

# Amateur Radio

Volume 87  
Number 6 ▶ 2019  
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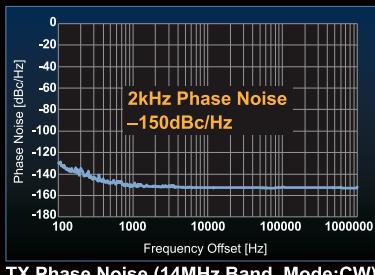
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# Amateur Radio

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### This month's cover:

Luigi Destefano VK3AQZ's homebrew HF/6M transceiver. See page 8 for the first of six articles describing this unit.

## Contributions to Amateur Radio



Amateur Radio is a forum for WIA members' amateur radio experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are welcome and will be considered for publication. Articles attached to email are especially welcome. The email are especially welcome. The

WIA cannot be responsible for loss or damage to any material. Information on house style is available from the Editor.

### Back Issues

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

### Photostat copies

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### Disclaimer

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

## Amateur Radio Service

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

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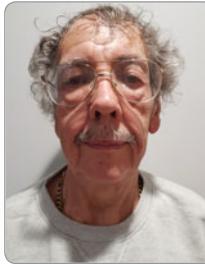
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# Editorial

Dr Harry Edgar VK6YBZ

Welcome to AR Magazine issue 6, the last for 2019. How fast has the year gone!

In this issue, we start a series on a HF transceiver – a most impressive “retro-style” homebrew device – which as well as being a great read, we hope it will inspire more construction of transmitting equipment. There are also several antennas to construct, including two compact magnetic loops. Plus our usual columns from across Australia.

The response to our recent call to WIA members for more technical articles has been most gratifying both in terms of technical interest, content quality and the number of submissions – but please don’t stop, we always need more technical articles – from simple hints and tips to multi-part articles.

Remember that any submission should have the text in editable format, such as MS Word .docx or .rtf (not PDF), photos separately in hi-resolution format (again not PDF). Refer to photos in the text as Figure 1 etc. Neat, hand-drawn circuit

diagrams are fine for simpler circuits – and with more complex diagrams PDF output from a drawing tool is actually preferred.

Reviews of lower to moderate cost test equipment are also most welcome, whether commercial or kits – such as the relatively low cost oscilloscopes and spectrum analysers now available, ESR meters or perhaps the economical VNAs now available. We are also seeking practical articles on “how to” for digital modes – such as DMR or OLIVIA (esp. RSID mode) – especially with the emission type restrictions now lifted for Foundation licence holders. Also DIY techniques for SMA construction and rework.

Next year will be a significant anniversary for the WIA, 110 years young! Not many organisations can trace their legacy back 110 years, especially membership based organisations with democratically elected boards. We are planning a number of historical articles,

Continued on page 5

### 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

As we hurtle in space orbiting around the sun at an average speed of 110,000 kilometres per hour towards the fast approaching end of another year, it is worth looking what is underway and planned in the near term that will impact the Amateur Radio Service in Australia. So let's first look at the biggest RF spectrum event for 2019:

## WRC-19

As you are probably already aware, the WIA has sponsored two WIA representatives to attend the World Radio Conference (WRC-19) this year as part of the WRC Australian delegation organised by the Australian Department of Communications (DOCA).

At the time of writing, the World Radio Conference 2019 (WRC-19) is now underway in Sharm El-Sheikh, Egypt and concludes November 22. This major event held by the ITU - a specialist agency of the UN - brings over 160 countries together to discuss and agree the sharing and use of radio spectrum across the globe and also, for satellites, in space. The Amateur Radio sector is represented globally to the ITU by the IARU. The WIA is represented by our two delegates, Dale Hughes and Peter Pokorny, who are members of the official Australian national delegation organised by DOCA.

Our delegates' scope is representation for the Australian Radio Amateur Service for all Australian Amateurs. This WIA representation, as the sole Australian AR peak body recognised by the IARU, is a major expense for the WIA. However, this representation considered the

highest priority for the WIA by WIA members. See details in the AR news section of this magazine.

The pressures for spectrum access to accommodate new uses for commercial purposes are intense; for an established service such as ours – the Amateur Radio Service, and any WRC that does not reduce our own useful spectrum access should be viewed as a success.

## WRC-19 Donations

National and international representation is considered one of the most important roles of the WIA by our members, if not, the most important. The WRC is a non-trivial expense for the WIA, and whilst it only occurs every 4 years - it will contribute substantially towards an operating deficit for this financial year and is only partially offset by kind donations we have received to date.

We are, of course, very grateful for the donations received but so far they cover only about 10% of our anticipated expenses for the preliminary DOCA and 6 APT meetings and the WRC-19 itself. The WIA posted a small operating surplus last financial year of \$23,000 – about \$6.50 a member; this surplus will only cover about one third of our cost estimates for the full APT (the Asia Pacific meetings) and WRC-19. We have had to attend the lead up meetings as a commitment of our membership of the national DOCA delegation, so options to reduce costs are very limited. So if you or your club can see your way clear to assist with a donation, even in small way, it would be very much

appreciated. Donations can be made directly by electronic funds transfer to the Wireless Institute of Australia Foundation (Account name), BSB 633-000, Account Number 161428578. Include the letters WRC and your callsign (or member number, but not both) in the details or contact us at [nationaloffice@wia.org.au](mailto:nationaloffice@wia.org.au) and assist us with this important Australian AR representation.

## ACMA AR Examination Syllabus Review

The Australian Communications and Media Authority (ACMA) has recently invited the WIA to form part of a Radio Amateur Service Syllabus review panel. The WIA will nominate two WIA Education team members to represent the WIA membership. The WIA panel representatives will be expected to liaise closely with the WIA Education team. ACMA retains sovereignty of the syllabus for the three licence classes and will be facilitating the review panel. The panel will be meeting in either Canberra, Sydney or Melbourne with video conferencing options after the first meeting.

Nominations to this panel will have closed by the time this issue is printed. Note that under the terms of the examination deed, the Australian Marine College (AMC) will be asked and expected to participate in this review. At the time of writing, the actual make-up of the full panel is not known.

