

# Amateur Radio

Volume 87  
Number 4 ▶ 2019  
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# Amateur Radio

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## Editorial

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*This month's cover:  
Main picture is a 6 GHz 27 metre diameter dish  
used for Moonbounce EME communications  
attempt.. See VK6 News on page 49 for details.*

## 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  
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WIA cannot be responsible for loss or damage to any material.  
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## 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 radio-communication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest

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Andrew Chapman VK4QF

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## Editorial

*Dr Harry Edgar VK6YBZ*

You will all be aware by now that changes have taken place in the management of the production/ editorial team of the *AR* magazine. These changes have provided an opportunity to review the operation and content of our Journal and make it, once again, Australia's premier electronics and amateur radio publication.

In order to achieve this the future magazine needs a faster turnaround, increased technical value (for example, the number and style of technical articles) and a unified supporting online/digital approach. The editorial process will be undergoing changes to streamline the review process and remove the barriers to publication that have existed in the past. Some new articles of interest to the wider community of electronic, digital and radio technical developers will be added to increase the reach of the journal.

We will be developing an upgrade in style, content and advertising for the magazine and it will be supported by content sourced through and within the digital and social media environment. A team of Digital

Content Technical Editors and technical support has been appointed to ensure material is fast-tracked into the digital space that is relevant content and quickly available to readers. Material will be selected from the digital channel for inclusion in print media with those who have contributed articles, that will be published in *AR*, with contributors rapidly notified so that they can participate in the publishing process. Accordingly, we will be seeking expressions of interest for additions to both the Digital Technical Editor team as well as those of Technical Editors for the print material. If you are forward thinking with an interest in getting exciting new information to aspiring and current electronic, digital and radio amateurs please contact me on [vk6ybz@wia.org.au](mailto:vk6ybz@wia.org.au).

In addition to new articles of broader interest you will see an exciting new regular multi-page inclusion that will be called *Amateur Foundations* focussed entirely on the delivery of resources to aspirant and early stage operators. This will include regular material from Onno Benschop (VK6FLAB).

I hope you will look forward to receiving your new look journal and follow us regularly on social media.

### About Dr Harry Edgar

Dr Harry Edgar has a Bachelor degree in electronics and a PhD in Telecommunications from what is now Northumbria University UK. He spent four years as Senior Lecturer, then Head of Department and Acting Dean of Faculty of Engineering and Communications at what is now Leeds Beckett University UK teaching to final year degree telecommunications students, research and PhD student supervision.

He then spent eleven years at Curtin University Perth teaching to final year telecommunications students and PhD student supervision. Harry has spent many years in engineering, technical development, management and troubleshooting in power control and process control systems.

He has a post grad Certificate in Law specialising in Contract Law from Notre Dame University and has spent 13 years in state government Main Roads in Contract Management, Contract Superintendent and Contract Development and Writing. He has experience in business management, organisation and operational troubleshooting, investment and start up development experience.



# Board comment

Greg Kelly VK2GPK

This is my first Board Comment in the magazine as newly elected WIA President, having been in this role for just over three weeks as I write this column.

I wish to thank our immediate past president, Justin, for his contribution to Amateur Radio and to the WIA during his two-year term as WIA President. Similarly, I would also like to thank Marcus for his contribution as WIA Director over the last two years.

## The 2019 WIA Conference and AGM

In the last AR magazine issue in the Board comment, WIA President Justin wished Waverley Amateur Radio Society (WARS) a happy significant birthday ahead of the 100 year celebration which was held, appropriately, in the Marconi Room of the Sydney Town Hall on Friday evening 24 May 2019. I can report that the event, the first of the 2019 WIA Conference Weekend agenda, was a great success, with the highlight being an enthralling talk by author David Dufty about his book *The Secret Code-Breakers of Central Bureau*.

As a largely under reported facet of Australian military history, *The Code-Breakers of Central Bureau* tells the story of the country's significant code-breaking and signals-intelligence achievements during the Second World War. It is the story of Australia's version of Bletchley Park, of talented and dedicated individuals who significantly influenced the course of the Pacific War.

Sunday's events were hosted by ARNSW at Dural, northwest of

Sydney— with more technical talks, great food and stalls including SOTA, ALARA, WICEN and CREST plus many others. And for those not entirely obsessed with Amateur Radio, there were sight seeing tours to various places of interest around Sydney.

I wish to sincerely thank the 2019 organising committee, WARS and ARNSW for their invaluable assistance in making the weekend such great success. Next year it is Hobart's turn, so save the date, 8-10 May 2020.

## 2019-2020 WIA Board

Following the AGM on Saturday afternoon, the new board for 2019-2020 met briefly for the first time to elect office holders. We welcome newly elected board member Mike Alsop VK8MA from Katherine, NT. Peter Clee and Greg Kelly were returned for their second term on the board. Aidan Mountford and Dr Harry Edgar are continuing directors. The WIA, as per its constitution, elects half the board each year for continuity.

Peter Clee continues as Secretary, Aidan Mountford was elected as new Vice-President and Greg Kelly was elected as new WIA President.

## AR Magazine editor

You may be aware that Peter Freeman's 14 plus year role as magazine editor regrettably came to an end on June 26. We wish Peter well in his future endeavours.

Peter's outstanding service to the continuation of the magazine for so many years is gratefully acknowledged - he has been in the editor role since the very early days

of the WIA National organisation. In that time, he has led the Publishing Committee (PubCom) to produce well over 100 magazine issues, as well as the yearly WIA call book. The WIA AR magazine has a great tradition going back to the 1930s and earlier, and Peter has been the editor for a significant part of that history.

Dr Harry Edgar has volunteered to takeover this role in the interim as WIA Editor-in-Chief. The board also wishes to thank PubCom members for their invaluable assistance in the transition period to a new editor, plus also for their untiring service in the consistent production quality of the magazine. Volunteers for the position of new Editor as well as those of Digital Content Technical Editors and print Technical Editors with various skillsets are most welcome. Contact Dr Edgar at [vk6ybz@wia.org.au](mailto:vk6ybz@wia.org.au)

## WRC-19 World Radio Conference

WRC-19 Preparatory meetings, which started last year and have been attended by WIA representatives, continue in the lead up to WRC-19. The WIA delegates, Dale Hughes and/or Peter Pokorny, attend these meetings (and the WRC conference) at the invitation of the Australian Department of Communications and the Arts (DOCA).

World radio-communication conferences (WRC) are held every three to four years. It is the job of WRC to review, and, if necessary, revise the Radio Regulations, and the international treaty governing

Continued on page 4



## Board comment Continued from page 3

the use of the radio-frequency spectrum.

WRC-19 is being held in Sharm el-Sheikh, Egypt, 28 October to 22 November 2019. Over 3000 delegates will attend from around the world – the venue will be secured as a compound.

The WIA, as the sole Australian AR peak body recognised by the IARU / ITU, views this international representation as one of its most important responsibilities, if not the most important – despite the non-trivial cost. This view has been strongly supported by recent member surveys.

### Examination and Callsign Services

With the awarding by ACMA of the contract (called the “deed”) to the Australian Marine College in

early February this year, now 5 – 6 months ago, it is worthwhile to take a checkpoint on how the new provider is servicing the amateur community.

Marc Hillman, WIA statistician, has done some statistical analysis of net new licences over this period. This analysis would indicate that the rate of new amateur qualifications is down considerably, period to period, compared to last year – at least 50% less, and most likely 65% less. The implications for the future of the hobby are self-evident.

As for Quality of Service (QoS), many AMC assessors have advised anecdotally, that cycle times (turnaround times) are considerably longer in terms of time to get results (was previously same day) and for initial callsign issue.

### ACMA LCD Consultation - closing August 9

This consultation period may have closed by the time you read this, however, be assured that the WIA will represent the interest of its members by strongly lobbying to minimise any negative impact from the proposed changes.

The majority of changes previously proposed by the WIA have been accepted by the ACMA. The main area of concern are ACMA proposed changes to the existing licence structure aimed at reducing the ACMA regulatory burden, that are likely to have far-reaching unintended consequences.

On behalf of the WIA Board  
73

**Greg Kelly**  
WIA President

### Promote our hobby

Have you considered using your unwanted *Amateur Radio* magazine to promote the hobby and the WIA?



Consider taking it to the office of the local health professional (doctor, dentist, etc.).

You never know, **you might stimulate someone** to consider taking up our hobby!

## AMSAT - Lightsail-2

Lightsail02 is scheduled for Launch June 22 - Beacon on 437.025 MHz

LightSail is a citizen-funded project from The Planetary Society. This CubeSat will be propelled solely by sunlight, to Earth orbit. LightSail 2 is scheduled to launch aboard a SpaceX Falcon Heavy on June 22, 2019, and we will attempt the first, controlled solar sail flight in Earth orbit.

LightSail 2 will ride to space aboard the Department of Defence

Space Test Program-2 (STP-2) mission which will send 24 spacecraft to 3 different orbits. LightSail 2 itself will be enclosed within Prox-1, a Georgia Tech-designed spacecraft originally built to demonstrate close-encounter operations with other spacecraft. Prox-1 will deploy LightSail 2 seven days after launch.

## 9-year-old gets 1.5 kW ham radio licence

The Carroll County Times reports kids can do anything they want if they put their heart into it -- AND IT'S NO ACCIDENT!

The newspaper says: Carroll County Amateur Radio Club [in Maryland] held amateur radio license testing for attendees of their latest licensing class. The testing was held at the Public Safety Training Centre.

One special participant was 9-year-old Caleb Marquart [now KC 3 NKX].

To pass the class, club president Peter Hiltz WV3S said, "Caleb had to learn electronics and amateur radio etiquette sufficient to pass a Federal Communications Commission test. The test is 35 questions you need to get 26 correct to pass.

Caleb has a Technician license with permits 200 watts output in four HF bands and 1,500 watts output on the bands above 50 MHz.

## France proposes 144-146 MHz for Aeronautical Mobile Service

The next meeting of the CEPT WRC-19 Conference Preparatory Group takes place this week, June 17-21, in Prague France has submitted a paper with the subject Agenda Item 10 revised proposal for an agenda item for new non-safety aeronautical mobile applications.

The paper says: *"The list of bands that are proposed for study of possible new allocations to the aeronautical mobile service on a primary basis is revised by adding the band 144-146 MHz, the bands 5000-5010 MHz and 15.4-15.7 GHz being maintained."*

*Aeronautical applications like fire and border surveillance, air quality environment and traffic monitoring, disaster monitoring, terrain modelling, imagery (visible, infrared, radar, etc.), video monitoring require non-safety communications between various types of aeronautical platforms.*

*Consequently the need of non-safety data communications between various types of aeronautical platforms increases and so the need for new frequency bands."*

## IARU

Two proposals under discussion in Europe as possible World Radiocommunication Conference 2023 (WRC-23) agenda items "could impact important Amateur Radio frequencies," IARU Region 1 President Don Beattie, G3BJ, reported this week on the IARU Region 1 website.

Included is that proposal from France we told you of last week, to consider the 144 - 146 MHz band as a primary allocation to the Aeronautical Mobile service, as part of a broader

consideration of spectrum allocated to that service.

IARU has cautioned the amateur

community against overreacting to the news.

"This is one of the few primary allocations to the Amateur Service above 29.7 MHz and, as such, is an important and widely used part of the amateur spectrum with a vast installed base of users and operational satellite stations," Don commented.

"IARU views with grave concern any proposal to include this band in the proposed study."

Another proposal has been raised to study the 23-centimeter amateur allocation, 1240 - 1300 MHz, following reports of interference to the Galileo navigation system Europe's GPS system.

Don said IARU is aware of "a handful of cases" of reported interference to the Galileo E6 signal on 1278.750 MHz. "In all cases, these have been resolved by local action with the full cooperation of the amateur stations concerned," Don pointed out.

## ALAN PARR VK4AJA receives ORDER OF AUSTRALIA

Alan Parr (Lance Corporal 1RAR) received an Order of Australia for his Services to veterans. Alan was one of four Battle of Balmoral veterans who spent three years to have 2000 Australian personnel recognised for their bravery during this Vietnam War battle.

Alan was Secretary and committee member for the Fire Support Base Coral-Balmoral Veterans Group.

Congratulations to Alan Parr for his Queens Birthday Honour.

## Student rocket makes it to space

Where does the Earth's atmosphere stop and space begin?

Continued on page 6



The Krmn line is what the World Air Sports Federation (FAI) defines as space. That line is 100 km or about 330,000 feet above sea level.

A recent student-built rocket Traveler 4 claims to be the first entirely student-designed vehicle to pass that line.

The students from the University of Southern California launched the rocket from Spaceport America in New Mexico. The new record is over twice as high as the old record, set by the same team.

The rocket reached approximately 340,000.

The successful rocket was 13 feet tall and 8 inches in diameter. The 11 minute flight accelerated to a top speed of 4,970 feet/second which is over Mach 5.

The Krmn line, by the way, is not universally accepted. NASA and the US Air Force award outer space to be 50 miles above sea level the rocket definitely crossed that line.

The first man-made object to reach space, by the way, was the V2 rocket built by the nazi's during World War 2.

### **Extended 2m coverage in the NSW South Coast, Snowy Mountains and Northern Victoria regions**

A new 2m Repeater VK3RDH is now operational on 146.625 MHz-600Khz (no tone) in Northern Victoria. The Repeater, located on Mount Delegate, is just over the border with NSW. Early signal reports are said to have been favourable and so far received from

Sale, Bairnsdale and North Eastern Tasmania amongst others.

This 146.625 Repeater is linked to VK2RSE 147.375MHz +

600Khz (no tone) located at Mt Roberts near Bredbo and VK2RFS 146.750MHz - 600Khz (no tone) located at Mumbulla Mountain on the Far South Coast of NSW near Bermagui.

With these three Repeaters linked, 2m access is now provided from south of the Batemans Bay NSW area along the coast down to Eden, into the Monaro Plains and Snowy Mountains areas between Bredbo (and for those not familiar with the region it is Bredbro with a B.

Then Jindabyne as well as up into the NSW Main Range ski areas and west to Adaminaby.

This addition of VK3RDH now extends that coverage into Northern Victoria and surrounding areas.

VK2FJCM, Angelo Giuffr, says that the "Snowy Mountains Amateur Radio Club would really appreciate signal reports and testing from Amateurs in the North Victorian areas and welcome you to join them on their weekly 2m Net (VK2SNO) every Saturday at 1930 hours. They re-broadcast the WIA Weekly News Broadcast every Sunday night at 1800 hours. (Angelo, make sure callbacks@wia.org.au does get the check in figures.)

The club appreciates the work conducted by Peter VK2DIE and Didge VK2DIG over the course of the last couple of years to make the facilities and coverage possible.

### **AUSTRALIS OSCAR 5, THE ABC'S CONVERSATIONS & 8.4 MILLION CANE TOADS?**

Peter Wolfenden VK3RV, WIA Historian tells that a book about Space Junk, recently written by Australian Space Archaeologist,

Dr. Alice Gorman was reviewed and discussed in the ABC's radio program "Conversations" last month.

The official definition of Space Junk is along the lines of: "Something that does not now, or in the foreseeable future, have a purpose".

About half way through the 52 minute program, up popped "Australis Oscar 5" and a conversation surrounding it, Australia's first conceived, designed and built satellite.

Dr. Gorman and Fidler had "done their homework" about AO-5.

They knew when and where it was built during the mid 1960's and the fact that it was ready for launch in 1967. Dr. Gorman suggested that AO-5, still orbiting the Earth is part of Australia's space heritage. It 'could' be considered as space junk, but then she went onto suggest that it does indeed have a "future foreseeable purpose", for now it also has Cultural significance:

It represents Australia.

It was a Community Amateur Volunteer Project.

It was a useful project of co-operation world wide.

And it is not a big collision risk.

It is estimated between 23,000 and 29,000 bits of stuff larger than 10 cm and millions and millions of pieces smaller than 10 cm exist.

A very Queensland assessment of space junk weight was: more than 8.4 million Cane Toads!

The Cane Toad Index is possibly quite appropriate as cane toads are spreading out of control and effecting our Earthly environment, not unlike unwanted space junk!

## **WIA Contest Website**



To keep up to date with all of the major Australian contests, including rules and results, at the WIA Contest Website at:

**[www.wia.org.au/members/contests/about](http://www.wia.org.au/members/contests/about)**



# AM in a Digital Age

Stephen Coleman VK2ASC

Recently, a number of amateur operators who have a particular interest in heritage operations and in the AM mode generally expressed some concern at the ZL2SEA proposal to use 7.123 Mhz for automatic data modes (reported on the WIA News on 31 March 2019).

The concern has arisen because 7.125 MHz has for many years been considered to be the AM calling and net frequency on the 40 metre band and is the frequency used by the VK2BA AM Net on Saturday mornings at 22:00 Z. The net was named after the callsign of David McNaughton who started the net and who became a Silent Key in February 2015. David's widow, Jenny qualified and is the current holder of the callsign.

You may be surprised to hear that there is a lively group of amateurs who restore and use repurposed vintage broadcast equipment and valve based or hybrid amateur equipment for AM communications – particularly on 160, 80 and 40 metres.

AM receivers, particularly vintage receivers, cannot easily null digital signals within their passband, and such signals can render that frequency unusable for AM. This is a particular issue when much of the military and commercial repurposed equipment is crystal controlled, and there is limited or no flexibility to move within a band.

Part of the interest for those of us who operate AM gear is the heritage value in the restoration and use of ex-commercial, military and amateur equipment made in Australia (yes – we made very good radios once), in Britain, the US, Russia and elsewhere. Much of this equipment is impressive in size and in how well it performs, even by today's standards. In addition, there are many in the AM group who enjoy constructing CW and AM transmitters and TRF, regenerative and superhet receivers. There is little that sounds as good as a valve (tube) based receiver and a good AM signal.

It is hoped that the hobby is diverse enough, even with the limitations on available spectrum, for there to be some sensitivity applied to band allocations so that everyone can enjoy their particular part of the broad hobby of amateur radio.

As a result of these considerations, a few of us have formed the AMVK group. It has a short manifest which it is hoped will be of interest to Hams generally, but particularly to those with an interest in AM and "boat anchors" as well as in home brewing AM gear. The aims are modest, but it is hoped that they will be considered when Band Plans are being formulated. If anyone is interested in putting their name to the proposal in the manifest, please contact me on [vk2asc@wia.org.au](mailto:vk2asc@wia.org.au)

If you have an interest in "boatanchors" or if you have an AM mode on your transceiver and would like to chat, call in to the VK2BA AM Net on Saturday (and Wednesday) mornings at 8:00am EST (22:00Z).

73

Stephen Coleman

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# AMVK

A group of amateur operators\*, in Australia, who use and wish to ensure the preservation of AM as a legitimate and useful mode of emission:

## AIMS:

1. Ensuring the preservation and continuance of AM as a legitimate mode on each amateur band;
2. Preserving and using historical broadcast and amateur equipment and constructing new AM amateur equipment, in accordance with the regulations applicable to amateur service, in order to serve a valuable and enjoyable cultural function which is part of the historical
3. The recognition and allocation by convention in any WIA or IARU sanctioned Band Plan, or by regulation if appropriate, of one calling, and one net frequency, in every HF amateur band, 6 and 2 metres, for the primary purpose of AM communications.
4. Promote the addition of AM as a notation as a permitted mode in any Band Plan, in those parts of the band which are set aside for telephony;
5. Promote a specific note in any Band Plan, or in any relevant regulation, that digital modes or suppressed carrier telephony should not operate within 6 KHz either side of the AM calling / Net frequency on each band;

and ongoing development of amateur telecommunications;

The current/proposed frequencies which appear to sit within the current band plan and are generally agreed or coincide with some international AM frequencies are:

160M: 1843 / 1857KHz  
80M: 3.620 / 3.686 MHz  
40M: 7.125 / 7.150MHz  
20M: 14.250 / 14.286MHz  
10M: 28.3 / 29.0MHz  
6M: 50.800 / 53.100MHz  
2M: 144.250 / 144.280MHz

\* Current subscribers to these aims are: VK2ASC, VK5LG, VK2WD, VK4AR, VK4ANB, VK5KLT, VK2MNR, VK4AAT, VK5BUG, VK4KB, VK5WE, VK5AAQ, VK5WT, VK5JL, VK4COZ.

For further information, or to join, please contact one of our subscribers listed above.



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(Sellers from 07:00 hrs)

at

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Raffle will be drawn at 11:30

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Tickets \$10

Contact: Gordon VK4VP (Sec) or Bernie VK4KX (Pres)

Email: [sunfest@vk4wis.org](mailto:sunfest@vk4wis.org)

Entry fee \$5 (includes door prize tickets)

## Participate

**Central Highlands Amateur Radio Club Inc AGM Weekend**

27-29 Sept



# A simple QRP Transmit shield for Raspberry Pi single board computers

Erich Heinzle VK5HSE

The very popular Raspberry Pi single board computer was originally conceived as a cheap, powerful Linux platform for science, technology, engineering and mathematics (STEM) educators. It could be said that the Raspberry Pi is the 21st century equivalent of the BBC Micro of the 1980s. The Pi has undergone various revisions,

the most recent of which being a minimalist version 3 Raspberry Pi implementation, the Raspberry Pi Zero W.

The Pi Zero W is particularly interesting for radio amateurs for four reasons; first of all, power consumption has been reduced substantially, to less than a Watt; secondly, WiFi is built in; thirdly,

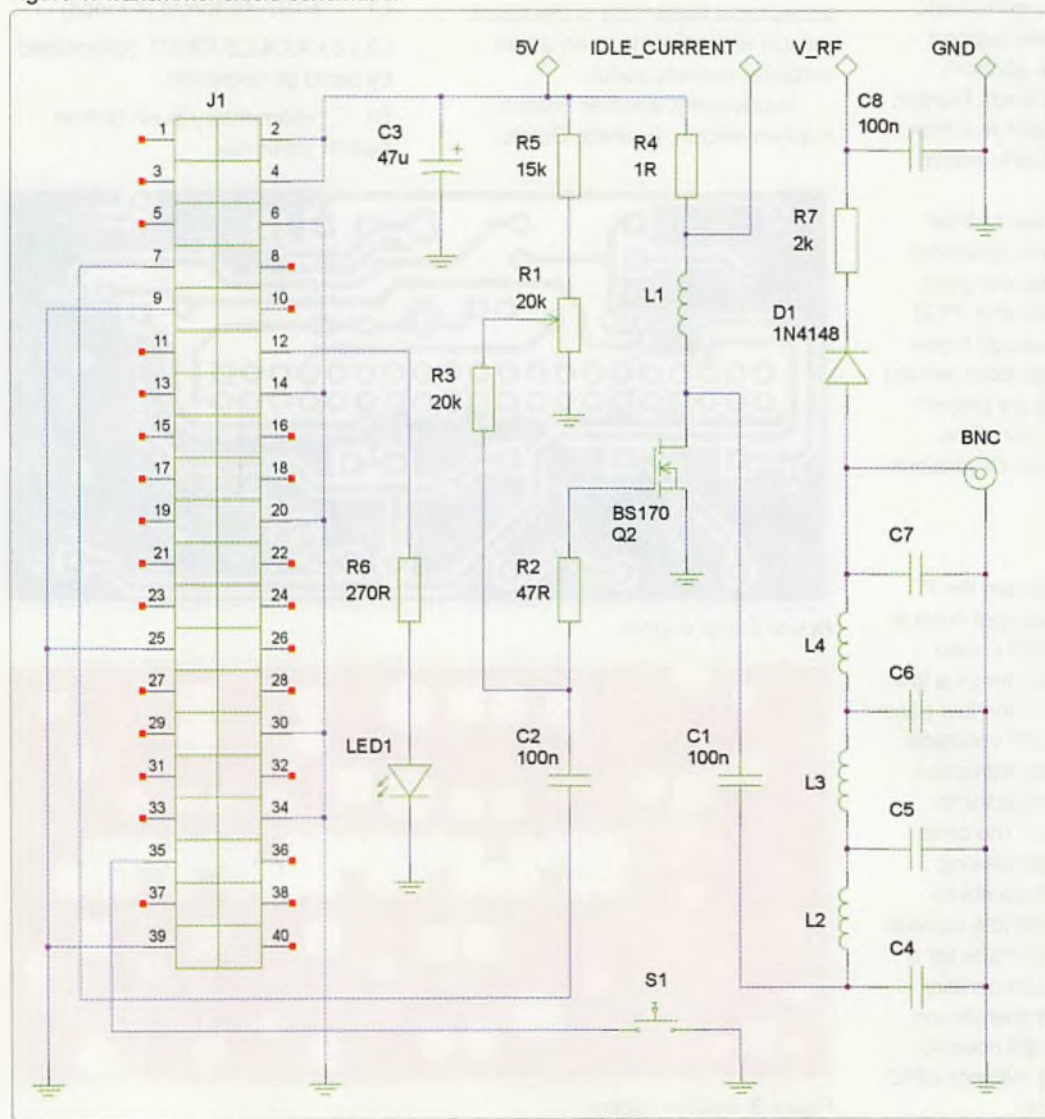
the Pi Zero W can run headless (i.e. without a monitor), and most importantly of all, enterprising programmers like Evariste Courjaud, F5OEO, have extended software support for arbitrary clock outputs derived from the internal graphic processing unit (GPU) clock to the Pi Zero W.

