 004 920 745

PO Box 2042, Bayswater VIC 3153. (03) 9729 0400

Volume 84 Number 9 SEPTEMBER 2016 Print Post Approved PP100007960

ICOM

TAKING AMATEUR RADIO TO THE NEXT LEVEL

ID-51A PLUS

ID-5100A

D-STAR

Join the Global Digital Amateur Radio Community

Help promote Amateur Radio throughout the world, join the Icom D-STAR QSO Party 2016. Simply communicate with other D-STAR operators in as many different countries as possible. For more information visit www.icom.net.au

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