The immediate and urgent task for the review panel is to update the existing Foundation licence syllabus to include the changes stemming

Continued on page 4

from the Licence Condition (LCD) changes now allowing, among other things, digital modes and construction of transmitting equipment. The WIA has already released on its website a four page update to our Foundation Manual addressing the impact of the LCD changes. See the recent news item for more details and to view the update addendum. It is important to note, at the time of writing, we have not been advised if the Foundation exams have been updated to fix the now out-of-date LCD answers – follow the instructions in our news item on our website.

It has been more than a decade since there has been an AR Syllabus review. It is important that we maintain our international compliance for the Advanced licence to meet the HAREC (Harmonised Amateur Radio Examination Certificate) standards for reciprocal licence issue.

### **YOTA – Youngsters on the Air**

Initiated a few years ago by IARU-region1, the goal of YOTA is to welcome new and young amateur radio operators to our amazing technology hobby. We live in a world where communication is being digitalised in a way that we almost can't keep up with. In times like this it's important to convince people about the importance of the Amateur Radio Service. Together with other youngsters all around the world, we can make the difference and give our hobby the future it deserves! YOTA is creating the next generation of amateur radio enthusiasts, bringing new energy into the hobby.

Recently **80 youngsters from 27 teams** in IARU R1 met in **Bankya near Sofia in Bulgaria** for the 8th edition of the Youngsters On The Air summer camp. It was a wonderful week full of diverse activities concentrated both on **practical and theoretical knowledge**, but also **many fun activities**. We explored different cultures and

shared the hobby that always brings us closer together. This year saw a lot of time dedicated to a new IARU project called "**Train-The-Trainer**" which teaches youngsters to **get more young people interested in amateur radio**.

With assistance from IARU Region 3, NZART and a number of others, Xenia Berger (ZL4YL) and Jaidyn Russell (ZL4WW) participated in, and represented Region 3 as observers at, the 2019 IARU Region 1 international youth camp held in Bulgaria. They said it was an absolutely amazing experience and it allowed them to meet many other young hams from all over the world, attend many interesting and informative lectures on topics from all ends of the amateur radio spectrum, have a go at building their own antennas and kits, and of course, have fun!

The IARU-R3 has advised that "An IARU Region 3 YOTA event will take place in Pattaya, Thailand in October 2020, and we hope all the IARU Region 3 member societies will send youth delegates as representatives to this event".

Save the date! Start thinking how we can put a young team together to represent AU at this event - both money and people needed! Visit the YOTA website at [www.ham-yota.com](http://www.ham-yota.com) for more information. The future of AR depends on our ability to engage more young people.

### **Foundation Licence Callsigns**

The recent changes to the LCD removing restrictions on emission modes has led to calls for the Foundation Licence holders to utilise a 6 character callsign instead of the current 7 character. In the WIA LCD Consultation response, a joint submission with ALARA, ARNSW and ARVIC we highlighted the issue with the 7 character callsign and certain digital modes, and proposed a solution that **provides the best possible long term solution for the Radio**

**Amateur community** – and was directly supported by over 4,500 members of the representative organisations.

The optimum solution, we firmly believe, is to remove the demarcation of licence class by "letter blocks" – a practice that started with the Z and Y calls for the Limited Licence over 50 years ago and allow any licence class , any 3 letter callsign. We believe there is no compelling reason to continue this demarcation practice into the future, given how easy it is the check licence class using the ACMA database. There are other alternatives, but none are as simple and straightforward as this approach, which will ultimately allow a "callsign for life". **This approach will have no effect on any existing licence holders at all, unless they elect to choose a new callsign.**

But it will allow Foundation (and Standard) licence holders to choose a 6 character VKNxxx licence via the standard application process – or do nothing and keep their existing callsign. 2 character suffix callsigns, due to the limited number available, will remain Advanced licence only. All other approaches are just workarounds, for zero long term benefit.

There has been a "kerfuffle" over a survey released on this topic released on social media. The survey that was released was severely compromised as:

1. It was released prematurely before other organisations, operating in good faith, could review and approve its content and release.
2. The answers to the questions did not have "null" options, such as "other" or "no preference", for instance, even if a respondent did not agree with any of the two options presented, they were forced to choose one of the options – destroying the integrity of answers. The WIA would never agree to such poor survey design.

3. The original intent from the WIA and its joint partners was to release an email linked survey – as I noted in my news broadcast on October 27 (recorded about 4 days prior to meet broadcast publishing deadlines). It was, unfortunately, released to social media.

By releasing to social media, it was released to a virtually unlimited audience – it was impossible

to know who was responding, how often (some claimed voting over 50 times by simple browser techniques) and whether they were Radio Amateurs or even based in Australia. The link was published on QRZ.com to an audience of at least a million potential respondents.

Hence why the WIA disassociated itself from the flawed social media survey. The WIA is working to address this outstanding

issue which will be in conjunction with its joint partners and affiliated clubs – and the ACMA. Whilst the holiday break may intervene, this is a priority for the WIA to resolve in the near term.

Seasons Greetings to all our members, staff and many volunteers. See you in 2020!

73

Greg VK2GPK

WIA President



## Editorial

Continued from page 2

curated with the help of Peter, the WIA Historian. And the WIA Radio & Electronics Convention in Hobart (see details this issue) will help celebrate this anniversary – we hope to see you –and friends / partners too - there in early May 2020.

As always, suggestions and constructive criticism is always appreciated (email: armag@wia.org.au or nationaloffice@wia.org.au). The editor has recently received a number of “letters to the editor” with

caveats of “Do not Publish” – whilst we will honour no-publish requests of course, there is much more value if we can share these opinions with the readership and create an open dialogue.

As is usual for this time of year, a nomination form is included with the mailed magazine for the half-board election of directors. A nomination form .pdf will also be available on the WIA site. Any questions should be directed to the WIA Returning Officer.

Please note that our Editor-in-Chief, Dr Harry Edgar, has stepped down from Editor-in-Chief role to undergo medical treatment. From the entire WIA PubCom team, we sincerely thank him for his wise counsel and contribution to the magazine strategy and continuity – and wish him well for a speedy recovery.