What this means is that a

Raspberry Pi Zero W, booting from a solid state SD Card and using the network time protocol (NTP) over WiFi for synchronisation and frequency calibration, can operate as a WSPR beacon (or more generally as a QRP signal source). All that is required is the addition of a simple plug in shield like the one described here and suitable software.

The design presented is based on one developed by Bruce Raymond, ND8I, for WSPR. Modifications have been made to the layout to eliminate routing on the underside of the board and to allow a more conventional BNC connector to be used. The layout was designed in the free and open source PCB layout

Figure 1: Transmitter shield schematic.



editor pcb-rnd, and design files have been made available, along with gerbers, for those wishing to have boards made, or who might perhaps wish to modify the design further.

The editor pcb-rnd is available as a package on Ubuntu and most other linux distributions, and can be built from source on most Un\*x flavours, including Mac OSX.

Pcb-rnd supports export (as well as import) to (from) various CAD formats including protel autotrax (mostly just to keep VK5TR happy :-), and KiCad, as well as supporting industry standard Gerber outputs.

For those planning to home etch, postscript, eps, png and svg formats are supported. The layout was simple enough that it was designed without a netlist from a schematic editor, but pcb-rnd does support schematic import from gschern, xschem, eeschema (KiCad), Mentor, LT-Spice, TinyCad, Protel Autotrax, Calay and other schematic editor netlist formats.

The layout allows the builder to select inductors and capacitors to implement a suitable low pass filter for their intended band. PCB fabrication is cheap enough these days that 10 boards will cost around \$30 delivered, making the project ideal as a club project, or allow construction of a couple of versions for different bands.

## Circuit

The shield uses 5 volts from the Pi GPIO (General purpose input output) header to power a BS170 based buffer amplifier that then feeds a low pass filter. The output of the low pass filter supplies a simple RF voltmeter circuit for output power estimation, as well as the BNC connector for the antenna connection. The other components provide the biasing for the BS170, and test points for adjustment of the BS170 idle current. Provision has also been made for a "transmit" LED, and a momentary push button to cease transmission, but the software used will need to toggle and monitor the relevant GPIO pins for this functionality.

## Some Maths

The Raspberry Pi outputs a square-ish wave on GPIO4 (Pin 7) of the GPIO header. The mathematician John-Baptiste Joseph Fourier (1768-1830) determined that any periodic waveform can be represented as a weighted sum of sines and cosines of different frequencies. An extreme example is an infinite sum of a fundamental frequency and scaled, odd multiples of it to effect a pure square wave.

Why do we care? Well, the square-ish wave on the GPIO pin will have evenly spaced harmonics of diminishing amplitude above the fundamental frequency of interest, so we need to have a low pass filter to reduce these harmonics to an acceptable level. This is the same reason why clipping in an audio amplifier sounds awful.

Incidentally, another French mathematician, Evariste Galois,

who tragically died in a sword fight, remains relevant today thanks to his insights into Galois fields, which underpin the forward error correction that WSPR relies on for low signal to noise ratio robustness.

## Components

Q2	BS170 x1
C1,C2,C8	100n
C3	47uF
R1	20k trimpot
R2	47R
R3	20k
R4	1R
R5	15k
R6	270R
R7	2k
LED1	LED x1
D1	1N4148 x1
L1	FT37-40 toroid (4 loops)
L2,L3,L4,C4,C5,C6,C7	determined by band of operation
S1	momentary push button switch (optional)

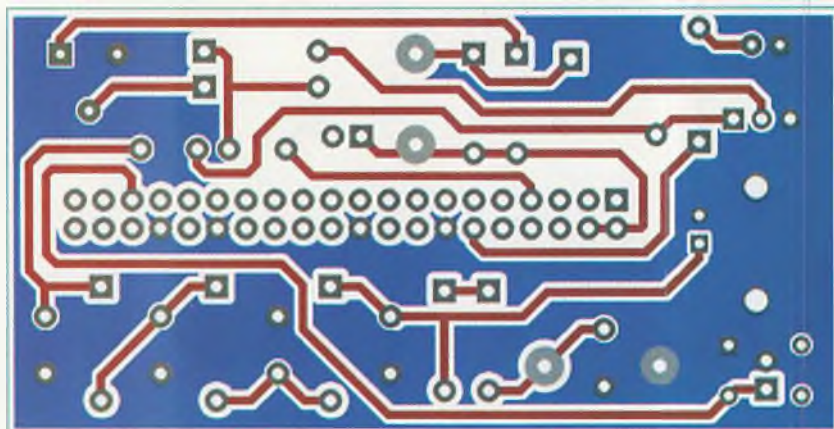


Figure 2: Top copper.

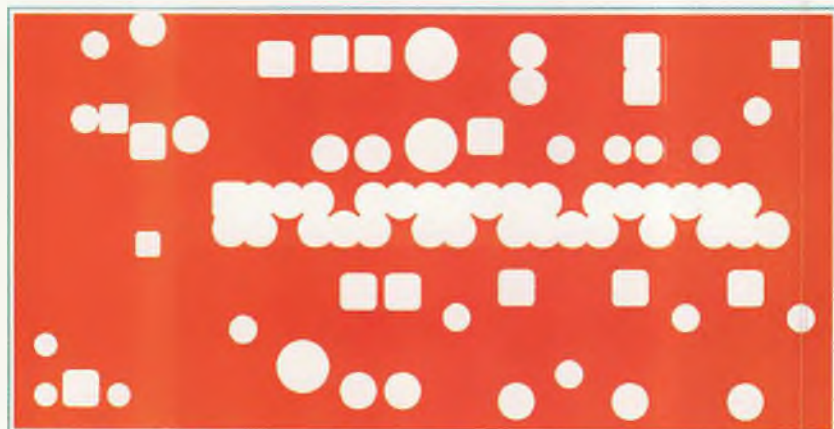


Figure 3: Bottom copper.



BNC right angle BNC connector  
J1 20x2 0.1" header  
microSD card, at least 4GB, x1  
Raspberry Pi Zero W x1 (Aztronics)

## PCB

The PCB is double sided, and the layout is shown in Figures 2 and 3. The board is 74.3mm by 38.2mm in size. Gerber files for manufacture and the layout file are available in the [github.com/erichVK5/RPITxShields](https://github.com/erichVK5/RPITxShields) repository.

## Construction

The board is first populated with passives, then the connectors and switch (if used), taking particular care to mount the 20x2 header connector on the underside of the board. The BS170 and LED can be added last.

The toroid simply needs 4 turns of enamelled wire, with one turn defined as a pass of the wire though the middle of the toroid. The ends of the wires will then need to be scraped with a blade or sanded to allow soldering.

A five volt supply can be applied across to the 5 Volt test point and ground test point, and the idle current adjusted with the trimpot to effect a BS170 idle current of 30mA, achieved by confirming 30mV between the idle current test point and 5 Volt rail with a multimeter.

## Operating System Software

A standard Raspbian operating system image will need to be

written to a micro SD card for the Raspberry Pi to boot from. A particularly user friendly cross platform utility that allows boot images to be written is "Etcher".

See also:

<https://www.balena.io/etcher/>  
<https://www.raspberrypi.org/documentation/installation/installing-images/>

Once the image has been written to the micro SD card, the card can be inserted into the unpowered Raspberry Pi. The simplest way to configure the Raspberry Pi initially is to plug in a monitor, keyboard and mouse and power on the Raspberry Pi. Wifi credentials are most easily set using the raspi-config utility in a terminal window which can also be used to set the preferred boot mode, i.e. terminal mode or graphical desktop mode. It is recommended that a static IP address be allocated to the

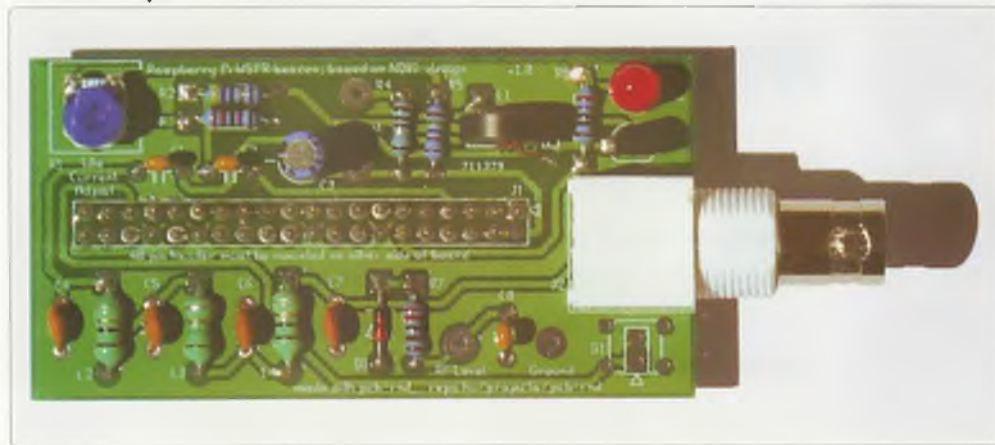
Raspberry Pi on your network router to facilitate subsequent access over the network. A user should be added for WSPR operations, such as "wspr" and a suitable password for the user selected. The ability to access the computer over SSH should also be set to on. You may struggle to add the Raspberry Pi to your wireless network if it is configured to refuse connection attempts from new wireless devices.

## WSPR software

Software for running a WSPR beacon on a Raspberry Pi has been around for some time, but changes that came with the Raspberry Pi Zero W mean that more recent code is needed for full support. At the time of writing, the most actively developed version of the software by F5OEO can be downloaded and installed in a terminal window as follows:

```
sudo apt-get install git
git clone https://github.com/F5OEO/WsprryPi
cd WsprryPi
git clone https://github.com/F5OEO/librpitx
cd librpitx/src
make
cd ../../
make
sudo make install
After this, the software can be invoked with
wspr [options] callsign locator tx_pwr_dBm fl
i.e.
wspr -r -o CALLSIGNHERE GRIDSQUAREHERE 23 20M
```

Photo 1: Completed shield.



The software should then establish the current time using the network connection, then wait until the next transmission window, and then proceed to transmit repeatedly with a random frequency offset applied to each transmission.

The Raspberry Pi can also be accessed over the network

with ssh from a terminal window. SSH allows a secure shell on the Raspberry Pi to be accessed over the network; i.e. it is a secure version of telnet.

```
ssh username@192.168.1.XX
```

Keen users can automate beacon startup after boot with a suitable rc script in the etc/rc directory.

At the time of writing, the addition of the following line to /boot/cmdline.txt is recommended in the Raspberry Pi file system to make operation more reliable

```
consoleblank=0
```

In addition, at the time of writing, you also need to add the following to /boot/config.txt in the Raspberry Pi file system

```
gpu_freq=250
```

New driver versions in the operating system can affect the operation of the code, and the software repository for whichever beaconing software is being used should be checked by builders for the latest errata. As a rule, older versions of the Raspberry Pi board are likely to have fewer remaining bugs.

Once the shield has been built, it can be carefully plugged into the Raspberry Pi header while the Raspberry Pi is off, taking particular care to ensure that pin 1 of the header connects to pin 1 of the



Figure 5: Spots on map.

Raspberry Pi. On the Raspberry Pi Zero W, the BNC end of the shield must be at the same end of the Raspberry Pi Zero W that has the MicroSD card socket.

### Results

Early results over 2 weeks on 20 m into a G5RV have been very encouraging, with spots as far as EABBFK in the Canary Islands, a distance of ~17000 km.

### Concluding remarks

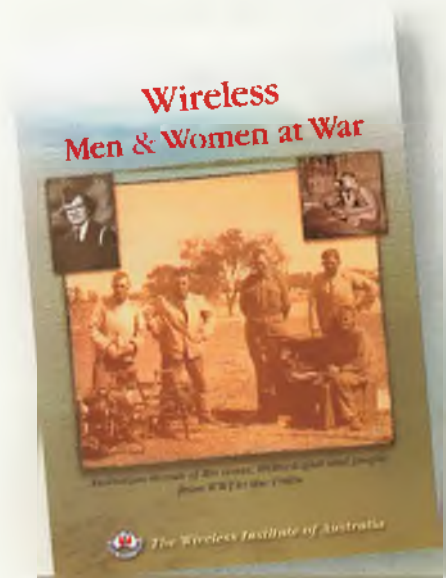
Although the focus of this article has been on a low power, compact WSPR beacon using the Raspberry Pi Zero W, the same shield and related software can also be used for SSTV, POCSAG, SSB, transceiver LO generation, NBFM and even WBFM transmission,

provided that appropriate low pass filtering and software is used. Those interested should explore F5OEO's github repository. F5OEO has refined the GPU clock output code in librpix such that it allows frequencies to be generated

from 5 KHz up to 1.5GHz to be generated. The various versions of the Raspberry Pi, in combination with clever code and a suitable shield, have the potential to be very versatile tools in the shack.

### Links

- <https://www.raspberrypi.org/downloads/raspbian/>
- <https://www.raspberrypi.org/documentation/installation/installing-images/README.md>
- <https://www.balena.io/etcher/>
- [repo.hu/projects/pcb-rnd](https://repo.hu/projects/pcb-rnd)
- [repo.hu/projects/xschem](https://repo.hu/projects/xschem)
- [github.com/F5OEO/WsprryPi](https://github.com/F5OEO/WsprryPi)
- [wsprnet.org](https://wsprnet.org)
- [github.com/erichVK5/RPiTxShields](https://github.com/erichVK5/RPiTxShields)



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# UTC Real Time Clock

Geoff Combes VK4GWC

I have always wanted an accurate clock in the radio shack that showed UTC and did not require resetting every time its power supply was interrupted. This small and easy project provides an answer. It was published originally in the club newsletter and, to my surprise, within a few weeks I learnt that three had been constructed by club members and friends.

A search of the Internet revealed that there are many designs for a clock based around the real time clock module DS3231 and an Arduino UNO or NANO.

However, I discovered that most had lengthy Arduino sketch codes and used LCDs requiring many leads. More searching found the simplest solution:

A blue LCD with I2C backpack

and sketch code written by Henning Karlsen using his library that does it all.

The circuit diagram is shown in Fig. 1. It has only three electronic components:

- Arduino UNO microprocessor. The Arduino NANO can also be used.
- Real Time Clock module, type DS3231

```
/* UTC Clock
G W Combes VK4GWC Using a DS3231 RTC and Arduino UNO
DS3231 Library made by Henning Karlsen which can be found and downloaded from his website,
www.rinkydinkelectronics.com.
*/

#include <Wire.h>
#include <DS3231.h> // includes DS3231 library.
#include <LiquidCrystal_I2C.h> // includes the LiquidCrystal Library
                          // DS3231 rtc(SDA, SCL);

// Declare which of the Arduino pins will be used for controlling the LCD
// 0x3F is the I2C bus address for the white-on-blue LCDs that I purchased
// from Banggood. The alternative is 0x27.
LiquidCrystal_I2C lcd(0x3F, 2, 1, 0, 4, 5, 6, 7);

// Setup Display and RTC
void setup() {
  // Initialize the rtc object
  rtc.begin();

  // Set Day-of-Week to FRIDAY. Day 1 is SUNDAY and remove '/'
  //rtc.setDOW(6);

  // Set the time to UTC (24hr format) and remove '/'
  //rtc.setTime(05, 33, 00);

  // Set the date to November 13th, 2016 and remove '/'
  //rtc.setDate(05, 04, 2019);

  // Initializes the interface to the LCD screen, and specifies the
  // dimensions (width and height) of the display.
  lcd.begin(16, 2);

  // Make sure the LCD stays on
  lcd.setBacklightPin(3, POSITIVE);
  lcd.setBacklight(HIGH);
}

// Main Loop
void loop() {
  lcd.setCursor(0, 0);
  lcd.print("UTC: ");
  lcd.print(rtc.getTimeStr());
  lcd.setCursor(0, 1);
  lcd.print("Date: ");
  lcd.print(rtc.getDateStr());
  delay(1000);
}
```

- LCD 16 character x 2-line with an I2C backpack

In addition a box, some hardware and a 5 volt power supply are needed; more on those later. My finished UTC Clock complete with separate power supply is shown in *Photo 1*.

Arduino sketch (see Source (1) below)

The Arduino sketch (code) is uploaded using Arduino's IDE.

Those unfamiliar with using this software should get help from a club member who knows.

The downloaded sketch required some additions to make it work.

The first are three instruction lines to program the RTC, and the second are two lines that make sure the LCD backlight remains on.

The complete sketch is shown below It is also provided by the author - see source (2).

### Notes on the sketch

1. If you are not familiar with the Arduino IDE and the structure of the Arduino sketchbook folder you will need advice from others. To avoid ambiguity with the liquid crystal library I recommend that you use only one with the folder name 'NewLiquidCrystal' and delete all others from the libraries folder.
2. The address for the RTC module is contained in the liquid crystal library.

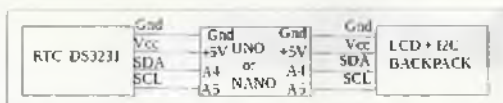


Figure 1: UTC clock circuit.

3. The address for the LCD may be either 0x27 or 0x3F.

If one doesn't work the other will.

4. 'Change the source code so that the "rtc.setTime", "rtc.setDate" and "rtc.setDOW" represent the time and date a few minutes from the current time (use your PC time as a reference) and remove the comments "//" prior to uploading the sketch

When uploading is done you will see the LCD displaying the time as it passes. Replace the comments "//" in front of each rtc.set line of code and upload again.

Programming the Arduino and RTC is now done.

### Construction

Many readers will have no difficulty putting the three components in a box and providing a 5 volt power supply.

For those who would appreciate some suggestions on construction I present here the method I used.

The method is based on plugging together all three modules. (See exception below for UNO R3).

Here is a list of parts required for

this construction method:

1 x Arduino module, either UNO R3 or NANO.

I use the Geekcreit brand from Banggood.

1 x RTC DS3231 module complete with rechargeable 3.6V Lithium battery type LRI2032. Many on-line sources.

Some suppliers will ship with battery, others will not on safety grounds.

A CR2032 will last for many years.

1 x 1602 LCD white-on-blue with I2C backpack.

1 x 4 or 5 wire cable fitted with a female plug on one end.

Several on-line sources or make your own from parts.

8 solid brass hex spacers 5mm long, tapped 3M. eg. ebay - pack of 20 for \$2

2 x thin spacers 10mm long for mounting one end of UNO module.

Necessary but may be hard to find so improvise.

3M screws and nuts to suit spacers including 2 x 25 mm long screws for mounting one end of UNO module.

1 x piece of through-the-hole circuit board to make Arduino proto board.

Size of your choice. Ex Banggood et al.



Photo 1: UTC clock assembly.



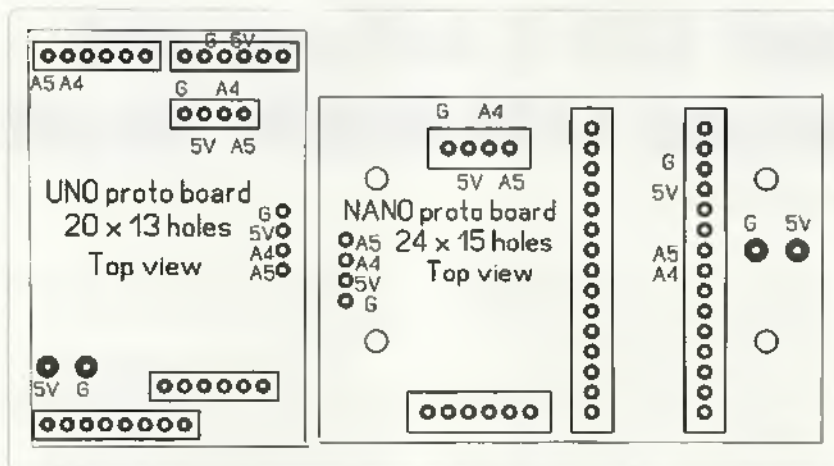


Figure 2: UTC clock photo boards.

Thin single core insulated copper wire for wiring above proto board.

1 x strip of female header for proto board.

#### From Banggood

1 x strip of male header for proto board. From Banggood.

The first step of construction is to make the proto board for the Arduino module.

There are two from which to choose - one for UNO and one for the NANO. They are shown in Fig. 2.

Follow the instructions on wiring the proto board provided in the package supplied by the writer (See Source 2).

After adding the four LCD cable connections make them stronger by adding a 3 mm plastic tie near the proto board.

When completed check for continuity of wires and for shorts between wires.

The finished wiring should look something like that shown in Photo 2 for the UNO proto board. The wiring of the NANO proto board is similar.

Next mount the Arduino module/ NANO assembly in the bottom of the box of your choice. For

the UNO the proto board comes after mounting.

The minimum inside dimensions of the box for the NANO is H90 x W60 x D42. For the UNO with plug-in RTC it is W90 x W60 X D60.

As D60 may be hard to find in a small box consider soldering the RTC to the proto board.

This reduces D(min) to 52 mm. Holes are required for the 5v leads and for access for the programming cable and in the lid for the LCD.

Both the LCD and the Arduino module/RTC assembly are mounted on 5mm long brass tapped 3M spacers.

#### Power Supply

The supply requires 5.0V at less than 200mA.

Many amateurs will have

ready-made supplies. If not then I recommend buying the switchmode 5VDC x 600mA supply enclosed in a tiny white plastic box from Banggood.

This is illustrated in Photo 1.

It is well-regulated, runs from 70 - 240VAC, provides short circuit and overload protection and is accurate (the voltage displayed in Fig.2 was accurately measured at 5.01V).

Also buy the 2-wire voltmeter from ebay (ca.\$1).

#### Sources

1. Henning Karlson [www.rinkydinkelectronics.com](http://www.rinkydinkelectronics.com)  
Download DS3231.zip for the library.
2. Geoff Combes VK4GWC [gcombes4@bigpond.com](mailto:gcombes4@bigpond.com), for a complete package of instructions, drawings and software files for the UTC clock. Send email with title 'UTC clock'.
3. Kit of parts as listed above plus package described in source 2. Excludes box. Select UNO or NANO. Pre-tested on a bread board.

Enquire at email [gcombes4@bigpond.com](mailto:gcombes4@bigpond.com) with title 'UTC clock kit'.

#### The Author

Geoff is an engineer (BEHons UWA 1959) who studied radio and electronics in Perth and privately since.

He qualified for an amateur radio

licence in theory and regulations in 1962, morse in 1967. He obtained a radio licence in 1988 with callsign VK3BGC.

Geoff retired in 1993 with callsign VK4GWC, living on the Sunshine Coast, Qld where he has been a member of the Sunshine Amateur Radio Club since.

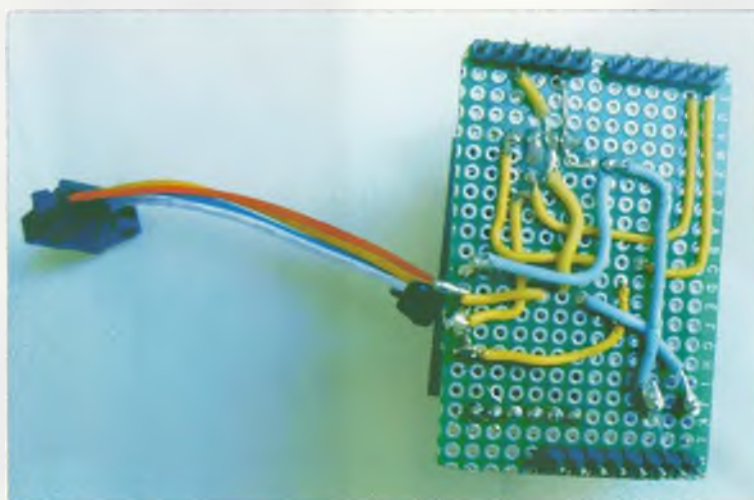


Photo 2: UTC clock UNO proto board underside.

## Equipment Review

# Comet SBB-5 Antenna and Diamond K416 Mobile Mount

Chris Meagher VK2ACD

### The choice

For many years my only vehicle has been an ex-army Land Rover Defender with a heavy bull bar and roof rack which is able to accommodate just about any kind of mobile antenna. Also, there was no problem in adding extra wiring and feeding cables through bulkheads.

Recently, though, I purchased a used Mazda 3 hatchback as I needed something suited to driving in city traffic, and wanted to save the Defender for bush trips.

This vehicle is of course quite a different proposition in terms of mounting and style of an antenna. After looking through the huge

variety of 2 m/70 cm dual-banders available, I chose a Comet SBB-5. This was not the cheapest around but it had good reviews and a number of things in its favour: a moderate length (0.95 metres), reasonable gain (3 dBi/5.5 dBi), slim and light weight, an integral centre coil (no grub screws to come loose), satin black finish (for 'stealth') and a PL screw-on base for easy removal and a tilt-over base.

For the mount, I first tried a home-made contraption which attached under the rear bumper with a heavy steel bracket, spring base and PVC pipe upright. However this turned out to be a dud, as the antenna vibrated with

the vehicle in motion and the mount pipe interfered with opening the hatchback.