73, The Editorial Team (aka PubCom)



## WIA news

### IARU WRC19 Update - Week 2

The second week of the World Radiocommunication Conference WRC-19 was marked by intense discussions of the most contentious agenda items but very little closure. It is clear that long days and nights are ahead in the last two weeks.

**Meet the team:** There are 14 representatives of the IARU and its member-societies who are attending all or part of the WRC. IARU is admitted in a non-advisory capacity, which means that the three of us directly representing the IARU may attend meetings but may not speak in meetings unless asked by the chairman to provide information. That does happen occasionally, but most of our talking with delegates occurs in the hallways during breaks – in other words, lobbying. Three of us carry IARU credentials. President

Tim Ellam, VE6SH, was here for the second week. Secretary Dave Sumner, K1ZZ, and Dave Court, EI3IO, Chairman of the Region 1 Spectrum & Regulatory Liaison Committee, will stay until the final week.

The other 11 members of the IARU team, however, are on their national delegations and can (and do) directly participate: IARU Vice President Ole Garpestad, LA2RR, for Norway; Ulli Mueller, DK4VW, and Bernd Mischlewski, DF2ZC, for Germany; Murray Niman, G6JYB, for the UK; Ken Yamamoto, JA1CJP, for Japan; Hans Blondef Timmerman, PB2T, for the Netherlands; Flavio Archangelo, PY2ZX, for Brazil; Bryan Rawlings, VE3QN, for Canada; **Dale Hughes, VK1DSH, and Peter Pokorny, VK2EMR, for Australia;** and Jon

Siverling, WB3ERA, for the US. Bernd, Ken, and Peter made their contributions during the first half of the conference and have returned home.

***Through their dues the members of IARU member-societies in all three regions, and especially the Deutscher Amateur Radio Club, Radio Society of Great Britain, Japan Amateur Radio League, Radio Amateurs of Canada, Wireless Institute of Australia, and ARRL have helped to field the IARU team. [Ed: all of these member-societies directly sponsor their representatives on their respective national delegations].***

Continued on page 61

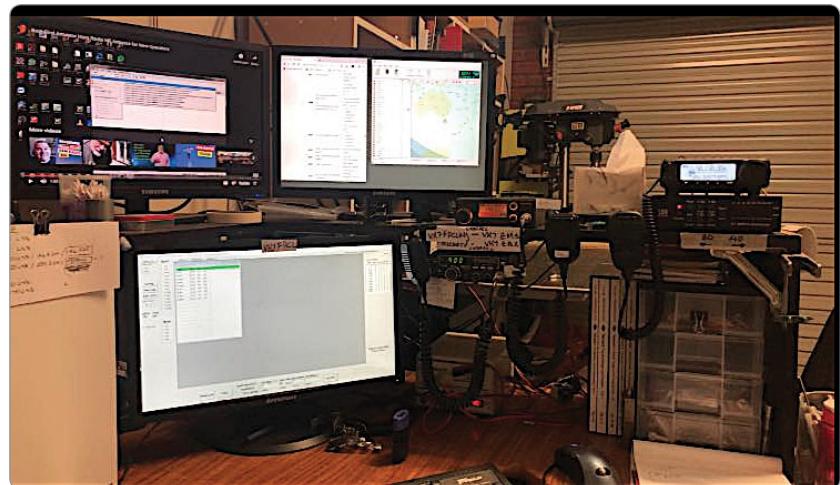
# VK7FPCL - First RD Contest

Paul Pruss VK7FPCL

Having been a Foundation class member for 16 months it was a bit of a secret of mine that I hadn't yet made a contact. In all that time I saved for a new HF radio, built several 40m kits, built antennas and slowly assembled equipment for what drew me into the Amateur Radio hobby - electronics. Something else grew during that time: MIC FRIGHT. I was quite comfortable Farnarkeling around in my shack and listening to what rag chews I could get with my 40m Delta Loop - thank you very much. Yet, in the back of my mind I knew that I'd have to "break the seal" one day.

As my friendships grew at my local radio club, REAST, in Hobart, this embarrassing little secret started to slip out. So, the day came when I was pitching in at a club working bee that Richard Howlett (VK7BX) and Murray Southwell (VK7ZMS) metaphorically pinned me down and said, "Hey, we've got just the thing to get you on the air - the RD is coming up in two weeks". The RD? I had no idea what that was as I was in no way paying attention to any kind of contesting calendar - no sir-re.

I responded that I can get on 40m and 80m and I have an old 70cm mobile rig but no UHF antenna. Richard and Murray just smiled and said that they would drop by and have a look at my location and see what could be done. Four days later Richard shows up in his work truck and starts unloading antennas, masts and cable. Murray turned up with a radio and an auto tuner. Before I knew it, I had a VHF and a dual band UVH/VHF antenna (thanks to



Station Layout.

Ben VK7BEN) mounted on my roof and feed line running through my garage window. A few radio checks later and I found myself committed to participating in my first RD Contest - what the heck have I done?

The next few days were spent in a panic labelling radios with operating frequencies, loading & learning log software and writing my call sign on post-it notes to stick all over my bench.

There was also food prep and water bottles to fill. Speaking of bottles, it was freezing in my garage so I had to get the LPG topped up for the gas heater and yes, Richard, I had proper ventilation and a CO alarm. I went through 4 kg of gas in 24 hours.

The day and time came and the official reading ended - I was contesting! I spent the first half hour just listening and experiencing the flow and cadence of the operators. I took the plunge and called out CQ RD. VK7ZMS responded and I had my first QSO.

The next 24 hours was great fun with all the same experiences that those of you that participated had. I could only "band dance" a little due to the frequencies that I was allowed to operate on. Well, that and the fact that there was not much happening on 40 and 80. I got better and better as the day advanced but interestingly and probably obviously to seasoned contestants, after about 12 to 15 hours I started making more mistakes; grabbing the wrong mic, tripping up on my call sign and fumbling log entries. All in all a really great experience.

Back at the club I felt a new kinship as members came up to me and said that it was great to work the RD with me and a big surprise to find that I had actually won the Foundation award for the day. Due to other commitments, I haven't been on the air since the RD but I can tell you one thing, it's not because of mic fright.

73, Paul, VK7FPCL



Join your local club

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

# 39th ALARA Contest Results

24 - 25 August, 2019

Sue VK5AYL	555	Top overall, Top phone, Top VK5 ALARA member
Linda VK7QP	502	Top VK7 Alara member
Catherine VK7GH	249	
Leonie VK2LDM	127	Top VK2 Alara member
Michelle VK2FMYL	77	Top Foundation licence ALARA member, Top Echolink
Lyn VK4SWE	72	Top VK YL CW, Top VK4 Alara member
Andrew VK3LTL	70	Top VK3 OM
Dot VK2DB	50	
Ngaire ZL2VJT	46	Top DX YL Alara member
Bryan VK3BWM	40	
Rhoderick VK2TTL	35	Top VK2 OM
Neil VK3NM	35	
Paula VK8ZI	28	Top VK8 Alara member
Norma VK2YL	23	
Derek VK3DEK	20	
Lesley VK5LOL	16	
Bev VK6DE	15	Top VK6 Alara member
Graeme VK6MIL	10	Top VK6 OM
Kim VK3FMIK	10	
Graeme ZL2APV	10	Top DX OM
Elizabeth VK2XSE	10	

## SUMMARY

ALARA members	13 (inc. 1 DX member)
OM	8 (inc. 1 DX OM)
TOTAL LOGS	21

It was great to have all the logs arrive by email this year – no waiting on snail mail to make the deadline! Again we must thank all those Oms who gave the girls points, even if they didn't put in a log. Congratulations to Sue VK5AYL who worked hard to achieve her first ever contest and took top points! I'm sure her OM Richard kept up her sustenance throughout – thankyou Richard. It was also great to see more use being made of Echolink this year as conditions do not improve very much on HF. Michelle VK2FMYL made a good score on this medium and I hope more use will be made next year, as 6 girls made use of it this year. Lyn VK4SWE also made a good score on CW. So now its time to look forward to another contest next year Thankyou everyone for taking part and supporting ALARA.

33 Marilyn VK5DMS  
ALARA Contest Manager



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# Homebrew HF Transceiver

## Part 1 Intro & Receiver

Luigi Destefano VK3AQZ

This is a large and detailed project and is split into four parts to be published over six editions of the magazine.

**Part1:** Introduction, block diagram, and receiver section. This article covers the receiver from the front end to the noise blanker, the next edition will cover the remainder of the receiver

**Part 2:** Transmitter section

**Part 3:** VFO system.

**Part 4:** Construction, testing and Conclusion.

### PART 1

#### Introduction

Over the years I have accumulated a number of components salvaged from previous homebrew projects and a variety of other sources. Many of these parts are still in good order and usable in a variety of projects. So rather than ending up in landfill, I have used some of these parts in

a homebrew HF transceiver project. The design is mostly analogue since the parts I have salvaged came from analogue projects. These parts include a very good quality KVG 9MHz filter, a matched set of MRF454 RF power transistors, purchased from RF parts many years ago, at considerable cost, but never used, and a nice ACI Electronics ACITRON SSB400 case sitting empty in my junk box. The design and construction is what I call retro look. Over the years, I have had several modern "black box" style transceivers, with lots of buttons and functions. Such rigs are also readily available at reasonable prices second hand. So rather than duplicate that style of rig, I chose to use a design similar to transceivers that were common in the later part of the 1970s. The main weakness of those early rigs was the frequency readout and stability. In order to meet modern frequency

and stability requirements, the new rig needed to use a more modern approach, such as a digital VFO.

I must admit I am not a great fan of menu driven rigs. For my use, I really need a rig that basically transmits and receives without the need to drill down menu items in order to increase the RF drive, or change sideband mode, and so on. Hence the minimal use of menu driven functions. And really I only wanted functions that were needed to communicate with other amateurs and not spend most of the time tweaking knobs and pushing tiny buttons.

The rig is designed using the "building blocks" approach. The use of building blocks allows one to test and modify each stage without having to rebuild the whole transceiver if one uses a large PCB. I should say that I don't expect anyone to duplicate this design exactly as presented, but rather

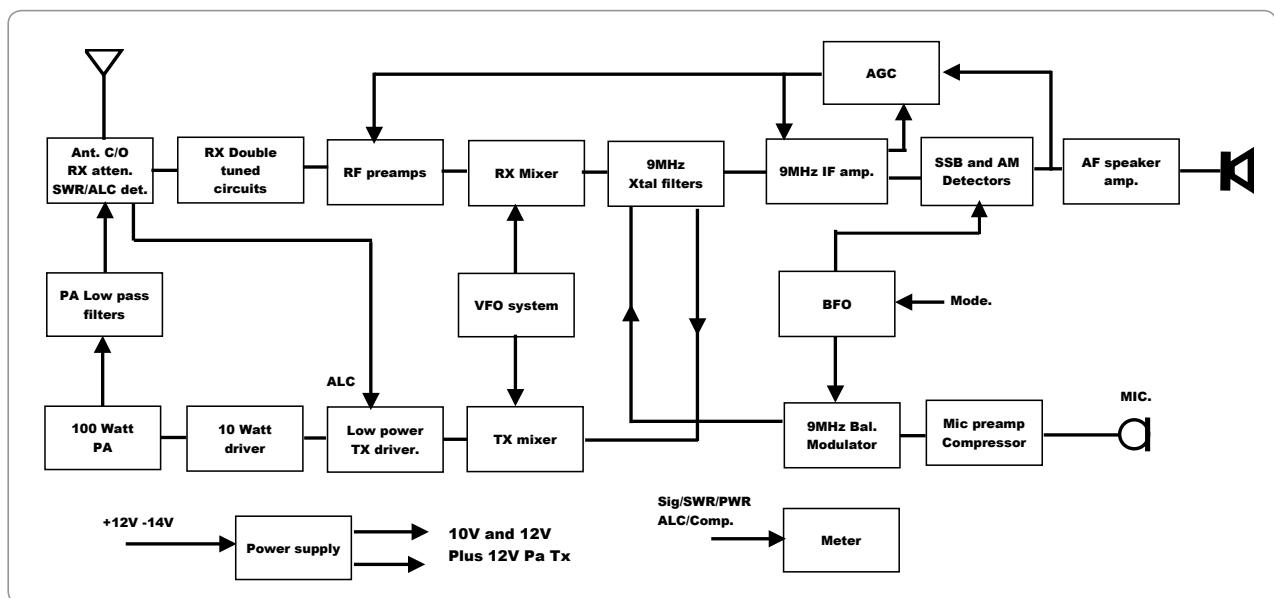


Figure 1: HF Transceiver simplified block diagram.