So I ruled out anything home-brew and went looking for a suitable commercial mount, a type that would fit over the lip of the hatch. Because of the angles involved it needed to be sufficiently adjustable to accommodate the angles involved. I chose the Diamond K416 3-axis adjustable angle boot/edge mount bracket, the medium size in a series of 3 available lengths.

As well, a PL base and lead set was needed. A low cost unit of good quality was sourced via eBay. This came with a decent length of RG58 cable, terminated in an FME



Photo 1: Close up of the 3-axis mount.



Photo 2: Routing the antenna cable down the hatch.



female connector so it could pass through a much smaller hole than a PL type.

### Fitting

The mount bracket went over the hatch lip, 200 mm down from the line of the roof. Three stainless grub screws secured it to the lip, requiring some care in tightening.

After fitting the PL base unit into the mount hole, the RG58 cable was fed down the drain channel of the hatch and held in place with some adhesive cable clips, over the rubber seal and under the hatch mat to the transceiver (Yaesu FTM-400) installed under the front passenger's seat.

No hole drilling was required. Some adjustment was needed to locate the cable so that it remained in place with repeated opening and closing of the hatch. The photos show the installation and you can see how with the hatch open, the antenna lies neatly horizontal just clear of the roof line.



Photo 3: The antenna lies horizontal with the hatch open.

### Testing

After checking for continuity and shorts, it was connected up for initial on-air tests, with good results on both bands. While still in the

garage (albeit a fairly open building), I was able to access the Lismore 2 m repeater 40 km away and Mt Nardi on 70 cm, at 68 km.

On then to analyser scans.

Again, good results, with decent SWR bandwidth.

### On the Road

The antenna has been faultless in performance on both bands. The mount needed some attention. After a few weeks, the grub screws on the bracket had loosened, the problem being related to an aluminium strip which fits in the 'channel' that goes over the lip of the hatch door. This was repositioned and all has been good since. I would recommend a regular check over though, just in case, especially if driving on unsealed roads.

The antenna is just high enough to clip some of those overhead height markers in shopping centres. But no harm has been done. The PL base has a tilt-over feature, which I don't use, though it could be handy for negotiating a car park with a very low ceiling.

Overall, in my opinion it's a great combination 2 m/70 cm mobile antenna for a small vehicle, for performance and aesthetics. Both antenna and mount were purchased at retail price from a well-known Australian ham outlet.

Figure 1: SWR scan 144-148 MHz.

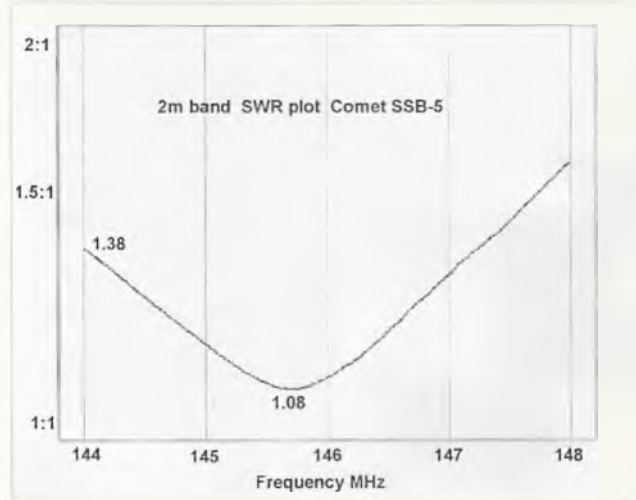
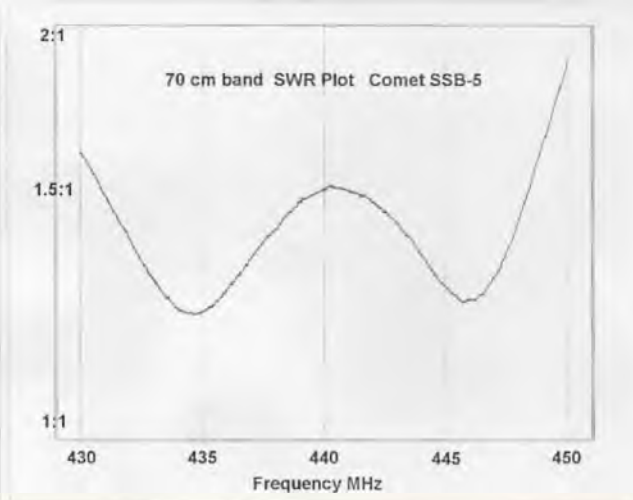


Figure 2: SWR scan 430-450 MHz.



# Equipment Review | HT-1A CW QRP Transceiver

James Hannibal KH2SR

The HT-1A is a compact 20/40m dual band CW QRP transceiver from CRKITS that comes in either kit form or fully assembled. I received the fully assembled model, so this review won't cover the kit building process. Even though I didn't build this one, I did take a peek inside. SMD components are used, but not to worry. All the SMD parts are pre-mounted, and you will only have to solder through hole components.

Measuring 4.33" x 4.09" x 2.32" and weighing in at only 400 grams (14.12 oz), the HT-1A is a great option for hams that enjoy portable operating in the great outdoors. It'd be a good fit for SOTA & POTA activations or even quick LTOTA deployments (Lunch Time On The Air).

It has a transmit range of 7.0-7.2 MHz and 14.0-14.35 MHz. Even though this rig only transmits CW, it does have the ability to listen to SSB signals. It also has an extended receive range, which covers everything between 5.9-16 MHz which means shortwave broadcast reception while in SSB mode. Filter bandwidth is set at about 300 Hz for CW and 1.8 KHz for SSB.



Photo 1: Front Panel HT-1A.

Spurious suppression is no worse than -50 dBc. I was impressed that the receiver is surprisingly sensitive considering the size and price of the radio. Using simple base loaded MFJ single band telescopic whip antennas with no counterpoise and no grounding, I was able to copy quite a few QSOs on 20m and 40m.

RF power output is 5 watts with 12 volts input power, but it can handle up to 15 volts. However, the

transceiver can be powered off a 9 volt battery in a pinch if needed. Speaking of batteries, this little guy even has room to install an internal lithium ion battery pack! Current consumption during receive is about 60 milliamps with the display backlight on and only about 45 milliamps when the backlight is off. During transmit, the HT-1A draws 1 amp.

No internal speaker is provided with the HT-1A, however there is plenty of room inside the enclosure to install a small speaker and audio amplifier. I used a tiny external LiPo powered amplified speaker and a set of headphones to keep things simple.

The HT-1A has some great features for such a small and affordable QRP transceiver. These include: 16 user programmable memory channels, built-in keyer

Photo 2: HT-1A in the field - Compact and very portable.







Photo 3: HT-1A Internals - Mix of SMD and "thruhole" components.

for iambic paddles, full break-in QSK, RIT, XIT, AGC, S-meter, and even side tone selection. The HT-1A can even automatically detect whether you are using paddles or a straight key. The built-in keyer is adjustable from 5-40 words per minutes and is set at 15 WPM by default.

I was able to easily fit it into a small rugged waterproof case along with a couple single band telescopic whips for 20m/40m, a small 12v LiPo battery, headphones, a MK-11 Pocket Spy Micro Straight Key, and a bulldog BD6 Mini iambic Key.

I had a blast with this compact QRP rig. It's just so easy and fun to use! With an interface consisting

of only 2 buttons, 2 knobs and an on/off switch, you can learn to operate the HT-1A in just a couple minutes and without ever reading the user manual. I think this ease of use makes it a great option for preppers who typically want a compact affordable emergency backup transceiver. Plus, you don't have to take much time to relearn the interface if you haven't used it in a long time.

The HT-1A from CRKITS should appeal to a wide demographic of ham enthusiasts, builders, beginners, preppers, SOTA, and especially the budget savvy ham crowd. If you fit into any of these categories, then I highly recommend

you take a close look at this great little dual band 20m/40m CW transceiver.

Kit Price: \$150 USD

Fully Assembled Price: \$175 USD

Available for purchase at the following links:

<http://crkits.com>

[https://qrvtionics.com/CatHAM\\_Radio/Products/HT-1\\_CW.htm](https://qrvtionics.com/CatHAM_Radio/Products/HT-1_CW.htm)

#### Technical Specifications:

**Chassis Dimensions:** 110 x 59 x 104 mm (not including protruding parts like knobs)

**Weight:** About 400 grams

**Power supply:** 9-15 V DC

#### Current consumption:

*During RX:* About 60 mA when backlight is on and about 45 mA when backlight is off

*During TX:* About 0.8 A (@ 12 V)

**Local oscillator:** DDS, reference frequency 54 MHz

**Display:** LCD

**RF output power:** About 5 W (@ 12V)

**RX:** 5.9-16 MHz continuous (peak sensitivity only in 40 m and 20 m bands)

**TX:** 7.0-7.2MHz and 14.0-14.35MHz

**Side tone:** 600 Hz

**Keyer:** Built-in, 5-40 wpm adjustable

**Memory:** 16 memories, user programmable

**RX mode:** CW, SSB (LSB only if it is below 10 MHz, and USB only if it is equal or above 10MHz)

**AGC:** Audio derived AGC with S-meter to show relative strength just for reference

**QSK:** Full break-in

**Spurious Suppression:** no worse than -50 dBc

**Filter bandwidth:** about 300 Hz for CW and 1.8 KHz for SSB

**Antenna Connector:** BNC

**Audio Connector:** 3.5mm

**Key Connector:** 3.5mm



# Balmy Bondi to Wintry Scotland

David Searle MM0HOD/VK2DWS/ZL3DWS

VK2DWS David, now MM0HQD, has finally retired in wintry Scotland. But, he's still keen to share the fun of amateur radio and basic electronics with Scottish school children. Many may recall his involvement in ZL3 Buildathon events in Christchurch NZ and becoming NZ Radio Amateur of the Year 2010 whilst living in Bondi.

A small group of hams and men shedders has been formed to deliver events and photos of the last four may be viewed at [www.CQScotland.com](http://www.CQScotland.com)

All projects are built on breadboards by the children. David would like to hear from you if you have any breadboard designs you think the children would find a lot of fun building.

He can be contacted at [info@cqscotland.com](mailto:info@cqscotland.com)



Photo 1: At end of session 4 all children received a certificate acknowledging what they had learnt and built.



Photo 2: A selection of spy sets.



Photo 3: "Can I set it to 8867khz so I can find out about granny's flight to Sydney?" (child is ZL3DWS granddaughter - Savannah 6).

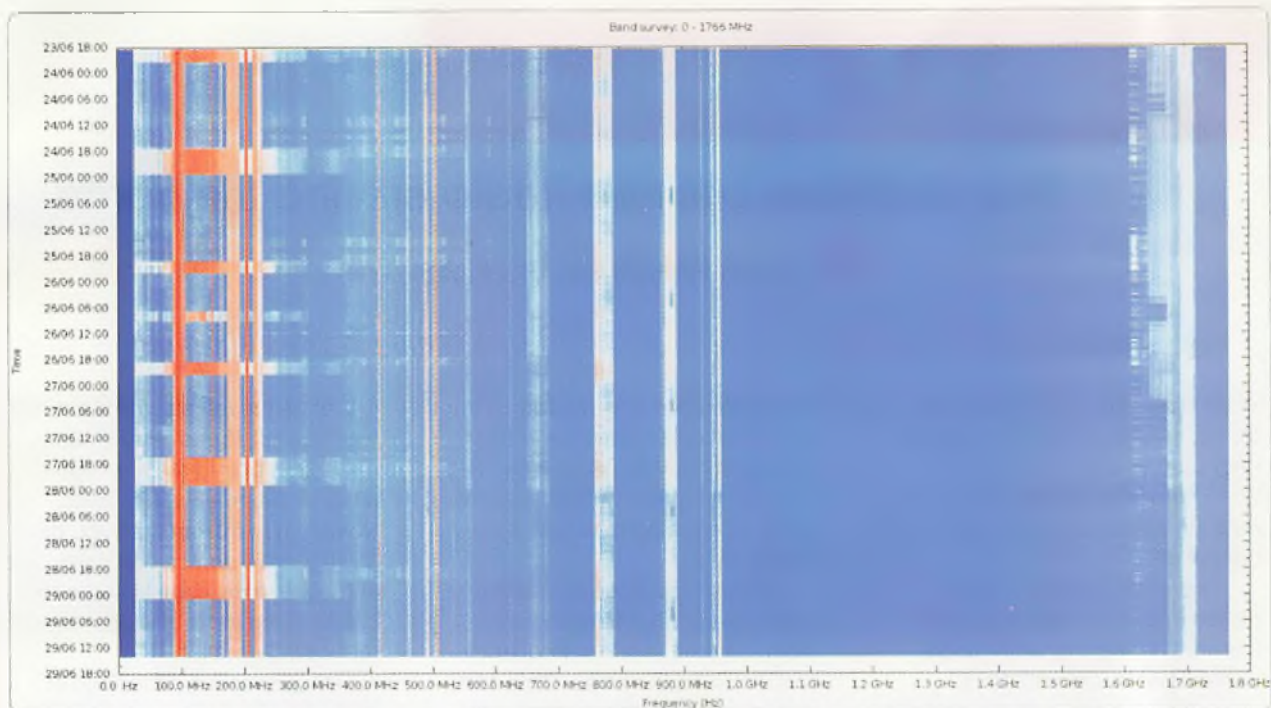


We are grateful for the support of the Radio Society of Great Britain, micro:bit Educational Foundation, Antex Electronics, Mid Lanark Amateur Radio Society, and Hamilton and District Men's Shed.

Photo 4: Hand is on genuine Eddystone AW2 used by the Secret Listeners, Paraset on top of a Whaddon made suitcase, next is a Russian set.







*Image 2: This band survey displayed in a more traditional waterfall shows the signal strength measured between 0 and 1766 MHz, every two minutes for 138 hours. It clearly shows recurring wideband interference from 18:00 to 21:00, likely a television.*

For my little investigation I started with measuring between 0 and 1.7 GHz, at 1 MHz intervals, every 2 minutes for 10 days. That creates a big CSV file that you can process with gnuplot into a picture that tells a thousand lies.

Seriously, it showed me that the interference was very wide, 0 to 300 MHz, it occurred every 20 or so hours, lasted up to six hours at a time. There were other things happening as well, similar patterns, but across an even larger frequency range, from 0 to 600 MHz, but in shorter duration and of lesser strength.

Based on the times alone, I can immediately, almost certainly, eliminate any source under my control.

Based on the timings I can also determine that the noise is likely not created by an automatic process, given that they vary in duration and the way they're clustered around specific times.

The variation of the interference allows me to determine that there are at least three separate types of noise, each with specific

characteristics and times, sometimes overlapping.

It's too early to tell if this pattern will continue. One possible next step is to set up the same measurement tool and powering it from a battery. Once I've got that working, I expect to turn off the house power during an interference session and determine if the noise is coming from my house, or if it's an external source, which seems likely.

Once I've determined if it's in house or not, I can start either eliminating gadgets by switching off specific power circuits, or I can start direction finding and locating a nearby source of pain.

At that point I can decide what to do next. That said, at the moment it looks like several televisions around me are creating an RF noise storm of epic proportions.

I've documented all of how I did this and you can find it and the scripts I created on the projects pages at [vk6flab.com](http://vk6flab.com).

One thing that has happened since I started documenting my efforts is the idea that we could

collectively as a community make measurements like this and document the state of our RF space and how it changes over time. I plan to update my code to incorporate this idea, perhaps log in 24 hour blocks and generate a chart over that time, perhaps make it into a video.

One challenge ahead of us would be to come up with a universal way to calibrate our various dongles, so we all report the same signal level in the same way. One thought is to use the sun as a global calibration, but I'm not yet sure how that might be implemented.

One thing's for sure. If you've ever wondered what use can a \$5 RTL dongle possibly be, this is one thing that you just cannot do with a traditional radio. That's not to say there's a place for both in the world, just different tools for different problems.

I'm Onno VK6FLAB

*This article is a transcript of the weekly "Foundations of Amateur Radio" podcast.*





Onno Benschop VK6FLAB

### About Onno Benschop

As a presenter and producer in community radio stations in Perth during the 1990's Onno gained much experience in interviewing people, presenting information and relating to an audience. Starting in 1990 at 6UVSfm, then 92.1 RTR-FM, 990 Information Radio and Curtin Radio 927 6NR, Onno produced many hours of on-air content, including some 1600 radio interviews. Many of

those were conducted live for "Online Computing Radio", a nationally syndicated technology show originating at 6NR and distributed live via the Community Broadcasting Association of Australia (CBAA) satellite network.

In December 2010 Onno was licensed as a radio amateur with callsign VK6FLAB. After becoming licensed, Onno rekindled his broadcasting spirit when he started to contribute to the VK6WIA

weekly amateur radio news in Western Australia. Heard every Sunday across a range of stations, a recurring segment "What use is an F-call?" documented the journey of a fledgling radio ham. Eventually this weekly segment was rebroadcast on the VK1WIA National Wireless Institute of Australia news.

In 2015, "What use is an F-call?" was renamed to "Foundations of Amateur Radio" in preparation for distribution to a wider audience, both beyond Amateur Radio and beyond Australia. It is downloaded by thousands of listeners every day.

Since 2017, seven volumes of the eBook "Foundations of Amateur Radio" were produced and are now available for sale on the Amazon Kindle store. Volume 8 is currently in production.

Onno is a professional technologist (geek) who is able to speak about a topic in such a way that the audience can follow what is going on. Feel free to get in touch directly via email: [cq@vk6flab.com](mailto:cq@vk6flab.com), follow on twitter: [@vk6flab](https://twitter.com/vk6flab) or check the website for more: <http://vk6flab.com/>



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## Have you registered for MEMNET yet?

Go to [www.wia.org.au](http://www.wia.org.au) click on 'For Members', then click on 'Log into MEMNET', and register... it's very simple.

If you have already registered for MEMNET but have not received a confirmation Email we may not have your correct email address.

Please email [memnet@wia.org.au](mailto:memnet@wia.org.au) with your email address, name and membership number.

If you are changing your email address, please *remember to update* your information in MEMNET.

# WIA Annual Conference

Justin Giles-Clark VK7TW

## Club Executives Gathering

The conference weekend began with the Club Executives gathering on the Friday afternoon with over 20 people attending from clubs all over VK and every state and territory was represented.

Director Aidan Mountford VK4APM started proceedings with a sobering assessment of where the hobby is at and some of the things the WIA has been actioning. This led to broad discussion about many aspects of the hobby.

Some of the key themes that were taken away from the discussions included:

- This hobby has so many diverse aspects - how do we aggregate all these different activities under an umbrella called amateur radio to show the community what a great hobby this is and it may not be called "amateur radio"?
- Better marketing similar to the Men's Shed movement with emphasis on the social value to the community - need a clear statement of purpose, a master pitch that infiltrates everything.
- How do we tap into the STEM/STEAM grants and the maker and hacker movements.
- Improved communication and marketing of the hobby - this is where the WIA adds value.
- How can the hobby contribute to a person's education, occupational pathway, training and development?
- The WIA acting as a clearing house for great stories involving the hobby and packaging them up for the professional media channels.
- Identify and share the best-of-breed clubs and their activities with the community.
- Demonstration of the net social benefit this hobby contributes was a reoccurring theme during the meeting.



Photo 1 - Dr. David Dufty with the keynote presentation at the Sydney Town hall. (Photo courtesy of Justin VK7TW)

The Board thanks all who took the time to come along the Club Execs Gathering and share their experiences.

## Waverley Amateur Radio Society Centenary

The Friday night saw the celebration of the centenary Waverley Amateur Radio Society (WARS). This was held in the Marconi Room of the Sydney Town Hall. Waverley was formed in 1919 in the Eastern Suburbs of Sydney and continues to be an active club catering for a variety of activities relating to amateur radio and electronics.

John Buckley VK2LWB and John Harper VK2LJ took the audience through the early years of the Waverley club. They then introduced Dr David Dufty who is the author of the book - "The Secret Code-Breakers of Central Bureau - How Australia's signals-intelligence network helped win the Pacific War".

David outlined the part that radio played in Central Bureau and the decrypting of intelligence

information from the Japanese leading to key victories in the Pacific theatre during World War 2.

David then focused on the part that Florence Mackenzie - Mrs Mac played with supplying the Morse code operators that received and transmitted those encrypted signals.

The Centenary Celebration finished off with an audio message from the ghost of Guglielmo Marconi wishing the Waverley Club best wishes.

A huge thank you to the Waverley Amateur Radio Society for hosting the night and happy centenary.

## Annual General Meeting and Open Forum

The Annual General Meeting was held on the Saturday morning and was completed relatively quickly with the following items of note. In the silent key tributes it was noted there were three WIA Life Members - Jim Linton VK3PC, John Adcock VK3ACA and Joe Gelston VK7JG. The President's report noted the significant outlay in 2019



to send representatives to World Radio Conference, addressing the membership decline and that the WIA not being successful in tendering for the ACMA assessment and call sign services and that the Board considers this to be a lost opportunity with no net community benefit.

The Director's report including the Financial and Audit report was presented and accepted by the members. These reports are available on the WIA website for members. The WIA returned a surplus of \$23,134 following a deficit of \$75,962 last year. In summary in 2018 there were 25 Nominated Assessors, 221 Assessors and 51 Learning Facilitators. 930 assessments were undertaken, 215 upgrades were undertaken, 608 Certificates of Proficiency issued; and 1100 call sign recommendations were made.

The election of the new and returning Directors was announced with new Director Mike Alsop VK8MA and returning directors Greg Kelly VK2GPK & Peter Clee VK8ZZ. Mr John Marshall was appointed as the Returning Officer.

The following Merit Awards were presented:

- GA Taylor medal was presented to Phil Wait VK2ASD, for services as President and Director of the national WIA for 14 years.
- Michael Owen Distinction Medal for 2016 was presented to Peter Wolfenden VK3RV, for services to amateur radio in relation to the preservation of amateur radio history in Australia.
- Ron Wilkinson Achievement Award was presented to Jim Tregellas VK5JST for the design of an affordable antenna analyser kit that has been built all over the world.
- The following amateurs received Technical Excellence awards:
  - David Minchin VK5KK, Tim Dixon VK5ZT, and Iain Crawford VK5ZD for work in GHz experimentation and

record setting

- Rex Moncur VK7MO for Digital weak signal Earth-Moon-Earth experimentation and record setting in the GHz bands
- The following amateurs received President's Commendation awards:
  - Michael Welsh VK2CCW for dedicated and disciplined support of the hobby, in particular the promotion and teaching of CW over many years.
  - Will McGhie VK6UU for services to the History and Archives Committee in scanning in copies of AR Magazine from 1933 to 2012.
  - Bob Robinson VK3SX for service to the WIA and the amateur radio community as Awards Manager for many years.
  - Graeme Scott VK2KE for developing amateur radio study guides and contribution to the VK3 Education Committee.
  - Dr Sasi Nayar VK5SN - long term trainer and WIA assessor for Amateur radio community in VK5.
  - Paul Hoffman VK5PH - long term involvement with the Scout Electronics Team and contributions to the Amateur radio community in VK5.
  - Barry Williams VK5BW - long term involvement in the promotion of amateur radio through the Adelaide Hills Amateur Radio Society and contribution to the Amateur radio community in VK5.
- Publications Committee Awards:
  - *Al Shawsmith Award* went to Joseph Stephen VK5JKS for the best non-technical article published in 2018: Joseph Stephen VK5JKS for his article "The challenges of hamming blind" published in the March - April 2018 issue of *Amateur Radio*
  - *Amateur Radio Technical*

*Award* went to Dale Anderson VK4NBX for the best technical article published in 2018: Dale Anderson VK4NBX for his article "An alternative and affordable antenna elevator type mast" published in the January - February 2018 issue of *Amateur Radio*

- *Higginbotham Award* went to Joe Gonzales VK3YSP and Julie Gonzales VK3FOWL for the strong promotion of amateur radio to younger people through the School Amateur Radio Clubs program together with their many activities in the broader amateur community encouraging amateurs to engage with youngsters.

There were 29 Long Service Awards presented to Nominated Assessors, Assessor and Learning Facilitators. There was a vote of thanks given to all Committee Members, Nominated Assessors, Assessor, Learning Facilitators and volunteers of the WIA.

After refreshments the Open Forum was held with many interesting topics discussed. Some highlights were - WIA value adding ideas, Brian VK2GCE presented an analysis of the membership statistics over the last few years, Men's shed organisations demonstrate how they add social capital to the community and get substantial grants - why can't amateur radio? Given there are more than 15K amateurs all over Australia - why is the WIA not pursuing political lobbying and the Ombudsman? The need for media ready marketing material being pushed to the media streams all the time to raise the profile of amateur radio with the community.

The Board has noted these suggestions and question and will consider them at future Board meetings.

## Presentations

Following the WIA Open Forum, lunch was served and then there were two streams of presentations provided for attendees. The first stream centred on policy and regulations and the second stream focused on interesting activities in the hobby of Amateur Radio.

### Stream 1

- **Liz Billiau VK2XSE** presented on the Past Present and Future, Education with the WIA
- **Tony Monger VK2KZ** covered the process of data collection from scientific CubeSat missions by Amateur Operators around the world.
- **Dale Hughes VK1DSH** presented on what constitutes the amateur service and covered that the amateur service depends on a relatively small number of documents and regulatory provisions that underpin its national and international existence.
- **John Buckley VK2LWB** and Peter Twartz covered a presentation titled RF in confined spaces - frequency management at large sporting events.