use the various sections for ideas in one's own creation. To duplicate this design would require one to have a junk box the same as mine, and I don't believe any 2 hams have the same junk box contents!

The finished Transceiver is shown on the front cover of this magazine.

## Circuit descriptions

### Part 1A Block diagram

A simplified block diagram is shown in **Figure 1**. The receiver section tunes from 100kHz to 54MHz. The transmitter section covers the amateur bands from 160 metres to 6 meters. Receiver sensitivity is slightly better than my IC706 upto 30MHz (~0.15uV for 10dB s/n), and a little less sensitive on 6 meters. Output power is limited to 100W up to 10 meters, and 10W at 6 meters. The lower power output on 6 meters is due to the design of the MRF454 power amplifier, which only delivers its full power up to around 30MHz. The MRF454 amplifier can actually produce around 140W but I limit it to 100W. The receiver is a single conversion design with a tuned front end, and a 9MHz IF. The transceiver contains 2 independent VFOs consisting of Si5351 phase locked

loop clock ICs, controlled by a pair of Arduino Mega2560 processors. A simplified block diagram of the VFO system (to be covered in part 3) is shown in **Figure 2**. At this point in time, I have not completed the wiring of the CW mode, nor added the FM module.

### Part 1B Power supply

The power supply circuit is shown in **Figure 3**. The transceiver runs from a 13.6 volt, 20A regulated power supply. A front panel push button operates a small high current relay and applies power to the various regulators and connectors. Input DC is applied to the top of relay 1. The bottom of relay 1 is connected to the front panel on off switch via a Schottky diode. When the on off switch energises relay 1, power is applied to the rest of the power supply via various relays. A red LED over the meter lights up if the polarity is wrong. A green LED lights up if the polarity is correct, and indicates power is available. The power supply is protected with a 20A standard blade fuse fitted with a circuit breaker. The PTT circuit, operated by the microphone button, or the manual transmit switch, allows all the power supply relays to be energised. The PTT circuit is

also routed via the transmit enable relay driven by the VFO logic. This enables transmit inside the allowed operating frequencies. The power supply uses small automotive relays rated at 25A which draw 53mA at a switching speed of 5mS. Although I have used relays in this power supply, I am considering replacing them with P channel power FETs. In a prototype DC switch I have tested, they seem to work very well. **Photo 1B** shows the power supply module circuit board.

### Part 1C Receiver input

Signals picked up by the antenna pass through a switchable 20dB pad, and feed into relay switched bandpass filters. The circuit diagram is shown in **Figure 4**. There are 8 sets of filters covering the frequency range from 100kHz to 54MHz. The filters consist of 2 top coupled parallel resonant circuits tuned by varicap diodes. These diodes are controlled by potentiometers on the front panel. One of the resonant circuits in the pair also contains a trim adjustment, which ensures the 2 tuned circuits track. The frontend tuning is required to cover the range 100kHz to 54MHz in 8 bands. The 8 sets of double tuned circuits are relay switched

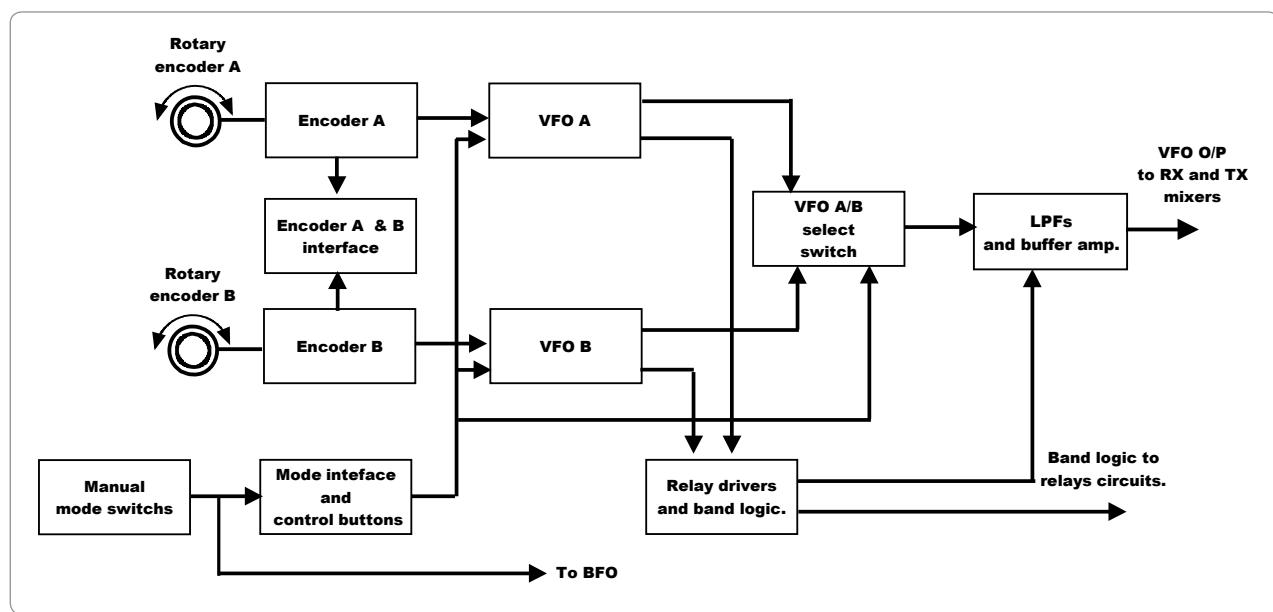


Figure 2: VFO system simplified block diagram.