Photo 3 – Professor Fred Watson keynote on the Moon and Apollo missions (photo by Justin VK7TW)

### Stream 2

- **David Rowe VK5DGR** with a FreeDV 700D & 2020 Update
- **Andrew Davis VK1DA** covered Summits on the Air
- **David Minchin VK5KK** presented the Epic VK Microwave Tour
- **Jamie Campbell VK2YCJ** presented Secrets of the KiwiSDR

A huge thank you to all presenters

for sharing their time, skills and experience with conference attendees.

### Conference Dinner

Following all the activities on Saturday there was a wonderful Conference dinner held at the Park Royal Motel Function Room. Our MC for the night was John Buckley VK2LWB from the Waverley Amateur Radio Society and John did a great job entertaining everyone and introducing our keynote speaker - Professor Fred Watson AM. Fred is the "Astronomer at large" at the Australian Astronomical Observatory (AAO).

Fred gave the dinner guests a very entertaining presentation about the Moon and the Apollo Missions to the Moon. There was some great historic footage and some great stories about his studies and interests and distant involvement in the moon missions.

Fred commented that he felt he was among friends - with a similar group of radio enthusiasts! His brother was into radio when Fred got into astronomy.

Fred's last responsibility for the night was to draw the conference prize of an ICOM IC-7300. The lucky recipient was Garry Sewell VK2GLJ.



Photo 2 – Collage of presenters at the WIA Conference Weekend.





Photo 4 – Collage of items from the day at Dural (photo by Justin VK7TW).

Congratulations to Garry.

### Sunday Activities

About 30 people boarded the express bus from the Park Royal Motel to the ARNSW facility at Dural for a Sunday of activities to finish off the 2019 WIA Annual Conference weekend. There were met by many people already at Dural trading, setting up for broadcasts and setting up display tents.

There were exhibitors from:

- St George ARS
- Manly-Warringah ARS

- Blue Mountains ARC
- Hornsby and District ARC
- ALARA (Australian Ladies Amateur Radio Association)
- WICEN (Wireless Institute Civil Emergency Network)
- CREST (Citizens Radio Emergency Service Team)
- SOTA (Summits on the Air) and
- ARNSW Homebrew Group

We thank all the clubs and organisations that came along and exhibited on the day.

There was a great lunch provided by ARNSW and after this

lunch there were two presentations given. The first by Rob VK2DIO on AllStar Linking and Single Board Computers and the second by Alex VK2PSF entitled Digital Voice Update 2019. There was also quick address by the new WIA President - Greg Kelly VK2GPK.

We look forward to seeing you in Hobart, Tasmania for the WIA Annual Conference Weekend on the 8-10 May 2020. Keep your eyes on the WIA website for details and early bird bookings.



# “70th Urunga Radio Convention” 2019

Ken Golden VK2DGT

The Easter “Urunga Convention” has operated continuously since 1949 at the Doo Mee boat shed (now Anchors Wharf) and in that time has been supported by local and visiting amateurs. Some are not with us today but many still remember them. To name a few early identities involved in URC: Crief Retalick VK2XO, Jack Gerard VK2ADN, (Tasma Theatre) Leith Martin VK2EA, Peter Alexander VK2PA, Brian Slarke VK2ZCQ, Max Francis VK2BMK, Arnold Austin VK2ADA and current committee members.

The weekend looked like it was going to be wet but the showers held off and was well attended by visiting and local “Fox Hunters”.

The 70<sup>th</sup> Cake was cut by June Austin XYL of (Arnold VK2ADA SK.) assisted by Arthur Monk VK2ATM.

Slides and Videos of past Conventions were run on and off during the weekend.

The Dinner at the “Ocean View Hotel” on Saturday Night was very popular (in the early days URC ran some of the early Conventions from there).

The Fox hunting fraternity’s support over the years has been appreciated and the dedicated efforts of past and present amateurs and the “Committee” have helped to keep it going. Some Visitors spoke in appreciation of the efforts of the URC committee

Trophies were presented for all events;

The “Arnold Austin Award”; Jeff Pages VK2BYY presented by Brett Austin

“Brian Slarke Award”; Overall, two days, Darian Panter VK3FAST. (Victorians did well.)

Past members of URC and CHADARC made the trip from QLD for the Celebrations; Len and Inge Christensen VK2BLZ.



Photo 1: Night OR Fox Hunt Rodney, Rod, Cameron, Chris, Gerard, Monika, Darian, Bryan Ackerly VK3YNG, Winner night hunt).



Photo 2: Pedestrian Hunt 2 mtrs. multiple Foxes.



Photo 3: URC Committee.





Photo 4: Paul Mainey VK2YX, with enthusiastic young Fox Hunters.



Photo 6: Ken Golden VK2DGT, Brian Starke Overall, Darian Panter VK3FAST, Bryan Ackerly VK3YNG, Monika FFAB, Rod, VK3FRCS.



Photo 5: Brett Austin presenting Arnold Austin Award to Jeff Pages, VK2BYY.



Photo 8: Arthur Monk VK2ATM, June Austin, (cutting 70th Cake) XYL of Arnold Austin VK2ADA, (SK).



Photo 7: Saturday night Dinner Ocean View Hotel, from left Bryan, Rod, Jeff, Kevin, Gerard, Darian, Monika, Rodney.

Keen interest by some local youngster's to Amateur radio was encouraging.

The night "OR format, 6 small foxes on different frequencies, with new multi frequency sniffers and foxes, designed by "Brian Ackerly VK3YNG" a favourite, the fox in the tree kept them guessing.

Who remembers the early days with single foxes, and then timed Foxes with alarm clocks and logic switching, designed by Merv VK2DMS, a big leap forward for the time. Now multiple foxes raise the bar a bit.

Thanks to all Amateurs and Loyal Sponsors for their support in celebrating the "70<sup>th</sup> Urunga Radio Convention."

Ken Golden VK2DGT  
President URC. 2019



# VHF/UHF - An Expanding World

David K Minchin VK5KK

## Introduction

This month we have a report on VK 122 GHz records tumbling in both VK3 and VK4, the Friedrichshafen Ham Radio 2019 fair, an update on the IC-9700 as well as Kevin VK4UH's ever popular Meteor Scatter notes.

## 122 GHz Australian Records tumble!!

The recent 122 GHz activity with distance record breaking activity has continued since the last issue with efforts from both VK4 and VK3. In the last issue, I reported the 21 km contact between Stefan VK4CSD and Roland VK4FB had just occurred. This contact was eclipsed shortly after the issue went to press with a 31.9 km contact on the 5<sup>th</sup> of May, 2019.

Later in May, the Dewpoint in South-East VK4 dropped to single digits enabling Stefan and Roland to extend the record out to 41 km, then ultimately to 43.2 km on 31/5/2019 to set a new National and VK4 distance record. One 6/6/2019, VK4FB and VK4CSD also extended the long standing VK4 90km 76 GHz record (VK4OE to VK4REX) to 115.9 km. The 122 GHz distance record in VK was now up there in the "world class" area. The world record was around 55 km in 2010 and the current world record of 132 km was set in 2013 between Wolfgang OE3WOG (now OE4WOG) and Rudi OE5VRL. But this VK record was only to stand for a few weeks ...

Meantime in VK3, Andrew VK3CV has been busy working on

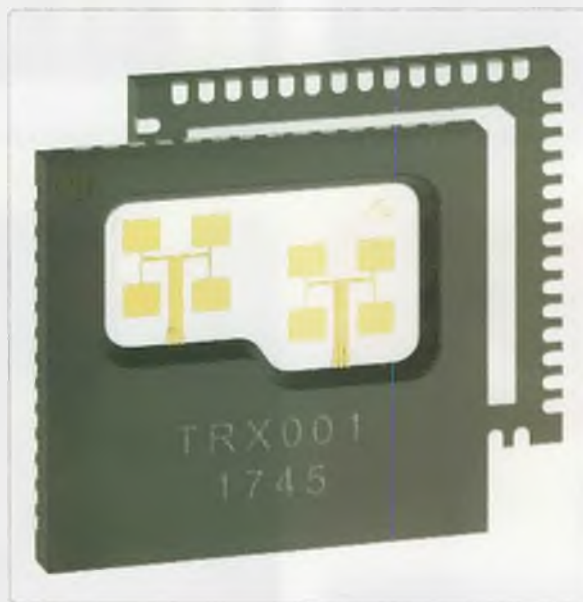


Photo 1: Silicon Radar 122 GHz Chip with RX and TX patch Antennae.

a different equipment approach for 122 GHz using an RF module designed for close proximity radar. Silicon Radar GmbH in Frankfurt, Germany is a company that specialise in small quantity production of ASIC design with capabilities of producing chips to operate up to 300 GHz. More recently they have developed a number of "Radar" chips for 24 and 60 GHz ISM bands in a small 8 mm x 8mm footprint. Late last year they introduced a new transceiver chip for 122 GHz in the same footprint using separate Rx and TX patch antennae in the top of the chip! The two antennae are separated by 4 mm, each having a gain of around 10 dBi. The advantage of the chip mounted antennae is that there is no external 122 GHz circuitry required. All connections

to the chip are DC to 2 GHz (IF and PLL Prescaler pins) that can be easily handled by conventional FR4 PCB material. For radar use a small synthetic "Fresnel lens" is available that focuses the beam into a narrow footprint. For Amateur use, the chip can be simply mounted at the focal point of a dish!

The power output of the chip is around 0.5 mW (-3dbm) so very similar to that of a MA4E 1310 diode multiplier (-6 to +1 dbm). However, the distinct advantage of this chip is that it has an active receive LNA with a typical noise figure of 10 db. To put that into perspective the noise figure of current diode mixers being

used on 122 GHz is in the region of 25 to 32 db! It is fairly clear what the new standard will be from now on!

There are still a range of technical issues to get around to use a chip for narrowband work on 122 GHz that was originally designed radar applications with a receive bandwidth approaching 1 GHz. Andrew has been progressively working distances from few km in March 2019 out to 17 km in late May 2019 setting a new VK3 record. More recently Andrew reports ...

*"Earlier this week (24/6/2019), the VK3 weather conditions finally turned in our favour and we've managed to obtain a much more substantial distance from our 122G equipment. Early in the day we made contact from Mt Dandenong*





Photo 2: Andrew VK3CVI/3 on 122 GHz at Kangaroo Ground.

(VK3NH/3) to Kangaroo Ground (VK3CVI/3) at approx 19km with signals peaking up to 5x9, then as the barometric pressure and humidity were dropping we pushed out the distance to what we calculate at over 59km from Mt Dandenong to Pretty Sally Hill near Wallan."

"A lot of QSB was evident on the longer path going from unreadable to peaks of 5x3. This goes well for us pushing it out even further. A couple of pictures attached. Thanks to Karl VK3LN for finding the very suitable Pretty Sally Location."

Given the challenges of 122 GHz with 1 to 2 db per kilometre path loss, 59 km is significant step up in distance. What makes this distance even more noteworthy is that narrowband FM

was used! Worldwide there have been very few contacts greater than this distance; the eyes are now on VK.

Photo 3: Scope view of Mt Dandenong from Kangaroo Ground.



## Friedrichshafen and a visit to OE9ERC

I attended the Friedrichshafen "Ham Radio" fair again in Germany late in June 2019 along with a number of other VK amateurs from VK1, VK2, VK4, VK5 and VK6. It is clear from comments from other VK's that this event has now eclipsed the "Dayton" event held in May for depth and breadth of content, especially for those interested in VHF and above. This year attendance set a new record of over 21,000 over the 3 days. The SDR conference was held on the Saturday with the key presentation done by Joe Taylor W1JT to a packed lecture theatre.

After the first day (Friday), I was invited along with several other amateurs to go for a drive to Austria to visit Erich OE9ERC's EME station in the mountains behind Bregenz. His QTH is about 1 hour from Friedrichshafen and has a fantastic view of the Bodensee. Erich is a well known EME operator in Europe having operated on most bands up to and including 5.7 GHz. Erich's latest project is the construction of a 12 metre dish to replace his solid 3.7 metre dish. The engineering and precision of the dish assembly is breath taking, the framework has been completed and is now ready for its "skin". The centre 6 metres will be made solid with +/- 1mm



Photo 4: Erich OE9ERC's new 12 metre Dish under construction.

accuracy using a special jig to shape each petal so it can be used on 10 GHz. The balance of the dish will be covered in 5mm aperture mesh.

The wind area of the dish is substantial and as the 800 metre high location is exposed to the West the dish mount and support has required special design. Visible in the photo is the pole mount, a 900mm diameter lower section of a mountain Ski-Lift support mast! The mast has over 100 tonne of concrete as the foundation, Erich doesn't expect to have any trouble with movement!

Erich also is active on 76 and 122 GHz so we arranged a test on the following Sunday with Wolfgang OE4WOG to work from Austria back to Germany to a location just east of Friedrichshafen. Wolfgang had his new "miniature" 122 GHz transverter (see photo) that utilises a new set of PCB's designed by Hans OE2JOM for all IF and DC control functions. Details are to be published in Dubus shortly.

On the Saturday night we had the usual "Microwave dinner" at Tiffany's restaurant. David VK5KK and Peter VK5APR attended along with Sam G4DDK, Kent Britain WA5VJB and the Austrian crew. Hans OE2JOM and Wolfgang OE8WOZ entertained the table with their latest projects.

VK5KK's activity in EU this trip was restricted to 1.2 and 10 GHz equipment only operating from Italy and Germany. This was a self imposed weight limit to give capacity to bring back some items of "significance". As always some extra bargains tipped the scales over so I ended up sending back 2 kilograms of clothing back via DHL surface mail. The 17 Euro expenditure was far cheaper than paying 45 Euro per kilogram for excess baggage!

And in breaking news, Wolfgang OE4WOG and Hans OE2JOM will be visiting Australia for 3 weeks in November 2019. They will be bringing along their 76 and 122 GHz



Photo 5: Wolfgang OE4WOG's new miniature 122 GHz transverter.

equipment. In the next column I will have full details of the "Austrian's in Australia" trip that will include operating in the Spring VHF/UHF Field day!

### VK Microwave Operators Directory

The latest version of Iain VK5ZD's microwave operator survey is included in this column. It lists VK1 to VK7 stations that either responded or were seen to be active in the past 12 months from information gathered from other sources. The information includes a home grid locator as well as the various bands the station is potentially capable of operating on.

If you aren't on the list or have information updates please email Iain VK5ZD at [iain@vk5zd.com](mailto:iain@vk5zd.com). It would be good to include any information on ZL operators as well as this will be most useful during summer DX! The updated version of the list can be found online here <http://www.vk5microwave.net/VKMicrowaveOperators.pdf>

### IC-9700 update

In the last column I gave a "first pass" analysis of the IC-9700 focussing on the transceivers stability and the impact on digital weak signal modes. As that issue went to press there had been further developments on external locking of the 49.152 MHz reference oscillator



## VK Microwave Operators

Call Sign	Operator	Location	1.3G	2.4G	3.4G	5.7G	10G	24G	47G	76G	122G	Indirect Data
VK1AT	Jim Henderson	QF44MS	X	X								X
VK1JA	Jayson Mell	QF44ND	X	X								X
VK1KW	Robert Gulick	QF44MT	X	X								X
VK2AAK	Andy Kier	QF67FW	X	X								
VK2AZ	Hilary Bridel	QF56IF31	X	X								
VK2CU	Justin Lavery	QF46QU14	X	X	X	X	X	X	X	X	X	
VK2DAG	Matt Hetherington	QF56OP	X	X	X	X	X	X	X	X	X	X
VK2JDS	Dave Scott	QF46PU89	X	X	X	X	X	X	X			
VK2JYP	Gary Beech	QF56QO	X	X	X		X					
VK2KAX	Tim Tuck	QF56IF23	X	X								
VK2YAC	Alfred Edwards	QF56JF41	X		X							
VK2YOC	John Edwards	QF56UD0	X	X								X
VK2ZRH	Roger Harrison	QF56MF	X		X		X					
VK3ALB	Lou Blasco	QF21GT86	X	X	X	X	X					
VK3APW	Peter Westgarth	QF21OS13	X	X	X	X	X	X	X	X		
VK3AV	Bernard Petherbridge	QF22PL	X	X	X	X	X					
VK3AXH	Ian McDonald	QF12W1	X	X	X							X
VK3BCU	Nell Muscat	QF22IG	X	X								
VK3BQJ	Rod Graham	QF32WE	X	X	X	X	X					
VK3CG	Gerard Sexton	QF22OF	X	X								X
VK3CV	Andrew Anderson	QF22MAA16	X				X				X	
VK3HY	Gavin Brain	QF22RC	X	X	X	X	X					
VK3JTM	Tim Morgan	QF12LR	X	X		X	X					
VK3KQ	Damian Ayers	QF22PD69	X	X	X	X	X	X				X
VK3RRD	Robert Dickson	QF22KH	X	X								X
VK3LN	Karl Harbeck	QF22IN									X	X
VK3MQ	Rob Whitmore	QF22QE	X	X	X	X	X					
VK3MY	Ross Keogh	QF22PD63	X	X	X	X	X	X				X
VK3ND	Greg Smith	QF22PC44	X									X
VK3NX	Charlie Kahwegi	QF21CT	X	X	X	X	X	X	X			X
VK3PP	Matt Gebert	QF02XF09	X	X	X							
VK3PY	Chas Gnaccarini	QF21CU	X	X	X	X	X					
VK3QJ	Peter Forbes	QF22MD95	X	X	X	X	X	X	X			
VK3QM	David Learmonth	QF21EX92	X	X	X	X	X	X	X			
VK3WRE	Ralph Edgar	QF31GT	X	X	X	X	X	X				
VK3XPD	Alan Devlin	QF22ND16	X	X	X	X	X	X	X	X	X	X
VK3YW	Steven Mathias	QF22PD	X	X								X
VK3ZSJ	Simon Judge	QF21QT	X	X			X					
VK4ADC	Doug Hunter	QG62UG51	X	X	X	X	X					

Wednesday, 22 May 2019

"Indirect Data" indicates the information was obtained from a source other than the operator e.g. 3rd party knowledge, published contact details, etc.

Photo 6: VK Microwave Operators May 2019 Page 1.

to an external however as tests had not been completed I left a bit of a teaser.

Glen VK1XX and Mark VK5EME (Minikits) have both been working on external PLL systems to "override" the internal 49.152 MHz reference oscillator. Initial experiments focussed on locking the internal oscillator by directly controlling the oscillator Vtune pin however the practicality of soldering into an area of 0403 SMD components is not for the faint hearted! Mark found early on that by injecting in a few mW of 49.152 MHz via a small inductor near the output of the 49.152 MHz oscillator that the signal simply overrides the existing oscillator and the subsequent stages then use this signal as the reference. The end result is a simple solution with no actual soldering or modification required of the IC-9700 that would void warranty! Both Glen and Mark are in the process of finalising kits, for more details just Google either call sign and "IC-9700".

In the intervening period, Icom have also released V1.11 firmware that has introduced a digital version of active locking from an external reference. The system does improve the stability of the transceiver to within a few Hz provided the environment is temperature stable. This is probably good enough for more than 95% of digital modes. If you want to see how the systems works I have uploaded a video onto YouTube at <https://www.youtube.com/watch?v=Uz3cCiva3Oo> There are plenty of other videos now online showing most of the other functions. All praise for Icom for responding to early user reports to provide a very workable solution for the IC-9700.

## New VK VHF/UHF Logger - VKSpotter

Last column I reported the retirement of the "VKLogger" chat pages and the temporary migration of VK reporting to the ON4KST logger. Not long after that the new VKSpotter was put on test by Tim VK2XAX as the replacement for VKLogger. VKSpotter is now live at <https://vkspotter.com/> with some new features. The new logger has an up to date look (better than ON4KST!) and is being constantly updated to add functionality. Well done Tim!

## In closing

Feel free to drop me a line if you have something to report especially on VHF as we currently do not have a "VHF Editor"! It doesn't talk much to put a few lines together and helps spread the load. Just email me at [david@vk5kk.com](mailto:david@vk5kk.com)

73's

David VK5KK

Call Sign	Operator	Location	1.3G	2.4G	3.4G	5.7G	10G	24G	47G	76G	122G	Indirect Data
VK4CZ	Scott Watson	QG62LP	X	X	X		X					
VK4EA	Peter Schrader	QG62MO					X	X	X			
VK4GU	Gary Urquhart	QG62M7	X	X	X		X	X				X
VK4HBO	James Kop	QG62MG94	X	X		X						X
VK4HD	Rob Garland	QG63JF	X	X	X	X	X					
VK4OE	Doug Friend	QG62ML38	X	X	X	X	X	X	X	X		
VK4UH	Kavin Johnston	QG62KP	X	X		X	X					X
VK5APN	Wayne Pearson	PF95HG	X		X	X	X	X	X			
VK5DK	Colin Hutchesson	QF02IE	X	X	X	X	X	X				
VK5KK	Dave Minchin	PF95HB	X	X	X	X	X	X	X	X	X	
VK5NE	Paul Roehrs	PF95H75	X	X								
VK5NO	John Ross	PF95HF54	X		X							
VK5OI	John Power	PF94GV	X		X	X	X	X				
VK5OQ	Keith Gooley	PF95JH	X	X	X	X	X	X				X
VK5TE	Simon Brandenburg	PF94GQ	X	X	X	X	X	X	X			X
VK5ZD	Iain Crawford	PF95IH	X	X	X	X	X	X	X	X	X	
VK5ZT	Tim Dixon	PF95IG	X	X	X	X	X	X				
VK7HM	Hayden Honeywood	QE37LD	X	X	X							
VK7MO	Rex Moncur	QE37PC	X				X	X				
VK7PD	Peter Dowde	QE38NN	X		X		X					

Photo 7: VK Microwave Operators May 2019 Page 2.

## Meteor Scatter Report

Dr Kevin Johnston VK4UH

This month: - Use of SH and SWL modes in MSK144, VK-Spotter, Forthcoming Events and Meteor Showers, MS Activity session information.

### MSK144 mode "Masterclass".

Since its release in 2018, MSK144 has rapidly become the de-facto standard mode for Meteor Scatter operation all around the world. Replacing FSK441, the new FEC mode has allowed unprecedented performance in terms of reliable decoding of meteor pings even where MS conditions are poor with meteor returns being brief, weak and/or infrequent. Those operators who have updated from FSK441 will recall that pings much shorter than 100 ms resulted in partial or corrupted decodes or nothing at all. There was however a sub-mode available in FSK441 called "ST" (Short-Text or Single-Tone) where reports from the later stages of a contact (R26 R27 RRR and 73) were represented by transmitting a single tone in place of the normal FSK encoding. The shortest of meteor pings, as conditions were fading, allowed both the software decoder and indeed the unaided ear to identify these reports. These single tones, of course, contained no data at all except by virtue of their frequency. This meant that initial exchange of callsigns had to occur before ST could be engaged. Further, since the transmissions contained no information as to the source or the intended destination, this mode could only be used by arrangement between a single pair of stations already in QSO. Other stations sharing the frequency could not identify either source or intended recipient. Experienced operators however used ST to complete QSOs which would otherwise have been lost.

A similar facility is available in MSK144 mode. Called "SH", this

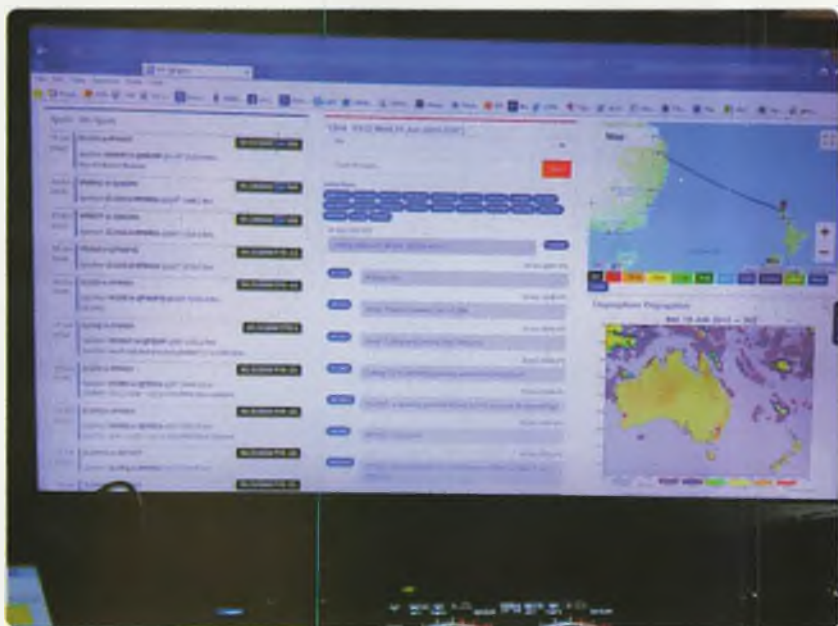


Photo 1: VKSpotter screen.

sub-mode is selectable on the user interface of both MSHV and WSJTx platforms by ticking the appropriate box. Again, only usable after the initial exchange of callsigns is complete, rather than using single tones the SH sub-mode in MSK144 compresses both source and destination callsigns and the later reports into a short-string format. The short string, which still relies on digital FEC encoding, has quite distinct audio characteristics from normal MSK441 and can be decoded on even shorter meteor pings. The downside is, however, that the shortened SH strings can only be decoded by the paired stations involved. The SH strings cannot be decoded or identified by anyone else. Unlike FSK441 ST mode, since the source and destination data is encoded in the string, then more than one pair of stations can use SH mode in MSK144 on the same frequency at the same time. This is a significant improvement.