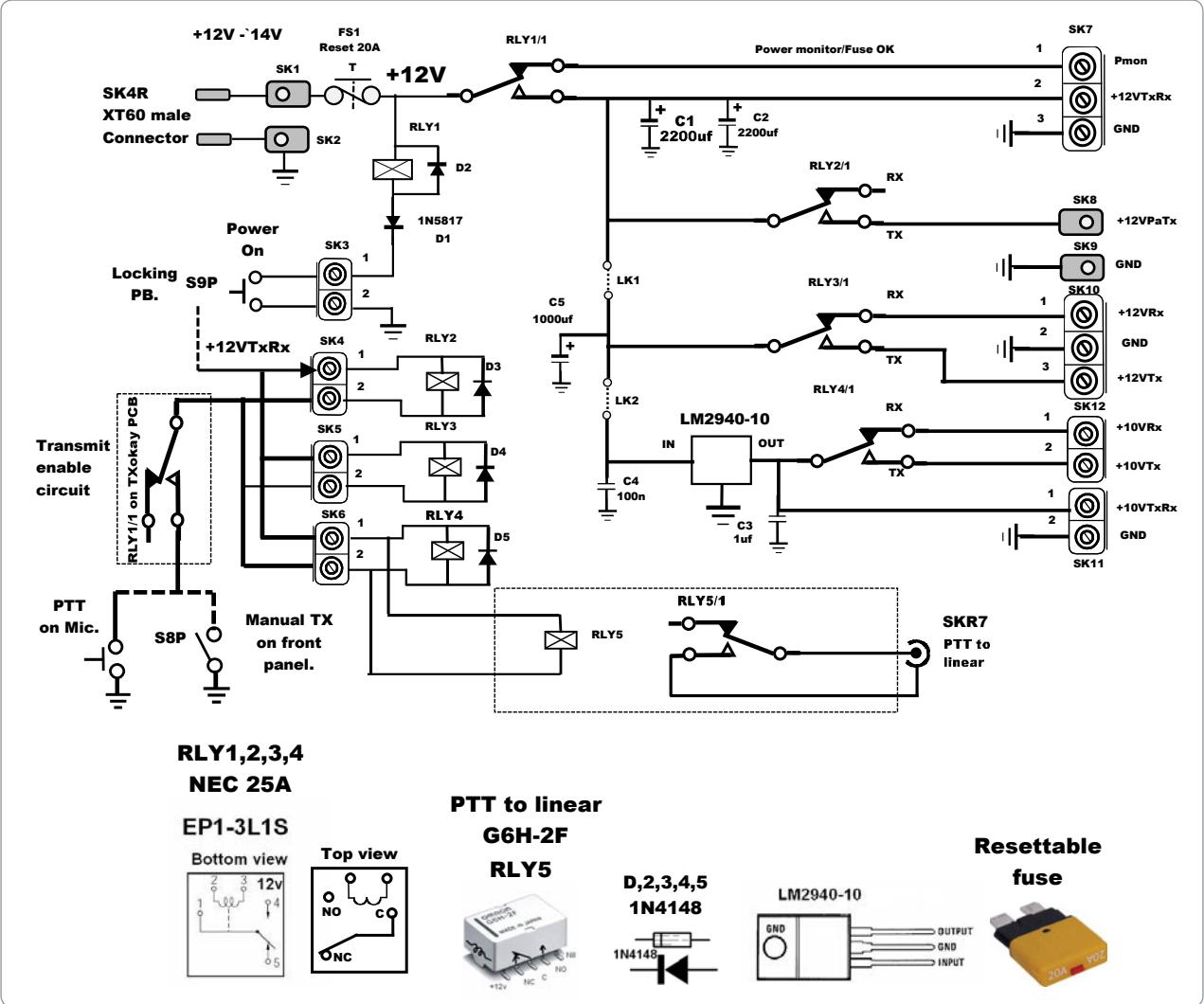
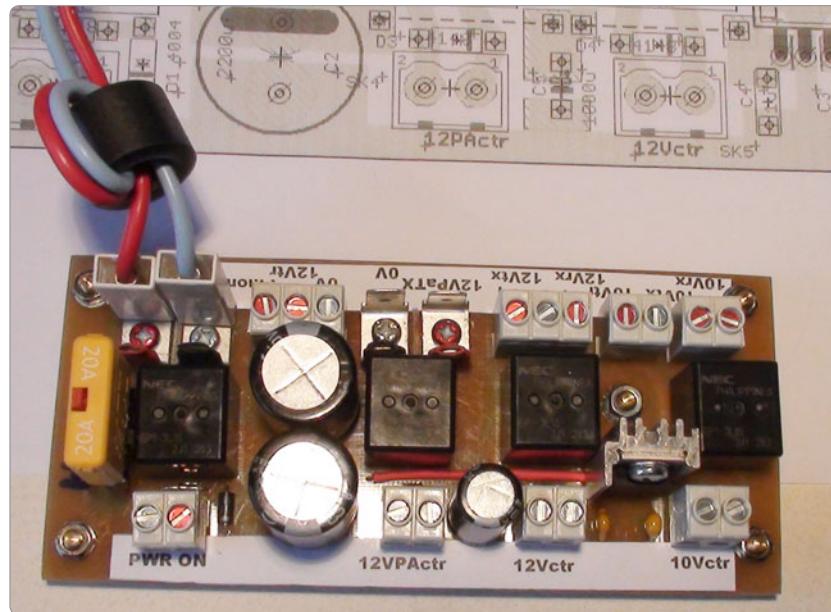


Figure 3: Power Supply.



by the Arduino VFO logic. Separate tune and trim controls are used for each VFO thereby removing the need to readjust the controls when switching between VFOs. The 8 double tuned circuits are mounted on small printed circuit boards which plug into base PCBs. There are 2 base PCBs, each taking 4 filters. **Photo 1C** shows one of the plugin bandpass filters. Note the SMD varicaps mounted on small adapter PCBs. Coil details are shown in **Table 1**.