For any experienced MS operator, the single most frustrating event is to receive a loud ping or

burn, that was clearly seen on the waterfall or even heard in the speaker but that cannot be decoded. This of course is what would happen during SH mode – for everyone except the paired stations in contact. The normal MSK144 decoder will not recognise SH pings. There is a partial remedy for this using the "SWL" sub-mode. Full details of the intricacies of both SH and SWL sub-modes are hard to find but I assume this term implies "Listener" mode. When SWL is selected, both MSHV and WSJTx attempt to decode both normal and SH strings. Where the software has prior knowledge of one or both of the compressed callsigns then a third-part listener can see a full decode of both source and destination stations and the report being sent. Where there is no prior knowledge of the compressed callsigns, at the very least a decode may be given showing <unknown> and the encoded report. This has to be better than just a blank screen.

There are however some traps for new players using these sub-



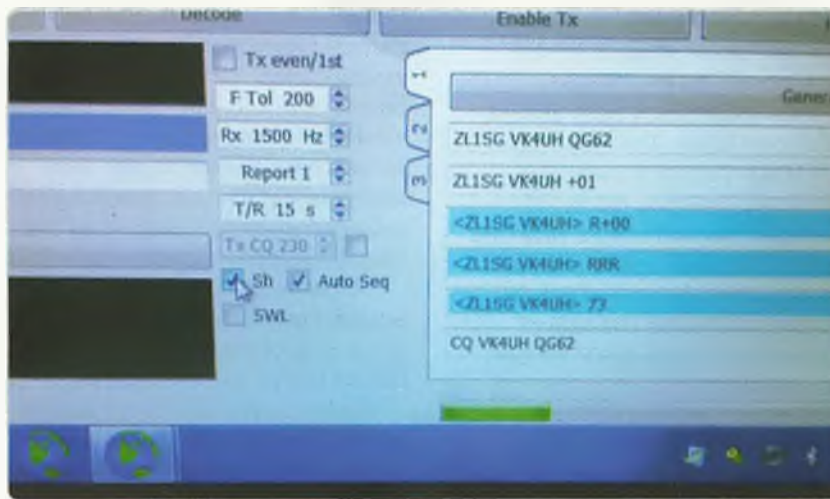


Photo 2: WSJTx SH activation box.

modes. Firstly, if SH is left selected all the time then the software will automatically start sending the compressed format as soon as the initial report and callsign is received i.e. at the R-report stage. If the other station in the pair has not also selected SH or SWL mode then that station will not decode the reply intended for them – the QSO will stall. SH mode can only therefore be used if both stations have already agreed to do this. Currently most stations do not engage SH routinely so there will be a lot of pings wasted. Coordination on the Spotter (see below) can make this possible.

Secondly, it is not possible to select both SH and SWL sub-modes simultaneously. It is unclear why this is the case. In some regards it would be an advantage to be able to do this. Left in SWL sub-mode, a receiving station would be able to decode normal MSK441 and SH strings, intended for himself and for others but would continue to transmit all subsequent reports in normal MSK441 format. This therefore requires manual selection between SWL and SH modes at the appropriate step in each QSO to take full advantage of this option.

As a trial, the current practice of the author, during the 2 m MS during the activity sessions is to select SWL mode routinely. It defaults to

OFF so this has to be done each session. It is then possible to decode SH pings intended for me and any other third-part SH strings, thus causes me less frustration. If conditions are poor or when I receive an SH ping intended for me or with stations I know will follow, I then routinely select SH mode once the initial report is decoded. It requires manual reselection of SWL mode of course as soon as the QSO is complete. By consensus this may be a useful operating protocol to follow. In general, I have not used SH or SWL modes for 6 m MS operation where the meteor pings are typically of much longer duration anyway. There is however no intrinsic reason as to why it could not be used.

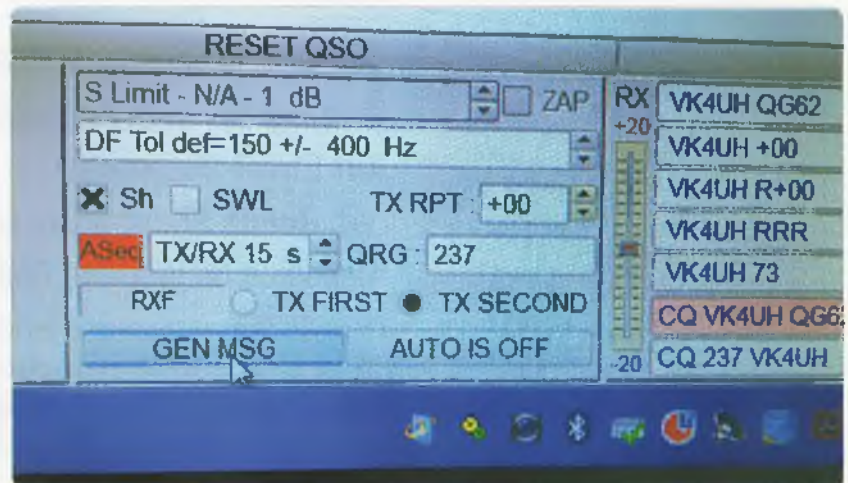


Photo 3: MSHV SH activation box.

## New VK-Spotter

Over recent months the demise of the VK-Logger facility was both mourned and lamented. The Logger had reached end-of-life and despite multiple patches, over several years, was lost to the VHF community. It was recognised that a replacement would require a complete ground-up re-write to be stable and functional across many of the new security requirements of the Web-Hosting Service Providers. This proved to be a much larger task than most of us realised. I am delighted to advise here that the VK-ZL VHF community again has access to a universal reporting facility suitable for all modes and types of VHF activity and for all bands 6 m up through our microwave allocations. This new service, aptly named "VK-Spotter" is the product of development work by Hilary VK2AZ in Sydney. After a successful period of beta-testing the service can be accessed by all amateurs by first registering at <https://vkspotter.com> The Spotter has many features in common with the "Old Logger" which are easy to navigate for the first-time user. The Spotter is still under development with new facilities to follow. Activity reporting and a user-friendly Chat facility is separated for 6 m activity and for 2 m & above. Reported paths are shown graphically on a regional map, colour coded by the frequency in use rather than the

mode and interval since reporting, as was the case with the Logger. Spot are entered by accessing the "Add Spot" pull-across tab on the right-hand side of the screen. Tropospheric Propagation prediction is provided now based on F5LEN predictions rather than the Hepburn charts. Pull-down tabs give access to the callsigns and information for other on-line users and also beacon and repeater listings. Bearing in mind that the facility is very new and still under development a further tab allows registered users to send feedback to the developers for bug reporting and for a wish list for new features or improvements. I would encourage all MS operators to register with the service and spot all completed contacts during the weekend activity sessions. Please take the time to enter your station location details with as much accuracy as possible, preferably with your lat/long coordinates in decimal format, to allow the spotter to provide accurate bearing information for antenna orientation. My thanks go to Hilary VK2AZ for his effort on our behalf.

### Meteor Showers

The next major showers on the calendar will be the Perseids Shower expected to peak around 13 August 2019. The Perseids is a Major Class 1 shower. The Predicted ZHR may reach 100 meteors/hour and occurs when the orbit of the earth around the sun takes us through trails of debris remaining after the passage of Comet Swift-Tuttle 109/P through our solar system.

### Activity Sessions

The weekend activity sessions run on Saturday and Sunday mornings from before dawn (around 20:00 UTC or earlier) until propagation fails.

**Frequencies:** - 2 m 144.230 MHz, 6 m 50.230 MHz Current Preferred Mode MSK144 Version 2.0 15 second periods.

Southerly stations run 1<sup>st</sup> period beaming North, Northerly stations running 2<sup>nd</sup> period beaming South.

Stations in the middle call areas VK2 and VK1 change period depending on the day. Saturday 2<sup>nd</sup>

Periods beaming South, Sundays 1<sup>st</sup> Periods beaming north. Please stay in your correct transmission period, on both 2 m and 6 m, during the weekend activity sessions. Crossed periods cause havoc to both local and distant stations all operating on a single frequency – even when that frequency appears quiet.

Register with VK-ZL Meteor Scatter Facebook Page (Closed group of AR operators) for up to the minute advice and information.

Contributions for this column are as always welcome. Please e-mail to [vk4uh@wia.or.au](mailto:vk4uh@wia.or.au)

Kevin (KJ) VK4UH

### References

VK Spotter: <https://vkspotter.com>

MSK144 Version 2.0 software upgrades can be downloaded from:-

**WSJTx** <https://physics.princeton.edu/pulsar/k1jt/wsjsx.html>

**MSHV** [2hv.org/mshv](http://2hv.org/mshv) or google **WSJTx** or **MSHV** for the websites.



## Hamfest/Comms day Sunday 8 September

Shepparton and District Amateur Radio Club (SADARC)



SADARC is holding its famous annual Hamfest/Comms day at St Augustine's Hall, Orr Street Shepparton.

**Vic Roads Shepparton map 673 Ref P8**

Call in on Mt Wombat Repeater 146.650 MHz.

This is our usual venue. The doors open for traders at 8:00 am and 10:00 am for the public.

We are retaining our very reasonable \$5 entry fee and entry tickets can be purchased before 10:00 am.

There will be quality food at good prices on site, with seating so you can both eat and talk in comfort. There will be a raffle and door prizes for lucky participants. The usual commercial vendors will be there plus many other tables of pre-loved equipment, with around 30 tables in total.





# ALARA

Jenny Wardrop VK3WQ

## New ALARA Committee for 2019 – 2020

*President*

*Vice President*

*Treasurer/Souvenirs*

*Secretary/Min. secretary*

*Editor*

*Historian/Library & Publicity Officer*

*Award Custodian*

*(Assistant Treasurer)*

*Contest Manager*

VK1/2

VK3

VK4

VK5/8

VK6

VK7

Linda Luther VK7QP

Shirley Tregellas VK5YL

Christina (Tina) Clogg VK5TMC

Jean Kopp VK5TSX

Kaye Wright VK3FKDW

Jennifer Wardrop VK3WQ

Marilyn Syme VK5DMS

*Sponsorship Secretary*

Catherine Hammond VK7GH

Marilyn Syme VK5DMS

**State Reps:**

Dorothy Bishop VK2db

Jean Fisher VK3VIP

Lyn Battle VK4SWE

Jean Kopp VK5TSX

Bev Hebiton VK6DE

Linda Luther VK7QP



Photo 1: New ALARA President  
Linda VK7QP

### 39th ALARA Contest

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

**Object:** Participation: YLs work everyone, OMs work YLs only.

**Contest:** Combined phone and CW runs over 24 hours:

**Starts:** Saturday 24th August 2019 at 0600 hours UTC

**Ends:** Sunday 25th August 2019 at 0559 hours UTC

**Suggested Frequencies:** All HF Bands except 160m & WARC Bands.

**Contacts made on Echolink will also be accepted.**

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

NB: If YL is operating as a 2nd operator, her husband/partner CANNOT participate in the contest. Every individual phone or CW contact may be counted.

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

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

#### Procedure:

Phone: call "CQ ALARA CONTEST"

CW: YLs call "CQ TEST ALARA"

OMs call "CQ YL"

#### EXCHANGES:

**ALARA member:** RS or RST, serial no. starting at 001, ALARA member, name.

**YL non-member, OM:** RS or RST, serial no. starting at 001, name and whether YL or OM.

**OMs work YLs only.**

#### SCORING:

**Phone:**

5 points for ALARA member logged

4 points for YL non-member logged

3 points for OM logged

**CW: All contacts made on CW count for double points**

#### OM:

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

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

Please note in mode if contact is on Echolink.

Paper logs or electronic logs are both welcome.

**LOGS MUST** show full name, call sign and address of operator, and show final score (points claimed). **Electronic Logs must be in a format which can be printed by Microsoft Word or Microsoft Excel.**

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

no correspondence will be entered into.

Logs must be received by the Contest Manager by: **30th September, 2019.**

**Contest Manager:** Mrs Marilyn Syme VK5DMS  
14/142 Marian Rd.  
Glynde SA 5070  
AUSTRALIA or: [alaracontest@wia.org.au](mailto:alaracontest@wia.org.au)

**Certificates** will be awarded for the following:

Top score YL overall  
Top score YL phone only  
Top score YL Echolink  
Top score Australian YL CW  
Top score DX YL CW  
Top score DX YL  
Top score ALARA member in each country & VK call area  
Top score OM in each continent & VK call area  
Top score VK YL Foundation Licence holder

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

Top scoring Australian YL  
Top scoring Foundation Licence ALARA member

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

It is with great sadness that I have to report that two of our ALARA members have become Silent Keys.

Celia Reed ZL1ALK was loved by the Amateur Radio fraternity around the world for her gentle nature & friendship. She was a



Photo 2: Celia ZL1ALK, Jenny VK5ANW and Alma ZL1WA at Auckland Airport.

Foundation Member of WARO (Women Amateur Radio Operators) NZ and served 57 years as an active WARO member gaining Honorary Life Membership in 1987, and was President of WARO from 1987-88.

Celia had been an ALARA member since 1981 and attended several of our ALARAMEETS with her husband Geoff ZL1AKY. Geoff passed away in August 2011. Together they had three sons, nine grandchildren, and six great grandchildren.

In 1991 my daughter and I had a 2 hour stop-over in Auckland on the way back to Australia from the U.K. and America. As a WARO NZ member, I had let the ZL ladies know our itinerary, in case there was a chance of meeting up with someone. I had not heard from anyone, so it was a great surprise to hear my name called over the Airport P.A. and to be asked to pick up the nearest phone. When I did it was to be told that two ladies were waiting for us downstairs. The two ladies were Celia and Alma ZL1WA (SK) This was around 7.00am and after having breakfast together, Celia left to go to work (I believe she was a Teacher's Aide) and Alma drove Wendy and me around Auckland for about an hour. I will never forget the kindness of these two lovely ladies. Vale Celia.

Jennifer Wardrop VK3WQ

*My thanks to Marlene ZL1MYL (WARO President), Bev VK6DE and Dot VK2DB for providing much of this information.*

We are also sad to report that Mary Adams VK4PZ passed away on Thursday 29th March 2019. Mary held the well-earned status of Life Member of the Rockhampton and District Amateur Radio Club Inc (RADAR Club) and has been an Amateur Radio Operator and WIA



Photo 3: Mary Adams VK4PZ.

member for 50 or 60 years. Graham VK4BB and Ewan VK4ERM and many others who have been around for a long time would have fond memories of her. Clive VK4ACC, Secretary of RADAR Club remembers going to Mary and Gordon's VK4GM 70th wedding anniversary.

Even in her 90s she was a keen WIA and RADAR Club supporter. She was Treasurer with Hal Hobler, the original VK4DO and then President of the Club, back then it was the Central Queensland branch of WIA (Q).

Mary was well known for raising club funds with her famous Money Board. She became 'Smoko Lady' when her eye sight began to fail. She maintained she could not help technically but could always supply supper at the meetings. That's Mary!

That was her way of helping.

Along with husband Gordon VK4GM they did many JOTA activities. They made a great couple. Gordon could see ok and Mary could hear ok, so combined they could operate effectively. A great couple! Nature's best! Mary's funeral, a private affair, was held in Western QLD at Jericho, with family at her old stamping ground. Vale Mary Adams VK4PZ – Silent Key.

Clive VK4ACC RADAR Club Secretary)

*My thanks to Clive VK4ACC and also to Gavin/VK4ZZ who forwarded it to me.*



## And from Lyn VK4SWE....

One of the most interesting recent contacts has been a 76-year old YL who is on track to become the oldest person to sail solo, non-stop and unassisted around the world. Jeanne Socrates VE0JS has already sailed around the world three times, breaking records as the oldest YL to sail solo and unassisted around the world, plus the only woman to have circumnavigated solo nonstop from North America. She is currently off the SW Australian coast, tracking well offshore but in HF range and is very active on both 20 m and 40 m with regular skeds and keen to chat with Aussie YLs... Jeanne is an interesting conversationalist so why not make the most of this opportunity to learn first-hand what it is like to live full time on a boat battling seas, cooking, navigating, hand-stitching sails and a myriad of other interesting topics. Jeanne's website is <https://svnereida.com/> and she updates her blog regularly. You'll find all the details of her radio sked activity there and some great photos of her trip so far.

Since Lyn wrote the above, Jeanne (she pronounces it Jane) is now off the coast of North Island New Zealand. I was also lucky enough to work Jeanne off the



Photo 4: Jeanne Socrates VE0JS.

North coast of Tasmania on May 9. Somewhere between Tasmania and New Zealand her boat "Nereida" suffered a "knockdown". Jeanne was not badly hurt, but "Nereida" needed a little TLC, and repairs were made in New Zealand. We wish Jeanne a safe and successful completion of her trip. Jen VK3WQ.

## Echolink skeds on the ALARA Conference Station

The Echolink skeds listed below are held on the "ALARA" Conference Station.

In some areas they can be accessed via the IRLP node of 9509.

**YL IRLP net** - 1st and 3rd Saturdays of the month at 2100 UTC and net control is Ann ZL3TNT. (Early Sunday morning for Australia)

**YL Downunder Net** - 4th Thursday of the month at 0500 UTC. Shirley VK5YL is net control.

**ALARA Monday night nets** - The net runs every Monday night with the 1st and 3rd Mondays on Echolink. The third Monday night net is both Echolink and HF.(80 M 3.570 MHz) Times are Winter - 1030 UTC, Summer 1000 UTC.

**YLRL Weekly net** - 0000UTC (During our Winter) every Friday. Net control is usually Catherine AC4YL

**Minows net** - 0230 UTC every Friday. Net control is Margaret AE7MB

## Other Nets

**VK3 Net** - Join Jean VK3VIP at 0800 EST on Tuesday summer evenings on VK3RMM repeater 147.250 (Mt Macedon). Winter evenings 0900 EST.

**Ann Renton Memorial Net (Townsville)** - Runs fourth Tuesday each month, 146.50 MHz at 0930 UTC from TARC (Townsville).

**VE3TTT-R Minnie's Net Echolink conference station is VE3TTT-R (a repeater stations which is linked into Echolink by the guys in Ingersoll, Canada.)**

This station is set up to receive Echolink stations as well as 2 meter check-ins. Minnie VE3DBQ is net control for this sked which happens at 2130 UTC on every second Wednesday, the next one starting on 4th July, 2019 then every other week after that. (Early Thursday morning for Australia).

**Notes:** Please make sure you check your UTC/24 hour clock to get the timing correct. We'd love to have some new YLs check in. These nets are lots of fun. If you, or other YLs you know, would like to run a net on the ALARA Conference Station, from anywhere in the world, please drop me a line via e-mail so I can make sure the station is free at your requested time.

33 Shirley VK5YL  
[vicepresident@alara.org.au](mailto:vicepresident@alara.org.au)

## Participate

<b>Cardwell Gathering</b>	4-7 October
<b>Yarra Valley Amateur Radio Group Hamfest</b>	13 October
<b>BARG Hamvention</b>	27 October
<b>Rosebud RadioFest 2019</b>	17 November



## DX Talk

Luke Steele VK3HJ

e vk3hj@wia.org.au

Mostly quiet HF conditions continued during May and June, with a spotless sun for thirty-five days in a row. This year has seen 62% of the time without sunspots, compared with 61% of all of 2018 without sunspots. This data suggests we are at or close to the sunspot cycle minimum but it will take another year or two of averaged results to know more precisely.

### Around the bands

Low bands activity was somewhat diminished, given that many in the northern hemisphere have given it away due to summer storm static but there has been some choice DX on 80 m around sunrise, including Africa. A few die-hard SSB operators continue to work DX on the 80 m DX window, mostly North and South America in the evenings. On 40, 30 and 20 m, there have been some good openings but also many very quiet days. FT8 has been the mainstay but some CW DX has also been available. SSB activity really suffers at the low part of the solar cycle but the long path to Europe and short path to North America still sees some good DX on 20 m, mid-afternoon. There is still a little bit of activity on 12 and 10 m, mainly Asia and North America on FT8.

### DX Heard or Worked

During May, Nobby G0VJG was active from Fiji as 3D2AS, then Wallis Island as FW5JG, then as 3D2AS again. Harry JD1BMH has been active from Chichijima, Ogasawara. Dindo DU1UD activated Mapun Island OC-105. DXpedition TO19A operated from Reunion Island. There were also some newly

allocated IOTA groups activated, including K7Y Khantaak Island NA-250 (Alaska), R26RRC Paramushir Island AS-204 and R205NEW Bogoslova Island AS-205, both off the Kamchatka Peninsula in the Russian Far East. Eddy XV1X has been active in Vietnam. Ghana's Ho Technical University Club Station 9G2HO has been very active. DXpeditions E31A Eritrea, S9A Sao Tome and 3D2CR Conway Reef gave us some opportunities for fairly rare DX. Laci S79HA was active from Seychelles in late May and Karnil S79KW continues operation as a resident there. Back to our side of the world, Nob T88PB was active from Palau and Take JG8NQJ/JD1 is working again on Marcus Island, Minami Torishima.

### Upcoming DX

DXpedition activity scheduled for July and August includes:

**H44MS Solomon Islands, 7 July – 20 September.** Bernhard DL2GAC will be returning to Malaita (OC-047). Michael DL2GMI will be joining Bernhard 23 August to 2 September, callsign TBA. They expect to be operating 80, 40, 20, 15 and 10 m, and possibly 6 m, in SSB, FT8 and RTTY. QSL DL2GMI via DARC Bureau, direct or LotW. QSL H44MS via DARC Bureau or direct.

**E44WE Palestine, 6 July – 3 August.** Janusz SP9FIH returns to Palestine for the fourth time, to operate as E44WE. He plans 80, 30, 20 and 6 m operation, using FT8, RTTY and SSB. QSL via ClubLog OQRS or SP9FIH direct. For more information see: <http://www.e4.dxpeditons.org/>

**9M6NA East Malaysia, 7 – 16 July.** JE1JKL will be operating from Labuan Island (OC-133) He will be active in the IARU HF Championship, and will focus on 6 m FT8 before and after the contest. QSL via LotW or Club Log.

**P44W Aruba, 11 – 16 July.** John W2GD will be active in the IARU HF Championship, 160 – 10 m, mainly CW. QSL via LotW or via N2MM.

**V47JA St Kitts, 20 July – 11 August.** John W5JON will be operating from his Calypso Bay station 160 – 6 m, in SSB and FT8. QSL via LotW or W5JON direct.

**FO/A15P French Polynesia, 22 – 29 July.** Rick A15P will be operating holiday style 40 – 17 m, in CW and FT8. QSL via A15P direct or bureau.

**RSGB IOTA Contest, 27 – 28 July.** For a list of announced IOTA Contest Operations, see: <https://www.ng3k.com/misc/iota2019.html>

**8Q7SU Maldives, 31 July – 7 August.** Sugi JI3KDH will be operating from Kuda Bandos Island (AS-013), 20 – 10 m, in CW. QSL via LotW and eQSL.

**CY9C St Paul, 31 July – 8 August.** Seven of the 2016 DXpedition Team will be returning to St Paul Island. They will be operating 160 – 6 m, CW, SSB and FT8. QSL via Club Log, or via WA4DAN. For more information see: <http://cy9c.com>

**HC2/IZ1HGP Ecuador, 1 August – 1 September.** Joe IZ1HGP will be operating from Isidro Ayora Finca, Guayas, on 160 – 6 m. QSL via LotW.

**VK9APX Lord Howe Island, 1 – 10 August.** Rick A15P will be operating holiday style from OC-004 on 40 – 17 m, in CW and FT8. QSL via A15P direct or bureau.



OH0UDG **Aland Island**, 3 – 17 August. DK3BK, DO5JD and DK3CKM will be operating 80 – 6 m, in CW, SSB and digital. QSL via LotW or M0OXO.

5R8PX **Madagascar**, 3 – 17 August. Giovanni will be operating from Nosy Be (AF-057) on HF, using SSB and digital. QSL via LotW or IK2DUW bureau or direct.

T05M **St Pierre & Miquelon**, 10 – 18 August. Alex DD5ZZ, Chris VO1DX, Martin DM4IM and Georg DJ6GI will be operating from Île aux Marins (NA-032) 160 – 6 m, in CW, SSB and FT8. QSL via LotW. For more information see: <http://fp2019.net/>

9U3TMM **Burundi**, 31 August – 17 September. Francesco IV3TMM will be operating from Bujumbura on 60 – 6 m, using FT8, SSB and RTTY. QSL via LotW.

### Rebel DX Group news

The latest news from the Rebel DX Group is that it plan to activate several Pacific Islands until October and in November head back to Bouvet Island. After the most welcome surprise of 3D2CR Conway Reef activation, next on the agenda is T33T Banaba Island, sometime in July.