Photo 1B: Power Supply.

## RF Receiver input tuned filters.

**See RX tuned circuit table for tuned circuit component values.**

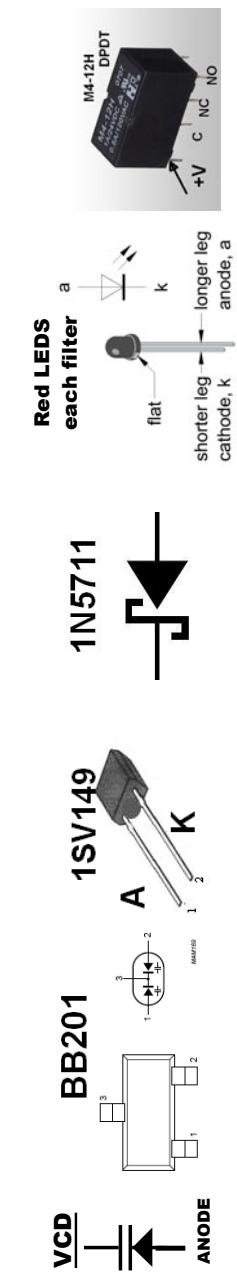
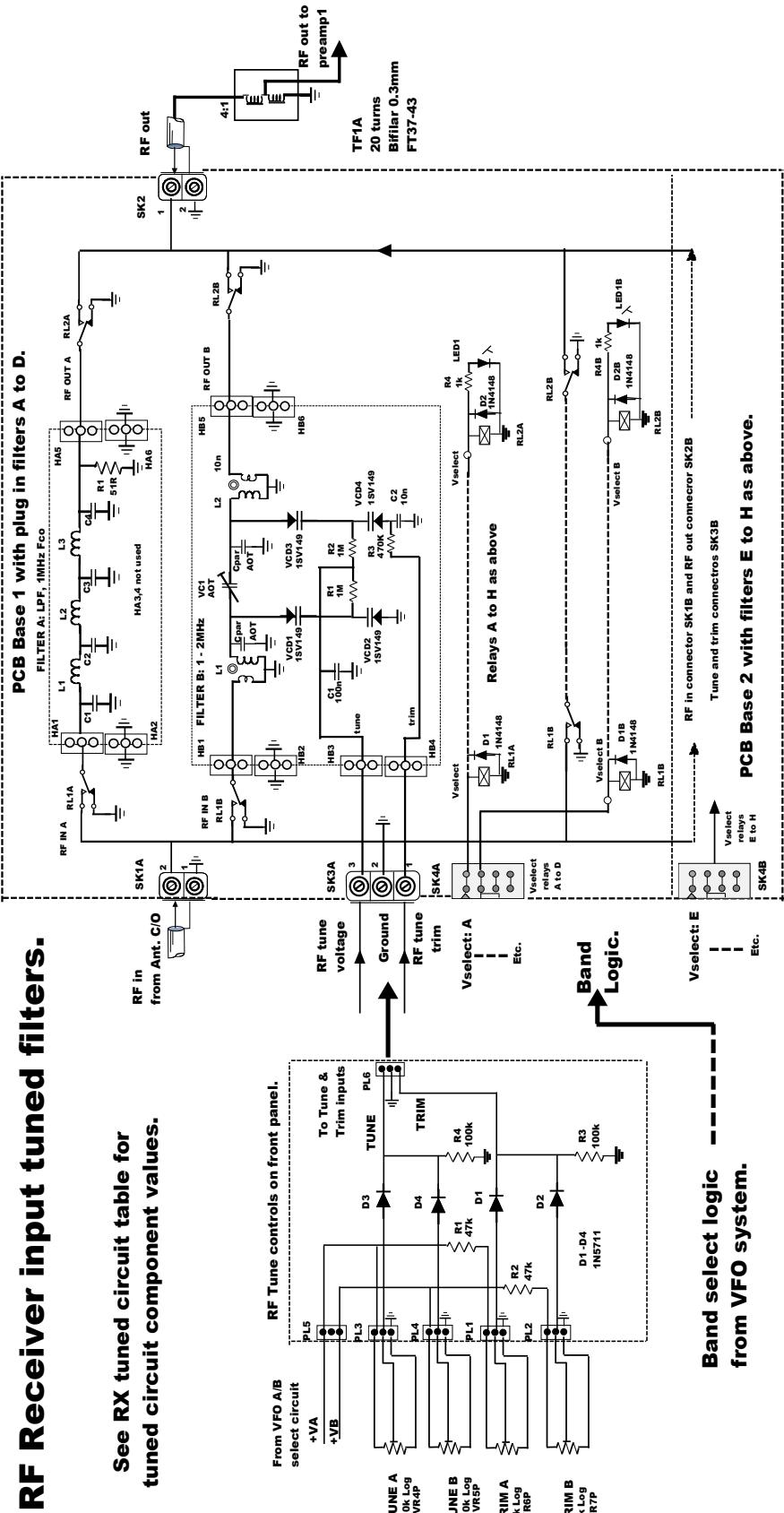


Figure 4: Receiver input tuned filters.