For more information visit the group's website: <https://www.rebeldxgroup.com>

### T30GC Western Kiribati DXpedition

Stan LZ1GC, Karel OK2WM and Mitko LZ3NY plan activity from Tarawa Atoll (OC-017) from 7 – 23 October. They will be operating 160 – 10 m in CW, SSB and RTTY and plan to work around the clock, with three stations available. Anyone who has heard Stan's regular DXpeditions to the Pacific area will know he is a QSO machine. This should be fairly easy to work from VK.

For more information visit their website: <http://lc21gc.com/>

Please email me with any DX related news for inclusion in this column. I am particularly interested in hearing about DX worked or heard in other states, and from newer DXers.

73 and good DX,  
Luke VK3HJ



<http://ncrg.info/WP/>

## NCRG HAMFEST WA

**August 25, 2019**

Cyril Jackson Community Hall, Fisher Street, Ashfield WA

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# SOTA and Parks

Allen Harvie VK3ARH

e vk3arh@wia.org.au

Hi all,

It has been a busy couple of months. Winter has not slowed down the activations with around 380 activations over the last six weeks comprising 250 unique WWFF and over 100 SOTA.

Highlights include Ian VK5CZ activating 11 summits on the way to goat-hood and VK4AAC picking up the final four parks to qualify for the KRMNPA Grand Slam award. Read the reports from Ian and Rob below.

VK5PAS qualified for WWFF VKFF Activator Honour Roll with over 300 activations. Gerard VK2IO hot on his tail, qualified for VKFF Activator Honour Roll 200. Gerard didn't stop there, activating over 50 parks (activating as I type this) and several SOTA Summits on a tour of VK3 and VK5.

The combination of activators out of their home states and (as always) erratic bands made for interesting moments when a callsign was workable when it shouldn't be, and periods of silence from expected sites that should have been active. VK3PF added 26 to his tally taking in sites on the return from the AGM. Greg VK4VXX has been keeping VK6 active as he started the trip back towards home, with VK5 and VK2 parks activated. Mike VK6MB is touring VK3 and activated 38 separate sites. Linda VK7QP was also touring VK2 and VK3 collecting parks. Tasmania was not quiet with Helen VK7FOLK and Jon VK7JON and separately Angela VK7FAMP activating three each.

SOTA summits were not neglected with Andrew VK1AD continuing to get out in the mornings to activate the high bands looking for 1.2 and 2.4 GHz contacts.

The SOTA bonus period is not active across each VK association



Photo 1: Rob operating from his vehicle.

and was in time for the early snow in the alpine. Because of the heavy snow falls in Alpine areas many roads and tracks were closed early but a handful of activations took advantage of the bonus period to activate when Crompton VK2HRX dusted off the Troopie and picked up a nice collection of summits including VK2/CT-003, VK2/CT-005 & VK2/CT-002; Brian VK3BCM, activated VK3/VG-045 and VK3/VG-036 while Andrew VK1DA picked up VK2/ST-006.

SOTA was represented at the WIA AGM with Andrew VK1DA presenting and manning an exhibition, with several SOTA and Parks regulars assisting. The

presentation was well received. Checkout his blog at VK1DA.blog for this and info as to the high band activations.

If your email is quiet, it may be because both SOTA and WWFF groups are now hosted on groups.io.

Ensure you are subscribed to <https://groups.io/g/wwffaustralia/> and <https://groups.io/g/OZSOTA>

So get out there and activate. If you can't then chase not forgetting to spot the activators (Paul VK5PAS has posted a spotting and alerting video with viewing: <https://youtu.be/N9xc6N13n6U>) and enjoy!

Allen VK3ARH



## Keith Roget Memorial National Parks Award

Rob Janoska VK4AAC

My wife and I retired early in 2014 and we decided to hit the road with our caravan and travel Australia. I had not been active on the bands for many years and decided to get back into the hobby. I thought that combining our travel bug with Amateur Radio would be a good idea. Little did I know!

After a chance contact with park activator Paul VK5PAS, in early 2015, I was hooked and started hunting and activating parks. By October 2015 I had logged my first Victorian National Park as a hunter, Hattah-Kulkyne National Park.

At this point I was unaware of the Keith Roget Memorial National Parks Award (KRMNPA).

Between 13 and 15 November 2015, I managed to hunt another 10 Victorian National Parks (NPs). Late 2015 I was made aware of the KRMNPA and although I was not going to actively seek out only NPs in our travels, I hoped that someday I would have them all in my log, both activated and hunted.

By April 2019 I had hunted all 45 NPs, Organ Pipes being the last one.

My first Victorian NP activation was Gunbower in March 2016. By the end of 2016 I had activated 39 of the 45 NPs. So much for not actively seeking out the Victorian NPs...Hi!!

The whole of 2017 saw no more entries in my log for NP activations in Victoria.

Early in 2018 I realized that I required only six more NPs to complete all 45 activated.

June 2018 was my next activation, French Island NP with a lot of help from Peter VK3ZPF.

Approximately 12 months later by June 2019 I had activated all 45 parks with Hattah-Kulkyne being the very last one.

Now, it was not until I was asked to write this summary that I discovered that my very first hunted



Photo 2: Rob's set up at Hattah-Kulkyne National Park.

park and my very last activated park was one and the same - Hattah-Kulkyne NP, how freaky is that!!

It has been a lot of fun hunting the NPs and very enjoyable camping out in a lot of them for the activations.

I would like to thank all the hunters and activators who have made it possible for me to achieve this award.

73

Rob VK4AAC

### My trip to Mountain Goat

Ian VK5CZ

After six and half years I have accumulated 1000 activating points in the SOTA program to make Mountain Goat, the top Award in the program. Starting out in October 2012, I was very keen and excited to take part in this great activity. The first thing to get right in SOTA is access permission from the owner of the Hill or Mountain which is the designated summit; some are in Parks or Forest department lands but most are on private property. As I went around working out these issues I had a couple of unfortunate experiences of not asking the right person for access and was challenged by a land owner who ended up happy with me being on

his property once I explained the mistake. Only four land owners of the 50 summits I have visited have decided maybe it's not a good idea to grant access again for SOTA; the rest of the farmers I deal with are very good and always grant permission but I phone them every time before heading out. Another issue is land ownership can change and I have to ask the new owners for access permission all over again; two such properties have differing circumstances and access is no longer available to me or anyone else. To make Mountain Goat in South Australia, access to low scoring summits is normal because the summits are not really that high in altitude in the general areas within 200 km from my home. Expect to do lots of travelling and lots of hiking as there are not many summits with access roads to the top. As a rough idea in year 2018 I drove to 43 summits with a total of 7,800 km of travel and total hike distance of 160 km with only 10 summits where I could drive to the activation zone. Several summits required accommodation either at Quorn, Orroroo or Bendelby Ranges to save even more travel time and distances. My final activation points average was 3.8 points per activation making

a total of 263 summits visited and roughly 43 summits per year depending on my time available and the seasonal conditions.

The Mountain Goat activation finally became reality on 24/05/2019; I thought it appropriate to make Mt Horrocks the summit to achieve the award. Coincidentally I only needed two more points to qualify, so it was great to be able to visit Mt Horrocks for the special occasion. Starting out at 2309 hours UTC for my first contact with Dale VK5LD and John VK5MJC who called me here on the first ever SOTA activation in VK5 back in October 2012, it was nice to work them again. The next faithful chasers were Adrian VK5FANA then Nev VK5WG who was contact number 4 to qualify the activation



Photo 3: The antenna support lashed to the fence post.

for me. Nev is the highest scoring VK5 Chaser and rarely misses calling me on a SOTA activation. The small group of local chasers

who always make the effort to work me especially now 80 m is the more local band to use really help me qualify most summits before I need to change to 40 m SSB or CW. They are VK5WG, VK5WE, VK5IS, VK5MJC, VK5WY, VK5LD, VK5FANA and on this occasion Hugh VK5NHG went to Tothill Range Summit for an S2S QSO as well. Hugh has helped a lot with finding property owners to gain access to summits for us both and we often activate together on trips away.

Even though the weather was windy and very cold, it was nice to get the rain.

Thanks to all the chasers on 40 m SSB and CW before and after UTC roll over making my day a great success on this special occasion.



Photo 4: The VK5CZ SOTA station on the Mountain Goat summit.



## VK2news

Tim Mills VK2ZTM  
✉ vk2ztm@wia.org.au

### 2019 WIA AGM

The 2019 WIA AGM was held in Sydney last May. This was the first time back in Sydney after the original AGM of the restructured WIA held in 2006 as a one afternoon event in Bankstown. This time, the

three days of activities was a joint operation between the Waverley ARS, ARNSW and the WIA. The Waverley ARS was celebrating its centenary on the Friday evening in the Marconi Room at the Sydney Town Hall. The Saturday was the WIA turn at the Park Royal venue adjacent to Darling Harbour with the AGM and the Forum in the morning

and the range of talks and lectures in the afternoon. The evening was the formal Convention dinner. The Sunday was hosted by ARNSW at their VK2WI Dural site as part of the bi-monthly Trash & Treasure. There was a display from many local clubs and groups like SOTA, Blue Mountains ARC, St. George ARS, ALARA, HADARC, ARNSW Experimenters group, CREST and WICEN. There were tours of the broadcast and site facilities, a catered lunch and two technical



talks before the conference delegates bussed back to the hotel for final farewells.

In June the Waverley ARS held a farewell dinner to their Centenary celebrations followed by their AGM. The Special event call sign has finished. In July they held their annual auction on the only Saturday that the hall at the Rose Bay clubs rooms is not occupied with a ballet class. In August they have a great speaker lined up for the monthly meeting, Kerrie Dougherty - a space historian. It may be held at a different location so keep an ear on VK2WI News for details. They have a Foundation course and assessments scheduled for the 14 th & 15 th September. On the first Sunday of each month a Morse class is held in the club rooms at 11 am.

## ARNSW

The July Foundation and assessments weekend has been held and the next is scheduled for the 14 th & 15 th of September. The cut off for bookings is 5 pm on Friday the 30 th August. Inquiries to [education@arnsw.org.au](mailto:education@arnsw.org.au) The July Trash & Treasure is set down for Sunday the 28 th. Access to Wi-Fi on the Dural site for members has been installed. The pass word is on the notice boards and will change at intervals. A few 2019 call books have been obtained and will be available at the T&T. A reminder that the Sunday morning and evening VK2WI News from Dural and provincial relay stations is also streamed on the internet at [www.arnsw.org.au/audio](http://www.arnsw.org.au/audio) It, along with some lectures and talks held at Dural can be downloaded at any time. This streaming source is available to any club or group who may care to relay VK2WI News in these times of poor HF propagation. Details maybe obtained by an email

to [news@arnsw.org.au](mailto:news@arnsw.org.au) which is the same address for any news input to the weekly sessions. Now for a reminder that the VK2WI Dural site is private property - and Emergency Management Procedure regulations are in place for all on site activities. This requires all members and visitors signing the attendance book whenever they are on site. The change over of Company name has been completed with ASIC and the former division is now known as Amateur Radio New South Wales - ARNSW - and its origin of its registration goes back to May 1922 and further back to the original body - in 1910 - The Wireless Institute of NSW. At the same time of the name change, new Articles were voted in to incorporate the current requirements.

## Oxley Region ARC

The 44 th field day was held this year in the Wauchope Showground Pavilion. It was an ideal venue for the two day event, being large with level access and adjacent parking. A booking has already been made to hold next year's field day there. The field day dinner on Saturday evening was held at the Port Macquarie Golf Club, also booked for next year. The Oxley Region ARC meets on the first Saturday afternoon for the monthly meeting and the third Friday evening for the mid monthly meeting. All are held at the SES building in Central Road, Port Macquarie. Access this year to the Tacking Point Lighthouse is not available due to renovations, so the club station, VK2BOR will operate both the RD and Light House weekend from the car park of the nearby Tacking Point Surf Club.

## Activities

Blue Mountains ARC held a winter fest early July and paid the Kurrajong Radio Museum a visit

mid July. They have scheduled a Foundation and assessment weekend for the 10th and 11th August. [education@bmarc.org](mailto:education@bmarc.org) On Saturday the 29 th July they have an antenna building day. There is electronic training on Thursday evenings. They meet at Moore St, Glenbrook.

The Oz VE group held their recent exams using the recently introduced 2019 - 2023 exam papers on the first of July. This puts them ahead on the release of the papers in the US due to the time difference. Contact details can be found at: <https://veexams.com/contact/> August is the month - 17th & 18th - for both the RD Contest and the Light House weekend and this year both will be on the same weekend. It should be noted that the RD is a fast moving activity to gain maximum contacts and the light house operation - a slow paced activity. All operators should respect the requirements of each group and not harass each other for contacts. WICEN NSW will have a week of the Shazada Horse Enduro at St. Albans from the 25 th to 30 th August. Then Kangaroo Valley Trek for Timor 14 th / 15 th September, and Hounslow Classic Upper Blue Mts 28 th / 29 th September. The Great North Walk Ultra event on the Central Coast has changed to a close circular course with good commercial communications so the ten year involvement by WICEN has come to an end. Westlakes ARC has a car boot sale Saturday 20 th July. HADARC is one club with a recent AGM. There was very little change in the management committee. Their two meetings a month are usually held at Mt. Colah.

73

Tim VK2ZTM / VK2UJ.

Join your local club

Look under Radio Clubs at  
[www.wia.org.au](http://www.wia.org.au)

Interact with local amateurs.

Participate on regular **meetings** and **functions**.

**Training** and further **education** for amateurs, new and experienced.



## VK5news Adelaide Hills Amateur Radio Society

Phil Storr VK5SRP

Work has progressed slowly but surely on making the second shed at the Girl Guides site where our shack is situated, a safe and secure storage for the SA Girl Guides association archives. Like our radio shack on the same site, it started out as an old tin shed inhabited by a lot of rubbish and a lot of spiders, both live and deceased.

We have had a small band of helpers clean it out, a local handy man put in a ceiling, repaired the vandal damage to the walls and we are finishing off blocking up the spider access holes and painting the inside. When the weather gets warmer, we will take off some of the outside cladding and insulate the walls and repaint the outside.

A BIG thankyou to the dedicated few who have done this work since January this year. Many of us are limited in our ability to climb ladders; we have to rely on a few fellows who are more agile than many of us older members.

The site no longer hosts a Girl Guide troupe; they use it as a training facility and storage for their vast collection of archival material. Looking at the "stuff" in the main hall, it looks to me like they will have to employ the people who created Dr Who as it is going to have to be turned into a Tardis.

The site is located in bush land in Blackwood in the Adelaide Hills and has a lot of old trees that shed limbs and lots of leaves all year round. Twice a year our members spend a day or two cleaning up the site as it is a fire risk, especially if the vandals we have trouble with in the past, try to burn the place. We have been spared the worst vandal attacks this year, mostly limited to tagging the building and strewing rubbish from the local fast food outlet around the paddock.

We meet at the shack on the second and fourth Saturday mornings of the month, on the second Saturday for a coffee and chat session and on the fourth Saturday for a technical session.

The First or third Saturday mornings can be used for training and assessments.

You may remember I have spoken about the enormous effort a few of our members put into repairing the tower at our Crafers repeater site. This has been providing good two metre communications over a wide area since the beginning of the year on the VK5RAD repeater, 147.00 MHz with a minus 600 kHz offset. There are plans to further improve this service with a series of repeater linking projects that are progressing slowly.

This year the very successful AHARS Buy and Sell will be at the Marion RSL on Sunday the third of November. The shift to this location has been made because of the parking problems at the location we have used for many years. The facilities and the services the RSL are going to provide for us are lot cheaper also. They did an excellent job on our January Picnic this year. The address is 31-39 Norfolk Rd, Marion, South Australia; more details will be on our web site soon.

## Hamads

### FOR SALE – VIC

Shack clean out.

FT620 6 meter SSB, AM, CW radio ( Serial 4M011304) \$60. FT707 All band HF radio (serial number not legible) \$250. CRO Dick Smith 10 MHz with probe ( Serial 05CM1563) \$40. Two 10 henry 300ma chokes for high voltage power supply. Power Transformer 780V CT 780V, 300 ma. plus 2V CT 2V 6 amp. Power Transformer, 190V 200 ma 6.3V, 6.3V, 50 V, 12V CT 12V. Power transformer A&R Type 1884 250V CT 250V, 80 ma 6.3V 2amp, 6.3V 2 amp CT, 5V 2 amp. Woden UM1 Modulation Transformer. VHF antenna rotator Cornel Dublier AR- 20 L series. \$50.

Trevor VK3PD Frankston 0409 973 301

### FOR SALE – SA

Icom 290a transceiver in excellent condition full 11watts

Mervyn Millar [arvk5mx@gmail.com](mailto:arvk5mx@gmail.com)

### WANTED – QLD

Wanted crank up tower. Lattice design. Preferable self supporting. Contact Will VK4WBX [will.benn@bigpond.com](mailto:will.benn@bigpond.com) or phone 0428 758 837 Sunshine coast Qld



Wade Smith VK1MIC



Photo 1: The Canberra Region ARC portable operation for the one hour sprint.

Winter has well and truly descended on VK1 but that has not slowed AR activities. As I foreshadowed in the last edition, our major repeater site located at Mt Ginini is now fully snow locked, so the pre-winter maintaining undertaken was perfectly timed.

The Canberra Region Amateur Radio Club (CRARC) recently held a fun 1-hour sprint contest on VHF & UHF with logs showing over 19 contacts yielded by some of the top



Photo 2: Chris VK1CT's portable power pack.

performing stations with contacts into central VK2 peppering the logs. The CRARC team is still combing logs to award a certificate for the highest contact earning station by license class.

VK1 continues to have a strong showing in the portable operations across Parks (VKFF) and SOTA:

Bill VK1MCW has recently clocked up over 1000 'chaser' points to earn the SOTA rank of SHACK SLOTH; Bill also semi-recently completed a summit to summit contact with Andrew VK1DA/2UH using 23cm on CW, possibly a first for VK.

The author has dipped his toe into the 1296 MHz realm, after taking delivery of a SG Labs transverter adding to the considerable VK1 SHF crowd.

Chris VK1CT recently showed

off his portable power build which is based on a 7Ah sealed lead acid battery. It can be charged by a solar panel and has an LED display to show voltage and current draw. It also has two USB output ports, which can be used to power anything that normally charges via USB. It has Anderson connectors for both the solar panel input and the 12 v output. A small solar regulator controls battery charging. All components are housed in a plastic ammo box.



Wireless Institute of Australia **2019** Callbook

Available **Now**

Tony Hambling VK3XV  
e [arv@amateurradio.com.au](mailto:arv@amateurradio.com.au)  
w [www.amateurradio.com.au](http://www.amateurradio.com.au)

## ANZAC Day 2019

Members of Amateur Radio Victoria once again participated in ANZAC day activities with a small "active" display and On Air station aboard museum ship HMAS Castlemaine.

HMAS Castlemaine served in World War II and is the last Bathurst Class corvette still afloat. Now berthed at Gem Pier, Williamstown and open to the public on weekends and Public Holidays the "Castlemaine" is a very popular Melbourne tourist destination.

Joe VK3YSP set up a "hands on" straight key CW Oscillator in the ships Bridge area and was kept busy throughout the day demonstrating and explaining Morse Code and the vital part it played during Castlemaine's active service.

Many AR promotional brochures were distributed by Julie VK3FOWL, while other members assisted with the general public's questions regarding all aspects of our hobby. Automated AR Satellite Tracking gear which was displayed on deck. Thanks to all participants and the ships volunteers for their support and assistance in promoting AR and the "Castlemaine".

## VK3 Operating Awards

May and June have been busy months with Three Keith Roget Memorial National Parks Awards (KRMNPA) being issued.

The KRMNPA is available to those who Activate or Work (or both!) the VK3 National Parks.

Two Grand Slam Awards have been claimed and awarded. The Grand Slam is having Activated and Worked all 45 VK3 National Parks.

This is a major achievement taking much dedication and perseverance in gaining the prestigious award.

The latest Grand Slams go to Peter VK3TKK and Rob VK4AAC/3.



Setting up on HMAS Castlemaine for ANZAC day activation and Amateur Radio Exhibition. Photo by Julie VK3FOWL.

Brett VK2VW has worked all 45 VK3 National Parks and has successfully claimed the KRMNPA MERIT Award.

Great effort and well done! Further details on KRMNPA activities can be found in the SOTA & Parks pages of AR magazine.

Full KRMNPA rules and information can be found on the ARV website [www.amateurradio.com.au](http://www.amateurradio.com.au)

## 2019 Diary Dates

### ARV Homebrew Group

#### 2019 meeting dates

3rd August, 7th September, 5th October, 2nd November and 7th December.

Meetings are held at ARV, 40g Victory Blvd. Ashburton 3147. Commencing at 2pm. All welcome!  
Contact Rob: [vk3mq@amateurradio.com.au](mailto:vk3mq@amateurradio.com.au)

## International Lighthouse and Lightship Weekend 2019

VK3WI will be active from the Williamstown Time Ball Tower once again for the 2019 ILLW Weekend

and for the 2019 Remembrance Day Contest.

Both these events are being held on the same weekend in 2019 - August 17 & 18. VK3WI will be submitting an RD Contest Log.

## KRMNPA activation period 2019

The popular annual Keith Roget Memorial National Parks activation period will take place across 4 days in 2019. Friday November 8-Monday November 11.

This is the ideal method of increasing your VK3 National Parks tally for this prestigious Award. VK3WI will get the ball rolling with an activation of the Brisbane Ranges National Park on Friday November 8.

All members are encouraged to participate in these outdoor events. Please contact Tony: [vk3xv@amateurradio.com.au](mailto:vk3xv@amateurradio.com.au) for further information.

Don't forget to visit the ARV Website: [www.amateurradio.com.au](http://www.amateurradio.com.au)



Steve Kennedy VK6SJ

Firstly, apologies to all clubs in VK6. I completely missed my calendar reminder to solicit news items so the only news being provided here is for NCRG (which I write) and an interesting article on an EME operation in Perth.

## Potential EME Record set on 5.7GHz

A number of NCRG members have been working on both their own and a club EME station, with one member (Dean Last – VK6DSL), being a professional satellite earth station specialist. As part of his work in this field he was preparing a 27 m 6 GHz dish for a new contract for his employer. To set up the station, he decided to use the amateur 5.7 GHz band and with some additional moon tracking software, built a system comprising of an FT290R 2 m SSB radio, feeding a Khune Transverter, fed into a TWT Amplifier providing exactly 398W PEP at 5.7 GHz into the dish, with an overall antenna system gain of around 61 dB. This was then used to communicate with 2 big gun EME stations in Europe (HB9Q and OK1KIR) with 5-9 +++ reports all round. All contacts were on SSB and we believe these are the 1<sup>st</sup> SSB voice contacts made from Australia to Europe (and possibly anywhere outside Australia) on 5.7 GHz.

Accompanying him were two other club members and keen EME practitioners, Keith VK6EME and Larry VK6UM.

## Northern Corridor Radio Group

NCRG has had a relatively quiet 2 months with a number of the more active members attending the Ham Radio Friedrichshafen. A great time was had by all with even a few beers being consumed.



Photo 1: Dish used for the 5.7GHz EME contacts.

NCRG recently held its AGM with the following office bearers voted in:

*President* – Tim VK6EI  
*Vice President* – Eddie VK6YA  
*Secretary* – Chris VK6LOL  
*Treasurer* – Anthony VK6AL  
*Committee members* – Steve Kennedy VK6SJ and Ian VK6TJW

A special mention was made to outgoing treasurer James VK6FJA who has done a magnificent job of the role for many years. His contribution was greatly appreciated.

The club participated in the CQ-WPX contest in late March with a submitted raw score of 2,168,748 points to be placed 3<sup>rd</sup> in Oceania (and 1<sup>st</sup> for VK), for Multi Op single

TX and overall 6<sup>th</sup> in Oceania (2<sup>nd</sup> in VK behind VK4KW). A good time was had by all, and we are making plans for the RD and CQWW.

Planning for this year's Hamfest is well and truly in progress. This year the ever-popular raffle will have an IC-7300 as first prize, an IC-2300 as second prize and a \$100 Voucher for TET Emtron as third prize. NCRG would like to thank Icom, RF Solutions and TET Emtron for their support for these prizes. In addition to the raffle this year, we are giving the Homebrew contest a birthday, increasing the categories from 1 to 3; with categories for rookies (those licensed for less than 3 years) and one for under 18 years old. Prizes will include a radio and vouchers for DX Radio Systems. We are also

planning a fox hunt aimed at getting youth involved in Hamfest. We are encouraging hams to bring their kids/grandkids to Hamfest and try out foxhunting and see what our great hobby is about. Hamfest will be held at the Cyril Jackson Community Hall, Fisher Street, Ashfield on the 25<sup>th</sup> August, starting at 0900 sharp, with table holders entering at 0700.

### Christmas Island Amateur Radio Club

Welcome everyone.

It has taken a little effort to get into the Christmas Island swing again but getting there. We have commenced weekly club operations every Thursday at 0900UTC on 14140 and again at 0930UTC on 7140.

We are adding interest with other EMR projects to the club's operation and will be submitting request for use or lease of land and accommodation on top of the island near the airport! I have written to the new licensing appointee, the Australian Maritime College (AMC), part of the University of Tasmania (UTAS) to the contact provided, Martin, as appointed by the Australian Communications Media Authority (ACMA). As yet the CIARC has not heard from Martin, AMC, UTAS or the WIA in the last few weeks about what are we going to do for examinations and licenses?

To promote Amateur Radio for the kids on Christmas Island, we have applied for free copies of the foundation license manuals from WIA, which has been approved and are being shipped. As mentioned in the WIA broadcast in March,



Photo 2: Christmas Island.

the manuals are made available to encourage students and get some young blood into the hobby.

There have been several contacts every Thursday for the last couple of weeks so the bands appear to be getting back to southern winter mode opening.

We are currently looking into additional activity from or assisting non-profit High Frequency travellers net run by Kim VK6TQ. The VMD traveller's network or "What Is Out-n-About", is an app suitable for Android and

Apple mobile phones and tablets; specifically designed and engineered for Austravel members. Out-n-About is not simply a generic GPS logger application but purposefully designed to interrelate with and support Austravel's HF radio network, through its Teicall+ and H.E.L.P. (4357) systems. We will be testing band openings from 80 m to 10 m during April to see whether Austravel will work to Kununurra or Perth (or at least when) for remote

travellers on Christmas Island as additional safety net for visitors. Longer term it is possible CIARC can install and manage a base station here to provide the same backup back to Western Australian travellers or even those further afield. With an installed base, it would also provide another string to the emergency service (WICEN) network that the CIARC can provide in case of cyclones or tsunamis to Christmas Island.

CIARC is also looking to add an aircraft transponder system, this time supporting Flight Aware application similar to that of Flight Radar24. This system receives transponder data from aircraft which it then converts to packets of information which it sends to Flight Aware over the Internet.

Cheers, Beers and 73s  
Christmas Island Amateur Radio Club

Douglas VK9JD,  
Founding President



## WIA DX & operating Awards



WIA offers a range of operating awards, including DXCC, VHF & UHF and many other awards.

Details can be found at: <http://www.wia.org.au/members/wiadxawards/about/>





# VK3news Geelong Amateur Radio Club

Tony Collis VK3JGC

## More changes at the GARC

### 1. Club Members Communications

In addition to the recent extensive renovations at the GARC club house there has also been a significant change in club member communication facilities.

Until May this year members used the Club FORUM feature on the VK3ATL website to discuss matters related to the club activities.

Whilst the club FORUM aspect is still available to members, there is now gravitation to the SLACK Application for individual member direct messages as well as committee communications and project activities.

SLACK provides email, text messaging and instant messaging for all club members logged onto the service and keeps all

the communication styles together in the one application.

SLACK has both desktop and mobile versions.

In using the SLACK Free Version the GARC currently pays \$0 per month but is restricted to 10,000 searchable messages, 10 app integrations, 5GB of file storage, no guest accounts and only 1:1 video chats.

### 2. The Acquisition of a Defibrillator

Barry VK3SY, the GARC's welfare officer, is currently investigating the acquisition of a Defibrillator for installation in the club house in addition to the existing first aid facilities. This is in recognition that no one is immune from Sudden Cardiac Arrest (SCA), which is a significant cause of death among adults in Australia and the world at large.

SCA is unpredictable and can strike anyone, of any age, anywhere at any time! It is typically adults above 40 years of age that are more frequently implicated with SCA with a clear bias towards males more than females. If a cardiac arrest happens, time is of the essence as use of the defibrillator within the first few minutes of an arrest is the most effective; otherwise by 10 minutes there is shown to be a very low chance of resuscitation. Ambulance Victoria has an average response time of over 11 minutes.

### 3. Security at the club house

Lee VK3PK has now installed an 8 camera cctv system with 7 x 24hr operational access to all areas of the club house; this compliments the existing motion detecting alarm system in the club entrance that has been in use for several years.



Photo 1: Barry VK3SY.



Photo 2: Lee VK3PK.



## VK7news

Justin Giles-Clark VK7TW

[e vk7tw@wia.org.au](mailto:vk7tw@wia.org.au)

[w https://groups.io/g/vk7arnews](https://groups.io/g/vk7arnews)

### Queen's Birthday Honours

Joe Gelston VK7JG (SK) OAM



Photo 1: Joe Gelston VK7JG at a Meet the Voice event in Ross, Tasmania. (Photo courtesy of Alvin VK7ADQ).

A posthumous OAM was awarded to Joe Gelston VK7JG (Silent Key) in the 2019 Queens Birthday Honours for services to amateur radio. Joe was known to many people in amateur radio around the world and was a regular at the GippsTech microwave conference weekends.

Joe was known for his endless energy for the hobby and boundless support and assistance for anyone who showed an interest in amateur radio. His depth of knowledge and skill in radio was immense. His enthusiasm was infectious and he was the driving force behind getting many radio projects started and completed.

Joe touched and/or was involved in the creation and maintenance of almost every amateur radio repeater and beacon in Tasmania. It is without a doubt

that Joe had been to every hill and mountain-top that has a communications facility on it in mainland Tasmania and surrounding islands.

He also volunteered his time and skills to keep many volunteer organisations radio repeaters on air - notably Tamar Sea Rescue Services. This dedication to duty saw many repeaters, beacons and communications facility kept on air even when natural disasters and emergencies happened.

Joe was successful in gaining his Amateur Operators Limited Certificate of Proficiency in October 1965 and was issued with VK7ZGJ. In August 1976, he sat for his full call and requested VK7JG.

Joe appears on the WIA Tasmanian Division Honour Roll as Secretary of the Division in 1975. Joe was made an Honorary Life Member of the WIA in 1993 and received a WIA President's Commendation in 2014. He also set a number of VHF-UHF DX records. Joe sadly died on 29th May 2018.

### King Island District High School ARISS Contact

King Island is located in the Bass Strait off the North West Coast of Tasmania. The school has approximately 210 students from Kinder to Year 10. The contact with the International Space Station was with astronaut **David St-Jacques KG5FYI**. The event occurred on June 19, 2019 starting at 08:49 UTC. The contact was a telebridge contact operated by IK1SLD, located in northern Italy. The contact was covered by a number of the local television stations in Tasmania.

### WIA Annual Conference 2020

At the 2019 WIA Annual Conference in Sydney it was announced that the 2020 WIA Annual Conference will be held in Hobart on the 8-10 May 2020. The theme is Antarctic Gateway and so the tours and visits during the weekend all revolving around Antarctica and Radio.

This is a request for anyone who would be prepared to give a presentation on the Saturday afternoon on any aspect of amateur radio, Antarctica, radio, electronics, experimentation or all of these topics.

If you have a topic and or presentation or just an idea for one then please contact Justin VK7TW at [vk7tw@wia.org.au](mailto:vk7tw@wia.org.au) to discuss.

### VKFF New Parks for Tasmania

Jonathan VK7JON lets us know that 43 new parks were added including conservation areas, recreation areas and nature reserves. There are now 142 parks to activate throughout the state, so no matter where you live, there is likely to be something in your local area. To find out more, please visit the World-Wide Flora and Fauna (WWFF) Australia website at [www.wwffaustralia.com](http://www.wwffaustralia.com).

### VK7 Broadcast 2018-2019 Review

The VK7 callback statistical wrap-up for the 2018-2019 year is:

Frequency	Sub-Total
2 m Repeater	2746
70 cm Repeater	227
HF Rebroadcasts	901
DMR Rebroadcasts	423
DATV Rebroadcasts	280
<b>Total:</b>	<b>4577</b>

The WIA Annual Conference signals the start to a new WIA and VK7 News Broadcasting year.





Photo 2: Rider 42 passing RFID checkpoint in the Jill Sheehan Memorial Ride. (Photo courtesy of Roger VK7ARN).

The VK7 call back statistical wrap-up for the 2018-2019 year is:

This total is 4.2% of total VK callbacks. This shows that VK7 is punching above its weight as our VK7 licence number account for 3.3% of total VK licence numbers.

**North West News**

**North West Chat & Show Group**

Thanks to Eric VK7EV for this report. May 4, 2019 saw a great roll-up to the Chat & Show Group at the Penguin Sports Centre on the North West Coast of VK7. This was organised by Shirley VK7HSC and saw Terry VK7JAI bring along two home-brew Grid Dip Oscillators he built from articles in a 1955 Radio Television & Hobby Magazine. Terry gave an interesting presentation and demonstration of the units, thanks Terry.

Les VK7OT brought along his home-brew 20M loop antenna. The unit has a vacuum capacitor

allowing the unit to operate at high power and encouraged those gathered to consider building loop antennas themselves. The gathering finished with an afternoon tea and much discussion about interesting radio projects and equipment.

**North West Tas. Radio & TV Group (NWTR&TVG)**

<http://www.vk7ax.id.au/atvgroup/>

The June meeting of NWTR&TVG saw a special general meeting to amend its rules to allow \$5 membership for Amateurs under 18. This was put in place to encourage new Foundation calls to join.

At the main meeting, ex Broadcast Engineer Terry VK7JAI brought along some home brew valve projects including a 2 M converter, 2 x 6M Converters and a 10M Converter, built in the 1960s. As always a sumptuous afternoon tea, and banter between members made it an enjoyable afternoon.

The Club also wishes to advise the 6 Metre VK7RTV, currently located at Dazzler range, is off air till further notice.

**Northern News**

**Northern Tasmanian Amateur Radio Club (NTARC)**

<http://www.ntarc.net/>

NTARC provided safety communications for the Jill Sheehan Memorial Ride held on 9 June 2019 at Sassafra in North West VK7. RFID scanning provided automated timing information as each rider passed the two checkpoints. There were both 80 and 40 km rides and one of the checkpoints was used multiple times in multiple directions and so the scanners kept track. There was a minor issue that involved a call to Switzerland to programmer Peter VK7SP who was able to solve the issue.

Automatic tracking meant that results were able to be displayed almost real-time for riders and



Photo 3: L2R – WIA Past President Justin VK7TW presenting Certificate of Recognition to Alan VK7KAJ. (Photo courtesy of Warren VK7WN).

teams to view. Thanks to André VK7ZAB, Stefan VK7ZSB, Idris VK7ZIR, Rick VK7RI, Peter VK7KPC, Roger VK7ARN, Norm VK7KTN, Lorraine and long distance member Peter VK7SP.

The NTARC technical nights saw some interesting activities with Peter VK7KPC and his 10 MHz OCXO project and Military radios, Ross VK7ALH with his Geloso VFO module, Trevor VK7TB and his Rubidium standard disciplined master oscillator unit project, Kevin VK7HKN and André VK7ZAB playing Arduinos, Bernie VK7BR playing with precision motor drives, Simon VK7FSRM and Stuart VK7FEAT playing with computers and antennas and Paul VK7KPA playing 'Internet of Things' projects.

Peter VK7PD showed his home built 2.4 GHz amplifier and the Rex VK7MO 1296 MHz Yagi antennas which will be built in an up and coming antenna building workshop, Kevin VK7HKN set up his Buddipole portable antenna and swept it using his SARK antenna analyser, James VK7JAM brought along his new Ukrainian HF antenna analyser board and the his Rig Expert module and Idris VK7ZIR brought

in a Wagner 829 M HF marine transceiver. There were many other activities during these interesting nights.

## Southern News

### Radio and Electronics Association of Southern Tasmania Inc

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

<https://www.facebook.com/reasttas/>

In May 2019 we were privileged to have Andrew Klekociuk from the Australian Antarctic Division (AAD) who gave us a presentation on the history of Australian atmospheric research in Antarctica, from studies of aurorae, the ionosphere, magnetosphere, and cosmic rays to modern work on global climate modelling and related topics. Andrew is a Principal Research Scientist at the AAD where he has conducted research on the Antarctic atmosphere for over 30 years. Andrew covered many interesting areas of research that had definite interest for the radio amateur. A huge thank you to Andrew for coming along and presenting what research the AAD is undertaking. Thanks also to Warren VK7WN

for organising this wonderful presentation.

In June 2019 Ron Cullen gave a presentation on Radio Control Technology. This builds on Ron's earlier presentation in 2017 and went through his learnings and experimentation since the last presentation, as well as the new technology he has been playing with. Ron took us through a demonstration of two of his aircraft and the First Person View functionality and finished off with some videos he has taken testing the functionality. A huge thank you to Ron for his presentation.

Both these presentations are available on the REAST YouTube Channel.

The REAST DATV Experimenter's Night had a milestone with the new DATV studio back up and going and we are now streaming to the internet via the REAST YouTube channel as well as RF on 445.5 MHz DVB-T 7 Mhz in standard definition. John VK7FJPA was able to receive our RF signal on a SDR Dongle and TV rabbit ear antennas, Ron Cullen continued to experiment with his azimuth / elevation camera mount, Jet VK7FJET was has a project to



build a GPS Disciplined Oscillator and the author showed his 10 GHz EME Azimuth and Elevation rig using the K3NG GPS rotator controller.

On a DATV night after the WIA Annual Conference, Alan Jeffrey was presented WIA Certificate of Recognition and badge for 10 years as a Learning Facilitator for the WIA and Rex Moncur VK7MO was presented a WIA Technical Excellence certificate for digital weak signal Earth-Moon-Earth experimentation and record setting in the GHz bands.

### SK Bill Gwynne VK7KBG

It is with great sadness that I tell you of the death of Bill Gwynne VK7KBG. Bill had not been active on the bands for the best part of a decade. However, he still managed to keep some interest in the hobby via listening to the Sunday Broadcasts and of course recounting stories of good DX during that wonderful cycle of the mid to late 1980's.

Bill's health deteriorated somewhat in the last few months and he was taken to hospital on Saturday morning, the 25th of May 2019. He died peacefully there the following morning, Sunday 26th of May.

RIP

(Myles Gwynne. VK7GZ, Bill's son)

### SK Jack Jordan VK7IL

It is with sadness we tell you that Jack Jordan, VK7IL went Silent Key on 18 June 2019. Jack was an active amateur for many years. He operated mainly on HF and VHF, where he made many friends. He was first licensed in 2001 as a Novice, upgrading to a full-call in 2002. He provided the Sunday Broadcast relay on 20m for many years.

He was born in Geelong and at about age 5 moved with his family to King Island where his father was a lighthouse keeper - and also the local electronics technician. His father was a licensed amateur with the call VK7IL (Island Light), and when he passed away Jack took the

call in his memory.

Jack had two brothers, both amateurs: Bob VK7JR and Laurie VK2ALV, sadly both silent keys.

Jack had regular skeds with Bob on 80m where they discussed their interest in the "turf", and a daily 20m sked with Laurie to keep abreast of family doings and brewings.

Jack was a Wool Classifier in his professional life, gaining his qualifications at the Gordon Institute in Geelong. He then worked all over Australia in the wool industry, finally settling in mainland Tasmania where he and Doreen married and raised a family of two daughters. His anecdotes about his experiences when travelling around were legend.

He was a keen gardener and loved fishing and was a first-class billiards player. Other interests were his Bowls Club and the horse-racing industry.

Jack leaves his wife Doreen and two daughters Amanda and Linda.

Vale Jack

(Harry Young VK7AR)



## AMSAT-VK

AMSAT Co-ordinator  
Paul Paradigm VK2TXT  
email: [coordinator@amsat-vk.org](mailto:coordinator@amsat-vk.org)

Group Moderator  
Judy Williams VK2TJU  
email: [secretary@amsat-vk.org](mailto:secretary@amsat-vk.org)

Website:  
[www.amsat-vk.org](http://www.amsat-vk.org)

Group site:  
[group.amsat-vk.org](http://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 Australian National Satellite Net is held on the second Tuesday of the month (except January) at 8.30 pm eastern, that's either 9.30 or 10.30Z depending on daylight saving. Please note we will be taking check-ins from 8.20pm-ish. 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. Operators may join the net via EchoLink by connecting to 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. 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**  
VK4RRC Redcliffe 146.925 MHz -ve offset IRLP node 6404 EchoLink 44666

**In South Australia**  
VK5TRM, Loxton on 147.175 MHz  
VK5RSC, Mt Terrible on 439.925 MHz IRLP node 6278,  
EchoLink node 399996

**In Tasmania**  
VK7RTV 2 m. Repeater Stowport 146.775 MHz. IRLP 6616

**In the Northern Territory**  
VK9BMA, Katherine on 146.750, CTCSS 91.5, IRLP Node 6800

We are keen to have the net carried by other EchoLink or IRLP enabled repeaters and links in order to improve coverage. If you are interested in carrying our net on your system, please contact Paul via email. Frequencies and nodes can change without much notice. Details are put on the AMSAT-VK group site.

### Become involved

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

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



# WIA Awards

Marc Hillman VK3OHM/VK3IP

Below are listed all New awards issued from 2019-04-15 to 2019-06-14, plus all updates to DXCC awards.

Go to <http://www.wia.org.au/members/wiadxawards/about/> to use the online award system.

## New awards

### Antarctic

#	Call	Name	Mode
106	VK3SIM	Simon Keane	Open
107	VK3SIM	Simon Keane	Digital

### DXCC Multi-band (1)

#	Call	Name	Mode	Band	Count
216	R80D	Dmitriy Osipkin	CW	20m	101
217	R80D	Dmitriy Osipkin	Open	20m	136
218	R80D	Dmitriy Osipkin	Digital	20m	110
219	VK3KTT	Steven Barr	CW	20m	101
220	VK2BY	Bradley Devon	Open	20m	117
221	VK3MH	Brendan Bryant	Digital	20m	123

### DXCC Multi-band (3)

#	Call	Name	Mode	Band	Count
138	VK3VM	Stephen Ireland	Digital	40-30-20m	346
139	R80D	Dmitriy Osipkin	Open	40-20-15m	374
140	R80D	Dmitriy Osipkin	Digital	40-20-17m	316
141	VK3OHM	Marc Hillman	Digital	40-30-20m	351

### DXCC Multi-mode (CW)

#	Call	Name	Count
262	R80D	Dmitriy Osipkin	152

### DXCC Multi-mode (Digital)

#	Call	Name	Count
87	R80D	Dmitriy Osipkin	137
88	VK2BY	Bradley Devon	109
89	VK4QG	Allan Downie	106

### DXCC Multi-mode (Open)

#	Call	Name	Count
471	VK2IO	Gerard Hill	127
472	VK3GQ	Peter Carew	100
473	VK2BY	Bradley Devon	126
474	VK3ANL	Nicholas Lock	100
475	VK4QG	Allan Downie	106

## Grid Square

#	Call	Name	Mode	Band
380	R80D	Dmitriy Osipkin	CW	HF
381	R80D	Dmitriy Osipkin	Digital	HF
382	VK1DC	Emma Cuthbert	Open	HF
383	VK1DC	Emma Cuthbert	Digital	HF
384	VK2BY	Bradley Devon	Open	HF
385	VK2BY	Bradley Devon	Phone	HF
386	VK2BY	Bradley Devon	Digital	HF
387	VK5NNN	Ivan VUJIC	Open	HF
388	VK4EME	Allan Downie	Open	70cm
389	VK4EME	Allan Downie	Digital	70cm
390	VK4QG	Allan Downie	Open	HF
391	VK4QG	Allan Downie	Digital	HF
392	VK3MH	Brendan Bryant	Phone	HF

## IARU Worked All Continents (Basic)

#	Call	Name	Mode	Band
86	VK4EME	Allan Downie	Open	70cm
87	VK4EME	Allan Downie	Digital	70cm

## Worked All States VHF

#	Call	Name	Mode	Band
227	VK4QG	Allan Downie	Open	6m
228	VK4QG	Allan Downie	Digital	6m

## DXCC updates

### DXCC Multi-band (1)

#	Call	Name	Mode	Band	Count
97	VK6WX	Wesley Beck	CW	20m	150
168	VK3FZ	Roger Stafford	CW	10m	125
201	VK3SIM	Simon Keane	CW	20m	158
210	VK2FR	John Sharpe	CW	20m	113
54	VK3EW	David McAulay	Digital	20m	223
89	VK3OHM	Marc Hillman	Digital	20m	145
106	VK3SIM	Simon Keane	Digital	20m	195
162	VK3AWG	Christopher Bellmont	Digital	20m	181
190	VK3BDX	David Burden	Digital	20m	193
207	VK3VM	Stephen Ireland	Digital	20m	125
221	VK3MH	Brendan Bryant	Digital	20m	123
1	VK3OHM	Marc Hillman	Open	20m	216
17	VK6WX	Wesley Beck	Open	20m	223
20	VK3SX	Bob Robinson	Open	20m	336
34	VK3KTT	Steven Barr	Open	20m	238
104	VK3SIM	Simon Keane	Open	20m	259
108	VK3AWG	Christopher Bellmont	Open	20m	234
189	VK3BDX	David Burden	Open	40m	209
206	VK3VM	Stephen Ireland	Open	20m	127
215	VK3MH	Brendan Bryant	Open	20m	148
11	VK3EW	David McAulay	Phone	20m	340
35	VK3KTT	Steven Barr	Phone	20m	212
39	VK6WX	Wesley Beck	Phone	20m	175
52	VK2FR	John Sharpe	Phone	20m	274
56	VK3OHM	Marc Hillman	Phone	20m	175
105	VK3SIM	Simon Keane	Phone	20m	189
107	VK3AWG	Christopher Bellmont	Phone	20m	161



### DXCC Multi-band (3)

#	Call	Name	Mode	Band	Count
24	VK3EW	David McAulay	CW	30-20-17m	905
37	VK7CW	Steven Salvia	CW	30-20-17m	773
66	VK3EW	David McAulay	Digital	40-30-20m	595
125	VK3SIM	Simon Keane	Digital	40-30-20m	500
132	VK3BDX	David Burden	Digital	40-30-20m	554
138	VK3VM	Stephen Ireland	Digital	40-30-20m	346
30	VK3SX	Bob Robinson	Open	40-20-15m	713
36	VK7CW	Steven Salvia	Open	30-20-17m	813
67	VK3SIM	Simon Keane	Open	40-20-15m	652
69	VK3KTT	Steven Barr	Open	20-15-10m	573
95	VK3OHM	Marc Hillman	Open	40-20-15m	521
112	VK6WX	Wesley Beck	Open	40-20-15m	532
126	VK3AWG	Christopher Belmont	Open	20-17-15m	526
131	VK3BDX	David Burden	Open	40-30-20m	584
137	VK3VM	Stephen Ireland	Open	40-30-20m	349
23	VK3EW	David McAulay	Phone	40-20-15m	988
31	VK3SX	Bob Robinson	Phone	40-20-15m	705
43	VK2FR	John Sharpe	Phone	20-15-10m	636
68	VK3KTT	Steven Barr	Phone	20-15-10m	514
124	VK3SIM	Simon Keane	Phone	20-15-10m	400

### DXCC Multi-mode (CW)

#	Call	Name	Count
189	VK6DU	Lance Martin	330
217	VK3VT	Greg Williams	283
223	VK6WX	Wesley Beck	220
233	VK3SIM	Simon Keane	226
234	VK3KTT	Steven Barr	164
247	VK2FR	John Sharpe	164
249	VK3FZ	Roger Stafford	231
257	VK3AWG	Christopher Belmont	146

### DXCC Multi-mode (Digital)

#	Call	Name	Count
20	VK3EW	David McAulay	302
25	VK3OHM	Marc Hillman	187
26	VK3VT	Greg Williams	211
40	VK3SIM	Simon Keane	236
47	VK3AWG	Christopher Belmont	211
71	VK3BDX	David Burden	231
72	VK3VM	Stephen Ireland	164
79	VK3KTT	Steven Barr	145
82	VK6WX	Wesley Beck	127
85	VK3MH	Brendan Bryant	157

### DXCC Multi-band (5)

#	Call	Name	Mode	Band	Count
21	VK3EW	David McAulay	CW	40-30-20-17-15m	1415
35	VK7CW	Steven Salvia	CW	40-30-20-17-15m	1185
79	VK3EW	David McAulay	Digital	40-30-20-17-15m	915
89	VK3SIM	Simon Keane	Digital	40-30-20-17-15m	754
96	VK3BDX	David Burden	Digital	80-40-30-20-17m	804
34	VK7CW	Steven Salvia	Open	40-30-20-17-15m	1249
47	VK3SX	Bob Robinson	Open	40-20-17-15-10m	1012
48	VK3SIM	Simon Keane	Open	40-30-20-17-15m	1017
93	VK3AWG	Christopher Belmont	Open	40-30-20-17-15m	747
94	VK3BDX	David Burden	Open	80-40-30-20-17m	844
95	VK3OHM	Marc Hillman	Open	40-30-20-15-10m	732
98	VK6WX	Wesley Beck	Open	40-30-20-17-15m	771
2	VK3EW	David McAulay	Phone	40-20-17-15-10m	1610
52	VK3SX	Bob Robinson	Phone	40-20-17-15-10m	991

### DXCC Multi-mode (Open)

#	Call	Name	Count
328	VK6DU	Lance Martin	336
363	VK3OHM	Marc Hillman	259
370	VK3KTT	Steven Barr	277
376	VK6WX	Wesley Beck	273
381	VK3VT	Greg Williams	319
390	VK6SJ	Stephen Kennedy	175
397	VK3AWG	Christopher Belmont	272
423	VK3SIM	Simon Keane	295
458	VK3BDX	David Burden	244
459	VK3VM	Stephen Ireland	165
470	VK3MH	Brendan Bryant	188

### DXCC Multi-band (7)

#	Call	Name	Mode	Band	Count
10	VK3EW	David McAulay	CW	80-40-30-20-17-15-12m	1822
14	VK7CW	Steven Salvia	CW	40-30-20-17-15-12-10m	1545
15	VK7CW	Steven Salvia	Open	40-30-20-17-15-12-10m	1633
35	VK3FZ	Roger Stafford	Open	40-30-20-17-15-12-10m	1169
41	VK3SIM	Simon Keane	Open	40-30-20-17-15-12-10m	1266
8	VK3EW	David McAulay	Phone	80-40-20-17-15-12-10m	2184

### DXCC Multi-mode (Phone)

#	Call	Name	Count
569	VK3OHM	Marc Hillman	232
573	VK6WX	Wesley Beck	226
575	VK3KTT	Steven Barr	256
576	VK3VT	Greg Williams	212
601	VK3SIM	Simon Keane	233
602	VK3AWG	Christopher Belmont	201
626	VK3BDX	David Burden	114
628	VK3MH	Brendan Bryant	130

### DXCC Multi-band (9)

#	Call	Name	Mode	Band	Count
12	VK3EW	David McAulay	CW	160-80-40-30-20-17-15-12-10 m	2159
1	VK3EW	David McAulay	Open	160-80-40-30-20-17-15-12-10 m	2812

## Over to you

### An Interesting Exercise - Antenna Testing



I became aware of discussion on our local repeater between Max Brighton VK3ZMT and Garry Briant VK3KYF – regarding their efforts to tune an “off centre-feed dipole antenna”.

I understood they couldn't make any sense of the test results, although all aspects of the installation had been separately checked; i.e. coaxial cable, balun and connections.

Casually listened to the ongoing

comments – my only input was to ask the question, “have you tried a noise bridge?”

After several months of changing the antenna dimensions and ongoing testing, I received a telephone call asking can you come and assist. Looking for the easy way out I decided not to take my noise bridge equipment; instead I took our club analyser, (Rig Expert AA-230PRO)

Imagine the reaction when my first scan showed a very nice sharp clean dip on 80 metres. Then, reducing the scan width, the antenna proved to be more than usable on that band.

Both Max and Garry were using “up-market” analysers. One of those analysers had a readout showing both resistance and reactance with the frequency scan display.

A clue to the problem – both the R & X readings were moving continually; a classic situation of broadcast station pick-up.

Several broadcast stations are located within a radius of seven kilometres from Max Brighton's QTH. Those stations include a 2KW AM station, two high power FM stations, plus low power AM and FM stations.

His beautifully engineered system consists of a HF log beam, two metre and seventy centimetre yagis, plus two dipoles all installed on a seventeen metre guyed mast. Certainly that installation would be a good antenna for the AM broadcast band. (Photo)

From experience, RF pick-up from a local AM station is usually the culprit.

And that seemed to be confirmed later when ZMT reported breakthrough from the AM two kilowatt station, while using the OCF dipole.

So what could be done? We tried a basic earth connection on the coaxial cable at the test point near the shack, with little change. ZMT had already installed a reasonable earth at the base of mast.

Interestingly, if the “old procedure” of testing with a few watts and a SWR meter had been used – their early testing would have been successful.

But the question still remains; why did one analyser provide a clean locked up display, while the other two were affected by RF pick-up? Something for further investigation!

It's over to you.

Noel Ferguson VK3FI  
[ronald.ferguson8@bigpond.com](mailto:ronald.ferguson8@bigpond.com)



### Plan ahead

Operate within the band plans:

<http://www.wia.org.au/members/bandplans/about/>



# DX Leader Board 2018

Marc Hillman VK3OHM

Places in category are coloured **First** **Second** **Third**

Year: 2018 

## All grades DX Leader Board for 2018 (Top 30)

Call	Name	DXCC	Open	Phone	CW	Digital
VK3GA	Graham Alston	256	623	88	210	450
VK3BDX	David Burden	219	747	145	133	674
VK5GR	Grant Willis	197	645	115	280	542
VK3EW	David McAulay	196	621	85	189	477
VK3SIM	Simon Keane	192	464	32	85	402
VK3AWG	Christopher Bellmont	192	470	61	58	409
VK2CA	Allan Meredith	188	565	136	178	454
VK3VT	Greg Williams	177	357	36	108	272
VK5BC	Brian Cleland	173	606	52	66	559
VK4CAG	Graeme Dowse	172	502	26	42	460
VK3VM	Stephen Ireland	140	368	0	0	368
VK6DW	Ian Cook	138	423	123	83	362
VK7CW	Steven Salvia	134	371	13	367	4
VK3OHM	Marc Hillman	129	258	22	16	239
VK5SA	Chris Levingston	119	295	32	11	275
VK4CC	Colin Clark	117	202	16	8	182
VK4SN	Alan Shannon	117	251	9	117	208
VK3KTT	Steven Barr	116	221	69	54	146
VK3FZ	Roger Stafford	116	260	10	15	244
VK1DJA	David Abel	114	199	0	0	199
VK6WX	Wesley Beck	107	224	26	109	135
VK3MH	Brendan Bryant	104	191	47	10	173
VK5SFA	Steve Adler	104	208	27	6	196
VK3HJ	Luke Steele	103	215	29	174	51
VK3EY	Robert Puise	99	240	58	1	218
VK2IO	Gerard Hill	97	169	24	40	140
VK5DG	David Giles	95	227	2	0	225
VK2ZQ	Michael Ramsay	87	134	5	0	133
VK4KEE	Robert Hollis	82	163	8	7	149
VK3GK	Lee Moyle	72	142	71	98	10

## Foundation DX Leader Board for 2018 (Top 10)

Call	Name	DXCC	Open	Phone	CW	Digital
VK5FMAZ	Marija Simmonds	1	1	1	0	0

## Silent Key

Victor Hee VK2KVH



Sadly, the Fisher's Ghost Amateur Radio Club advise that their friend and club life member Victor Hee VK2KVH passed away at home on 1 June 2019 aged 92 years.

Victor was born and raised in QLD before moving to NSW where he became a Freemason and began a career with AIS (now BHP). He loved the graveyard maintenance shift because, if there were no breakdowns, he could sleep all night then go home.

Victor became interested in amateur radio in the early 1980's and obtained his advanced licence in 1984. He had been a member of several Sydney and regional clubs before joining the Fisher's Ghost Amateur Radio Club in 2000. He was always very generous and the club station at Cataract Scout Park is adorned with many of his donations including antennas and the BBQ. He was always willing to help with club activities, including the 2010 and 2016 Scout Jamborees. He was elected a life member of the club in 2016. Victor's location at Wilton was ideal for access to many repeaters across the Sydney area and he was often heard on them.

Victor's other interests included photography and cars. Unfortunately, in recent years Victor was unable to drive, but other club members were always happy to pick him up from home to take him to club activities.

Farewell Victor, from all your friends in the Fisher's Ghost Amateur Radio Club. You will be missed and never forgotten.

Vale Victor Hee VK2KVH

Submitted by Peter Richardson VK2PR

# Receive SSB on your 27 MHz AM CB

Peter Parker VK3YE (\*)

27 MHz AM-only CB radios still often come up at hamfests. But unless you have a nearby friend also with one, they're not very useful in their existing form. Local CB communication has largely gone to UHF while hobby CBers mostly only operate SSB.

One way an old CB can be useful is as a stand-alone monitor receiver to detect likely sporadic-E openings on 10 and possibly 6 metres. There are more CBers than amateurs. When the band opens 27 MHz signals come in from all over Australia, particularly on channel 35 (27.355 MHz LSB). The only problem is that all you'll hear there on your AM CB is 'duck talk' and won't know where stations are located.

The way to resolve that is to fit a beat frequency oscillator (BFO). Provided it's set correctly SSB signals will come in loud and clear. You may even be able to have cross-mode AM/SSB contacts with SSB operators who won't believe how you're resolving their signals on an AM set.

The normal way to operate a BFO is to have it operating on the CB's last intermediate frequency (often 455 kHz). However you will need to open the set to install it and often there's not much room. Further complicating things is the need to find spare panel space to install a 'clarifier' control to tune in off-frequency stations. Also, with the diode envelope detector that AM CBs mostly use, it is desirable to be able to vary the BFO's output to allow both weak and strong signals to be resolved.

The alternative, adopted here, is to use an external beat frequency oscillator operating directly on the 27 MHz receive frequency. This requires no opening up of or physical connections to the CB. You can vary the strength of the BFO's injection to suit different signals.

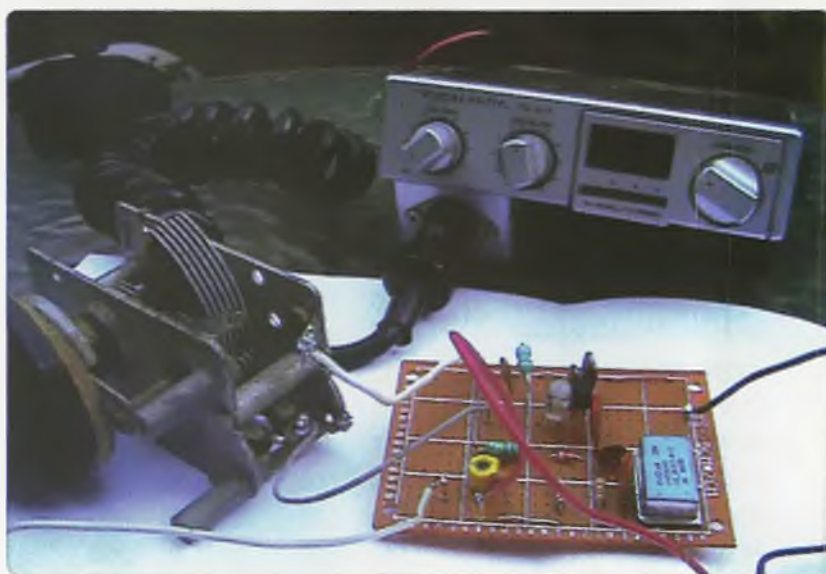


Photo 1: In use with 27 MHz CB.

And you can change its frequency to receive off-frequency stations. The main pitfall is the need to adjust it each time you change channel.

Another downside is that because AM CBs have a wide IF filter you won't be able to separate stations if both lower and upper sidebands of the same channel are in use. Luckily most CBers use LSB and 27 MHz is seldom crowded so it's rarely a problem in practice.

How do you generate a stable enough signal on 27 MHz? The easiest way is just to go out and buy a DDS VFO like those offered by OzQRP. Or you could build one. One option is to use a free-running oscillator directly on 27 MHz. That will work but will drift terribly. That is unless you're careful with construction and use top-quality components, buffering, shielding and voltage regulation. Try it by all means but expect to spend much time making it stable.

A better alternative is to use a premix VFO. This is where you mix a free-running VFO (on a lower frequency) with a stable crystal

oscillator on a higher frequency. The resultant 27 MHz output is much more stable than if you were to generate it directly because of the VFO's better stability. This works because a 3 MHz VFO with a given parts per million frequency drift has only one-tenth the amount of hertz drift as one operating on 30 MHz. And, for this exercise, the crystal oscillator's drift can be treated as negligible.

Although it uses three stages (free-running VFO, crystal oscillator and mixer), the premix arrangement is simpler than it sounds. This is thanks to the use of a crystal oscillator module and simple diode mixer. Because we just need a narrow tuning range (possibly only a single CB channel) and we're not directly handling received or transmitted signals, performance requirements are greatly relaxed. In particular elaborate balanced mixers or multiple RF bandpass filters are not needed and the result is very simple indeed.

The next challenge is to select the frequencies needed to get your desired 26.965 – 27.405 MHz tuning



range. This will be dictated by the crystal oscillator modules you have available. Look in old computers if you don't have any immediately to hand. Another consideration is that you don't want the free-running VFO to be on too high a frequency otherwise it will drift. Whichever you choose the sum or difference between the oscillator module's frequency (or harmonic) and the VFO frequency must be at 27 MHz.

I chose a common 10 MHz crystal oscillator module and a 2.5 – 3.1 MHz local oscillator/VFO. How does this work? First of all, unfiltered crystal oscillator modules are rich in harmonics. For a 10 MHz module the nearest harmonic to 27 MHz is 30 MHz. A VFO around 3 MHz is required to mix with this 30 MHz to provide the desired 27 MHz. You will note that the local oscillator's signal is being subtracted rather than added to the oscillator's harmonic. Subtraction means that if you want to tune a higher channel on 27 MHz then you will need a lower VFO frequency. This is 2.645 MHz for 27.355 (Channel 35).

Can this arrangement work on other frequencies, including amateur bands? It wouldn't if we added RF filters to reject all but the 30 MHz harmonic output from the oscillator module, all but the 3 MHz fundamental from the VFO and all but 27 MHz from the diode mixer's output. But since (for all but the mixer output) we haven't inserted filters, outputs on multiple frequencies will be available, especially if you change the mixer's output tuned circuit to suit.

The most obvious that springs to mind with the above oscillator module/VFO combination is 6.9 – 7.5 MHz, ie the amateur 40 metre band. This is generated by subtracting the 3 MHz VFO from the 10 MHz fundamental signal from the oscillator module. You are likely to also find weaker and less stable signals at double, triple and quadruple that (ie the amateur 20, 15 and 10 metre bands) due to harmonic generation in the crude diode mixer used. Calculating all

the mixing possibilities, involving both fundamental and harmonics of both the oscillator module and VFO would be an interesting rainy-day exercise. The long list generated will demonstrate why you would not use this arrangement for transmitting or critical receiving purposes without adding extra filtering.

## Components

I've tried to use common parts. Old computers often have oscillator modules. Any type with its fundamental or harmonic within 2 to 5 MHz of 27 MHz should work. Note though that if you use other than a 10 (or 30) MHz oscillator you will need to change the local oscillator's frequency to suit. A pre-wound RF choke is used for the VFO coil though you could wind your own if desired. The 40pF trimmer capacitor is a 'nice to have' and can be replaced with a fixed 33 pF disc ceramic capacitor if without one.

The variable capacitor is possibly the hardest to find, especially if you wish to use an air dielectric type with a built-in reduction drive for easier tuning. A plastic dielectric type such as found in old transistor radios is another option. Its frequency stability won't be as good but should still be adequate. Tuning ease can be improved if instead of

tuning a 600 kHz span, series and parallel capacitors are added to give a 100 to 300 kHz span. Most 27 MHz SSB CB activity is between about channel 16 and 40, with a concentration in the upper 100 kHz.

## Construction and testing

The construction method used is not critical. I'd normally use 'dead bug' style but the IC-style oscillator module made matrix board easier. Most of the rest of the circuit was built 'open air' to test. It was later transferred to the matrix board pictured when satisfied with performance. Firm mounting of parts and a shielded metal case are desirable to ensure frequency stability.

The BFO needs five volts. This is set by the requirements of the oscillator module; the VFO stage is not critical in this respect. I used a holder of 4 x AA NiMH batteries to operate the BFO. This should provide hours of use. Add a 7805 (or similar) voltage regulator IC if you wish to operate the BFO from 12 volts.

Test by placing the BFO near a general coverage transceiver or receiver capable of tuning up to at least 30 MHz. With a short wire from the receiver's antenna socket to near the BFO you should hear a strong signal on 10 MHz from the oscillator module. Harmonics

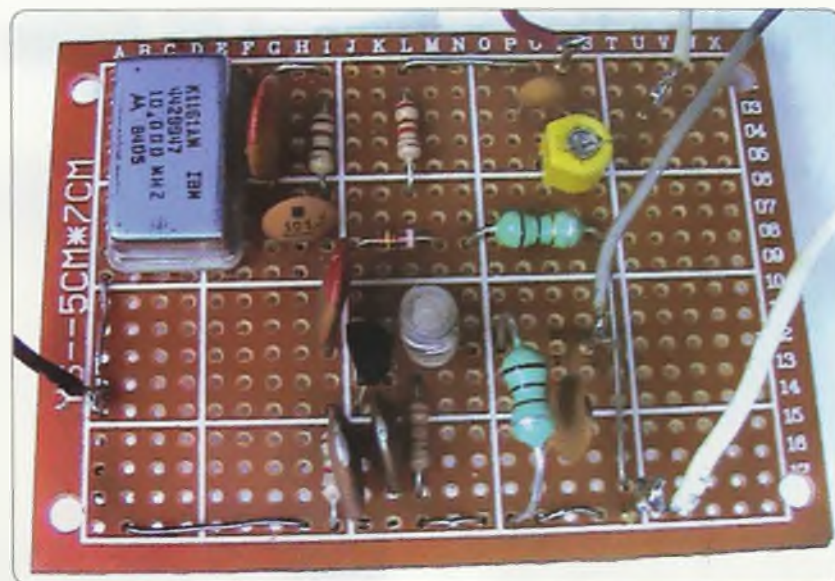


Photo 2: Circuit board.

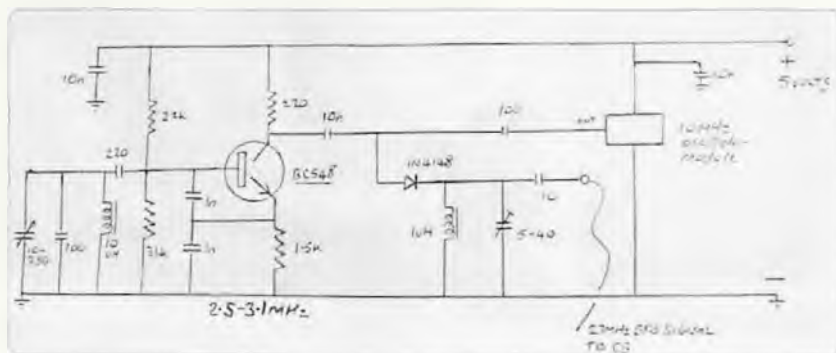


Figure 1: Circuit.

should be audible at 20 and 30 MHz.

Having confirmed the oscillator module is operating now check the VFO. This is slightly harder as its frequency is less certain. With the receiver set to wide bandwidth AM tune between about 2 and 4 MHz until you find its signal. It should move when you adjust the variable capacitor. The frequency range obtained will depend on its value but you need to cover at least 2.6 to 2.7 MHz for Channel 35 and surrounds. Add capacitance across the 100pF in the tuned circuit area if your range is too high and reduce it if it's too low.

Set the VFO to about 2.65 MHz. With the pick up wire near the diode mixer you should hear a signal around 27.35 MHz. Lowering the VFO to 2.6 MHz should move the

output to 27.4 MHz. Conversely moving the VFO to 2.7 MHz should give a signal on 27.3 MHz. These tests demonstrate that the diode mixer is operating. Don't be surprised if weaker and/or less stable signals are heard – these may be harmonics of the VFO or other mixing products as discussed earlier.

Adjust the 40pF trimmer capacitor with a screwdriver to peak its output on 27 MHz. A peak can be recognised by a maximum S-meter indication on your general coverage receiver or maximum silencing of band noise on the CB.

Now try to resolve some signals. To do this connect the CB to an antenna and put it on a vacant channel. Run a wire from the BFO's output to near the CB's antenna lead

near the back of the set. Tuning the BFO through its range should cause a 'woosh' and the background noise to quieten. Then find a channel with 'duck talk' and re-adjust the BFO carefully. As you tune it the signal should become intelligible. If the signal is strong and still sounding rough wrap the BFO's output wire several times around the antenna lead to increase injection.

As mentioned before the principle of using a BFO at signal frequency also applies for reception of amateur band SSB/CW signals, with 7 MHz (and harmonic bands) particularly promising with the crystal oscillator/VFO combination described. The only modification likely to be required is to drop the diode mixer output tuned circuit to 7 MHz. Replacing the 1 uH RF choke with one for 4.7 uH and placing a 68 pF disc ceramic capacitor across the trimmer should work.

### Conclusion

Described is a simple way to resolve SSB signals on a 27 MHz AM CB radio. Simple and cheap to build from available components, it is a good project to build if learning about RF oscillators, mixers and receivers.

(\*) vk3ye.com

## Finding that source of RF Noise with QRM.guru

David VK3RU

Like many amateurs, I live on a suburban block surrounded by local neighbourhood RF hash. My noise level on 40M was typically S9 plus with crackling interference. In the past the basic checks were completed, LED lights, solar inverter etc and without any real conclusion, became convinced the source was probably a local Plasma TV.

A recent presentation at my club, the EMDRC, included a discussion on QRM and methods to help amateurs identify noise sources and possibly resolve them.



Photo 1: Loop.



In conclusion, the club was presented with a Kill QRM kit, a bagged up kit of parts to help club members locate QRM sources and potentially fix the offending items. The kit is well documented on the QRM.guru site <https://qrm.guru/> and importantly includes the parts and instructions to build your own simple non-resonant DF loop and a stack of ferrite loops, rings and other necessary items to chase RF noise. Realising this might be of assistance in my own case, I was pretty quick to grab the brand new kit and build the loop.

I actually built my own version to test the concept, and then built one for the club. All and all, pretty simple to construct and it really works.

Keen to find my noise source with my trusty Icom T90A handy and newly constructed loop with 7.120Mhz on the dial, lo and behold, there was that noise! I spent a bit of time using the DF technique described in the supplied instructions and the noise seemed to come and go, this made things interesting. Of course I was heavily focussed on the neighbours which wasted considerable time and certainly did not help in the long run. So let us cut to the chase ....

The problem turned out to be my Merlin MTE120EVO garage door operator and as my garage has only one door, a very big motorised steel door, many wrong assumptions were made. The noise only appeared with the door down and safety light off. It was not there with the door up.

I called Merlin who initially was not very



Photo 2: My noisy garage door opener.

helpful and sent me off to the installer, offering to replace the unit under their generous 5 year warranty, but I pressed, insisting that a conversation with someone

technical would save a lot of time and cost.

After emailing Merlin, I pretty quickly received a call from their tech guy who was very helpful. He advised that there had been four previous RF noise related complaints (essentially to AM broadcast), now five, in many thousands of units distributed across the country. He went on to describe the unit programming having been designed to meet power consumption for Australian

Standards. In this case, the unit is default programmed to go into a "Low Standby Mode" when the door is down and light off. In this state the unit consumes <1W. When the door is up, the controller is in "Normal Standby Mode" consuming around 5W. So the problem is a noisy power supply when unloaded.

Replacing the power supply with a less noisy unit might be possible, but there is a work around in operator programming which simply keeps the unit in "Normal Standby Mode" fulltime, thus drawing a bit more current but importantly, keeping the noise down. It's all in the Merlin installation manual and after all, the difference between 1 W and 5 W at 240 Vac is hardly a concern when it comes to your power bill.

Good luck chasing your own sources of noise. Go to <https://qrm.guru/> or your local radio club and get started. For members of the EMDRC, our own kit is ready for action.

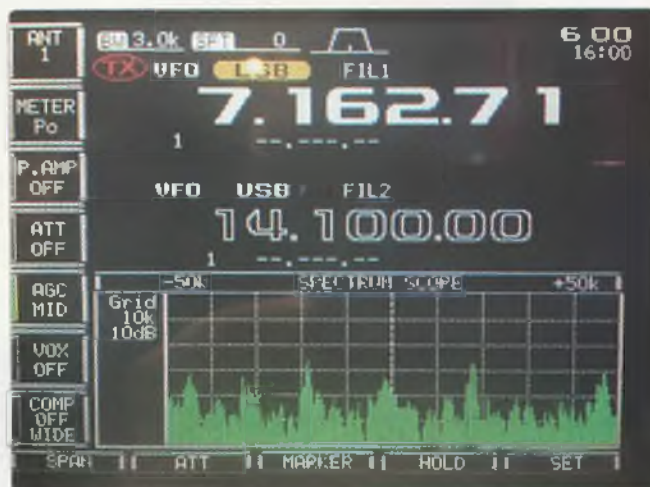


Photo 3: Noise problem.

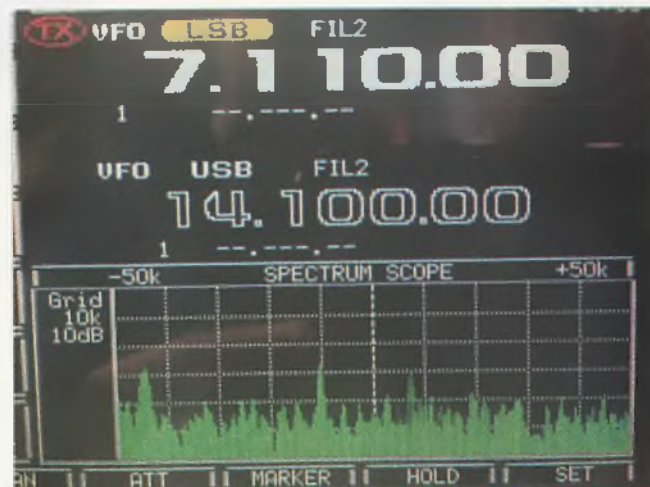


Photo 4: Noise fix.



## Contributions to *Amateur Radio*

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

Your contribution and feedback is welcomed.

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WIRELESS INSTITUTE OF AUSTRALIA

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