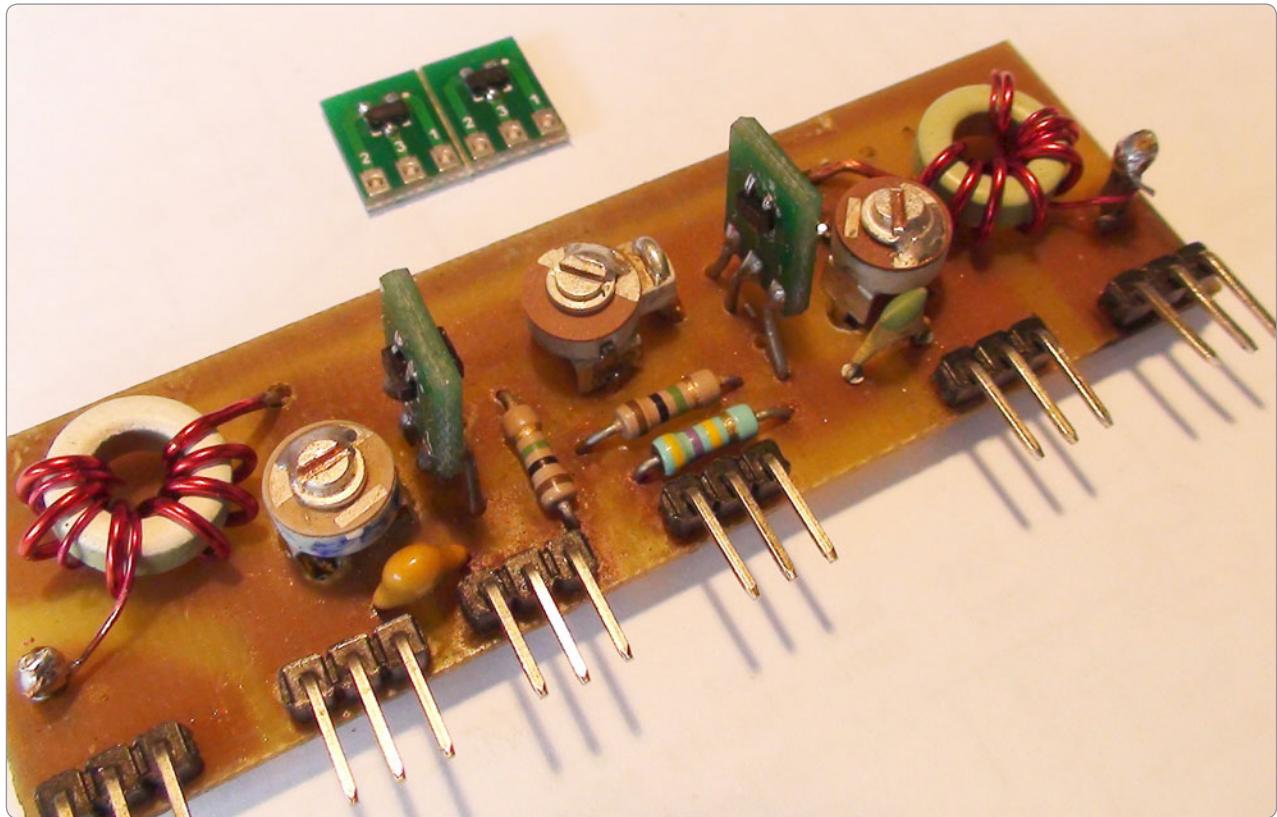


Photo 1C: Example receiver tuned circuits.

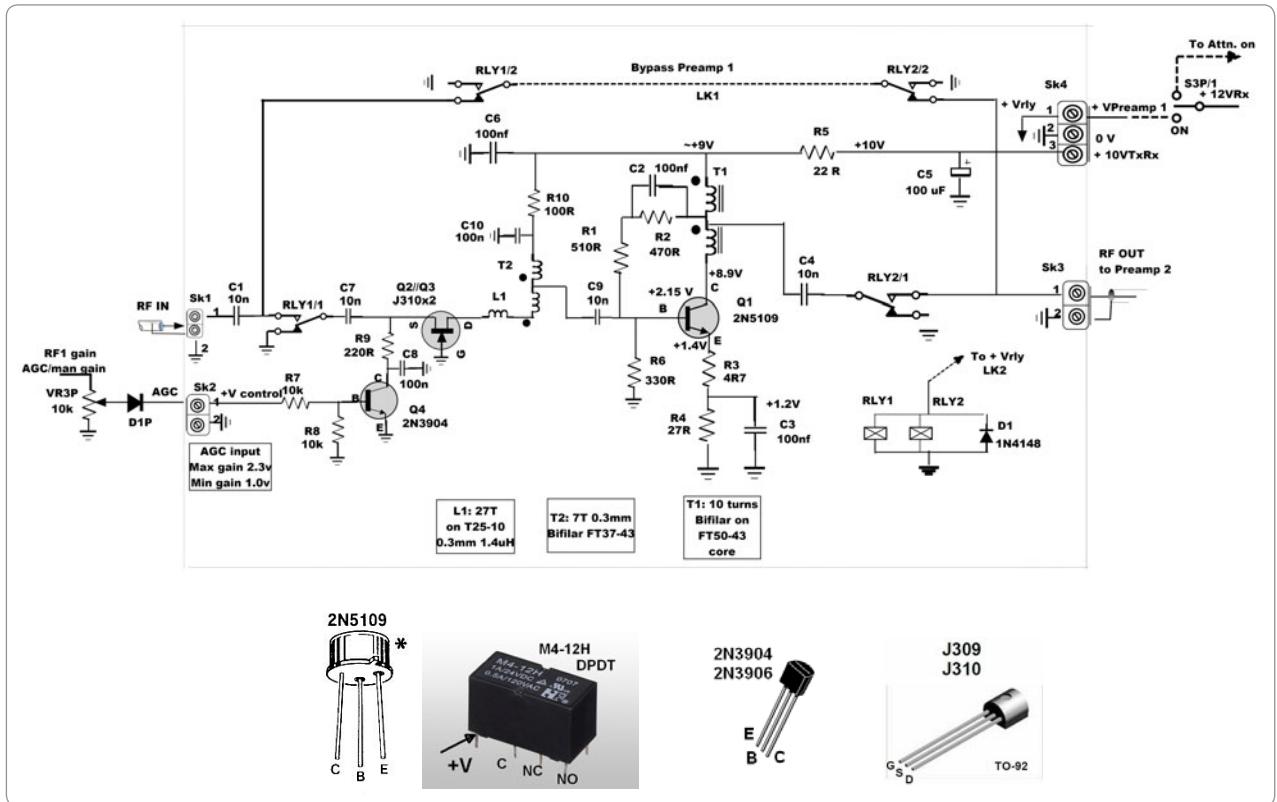


Figure 5: J310x2 and 2N5109 amplifier.

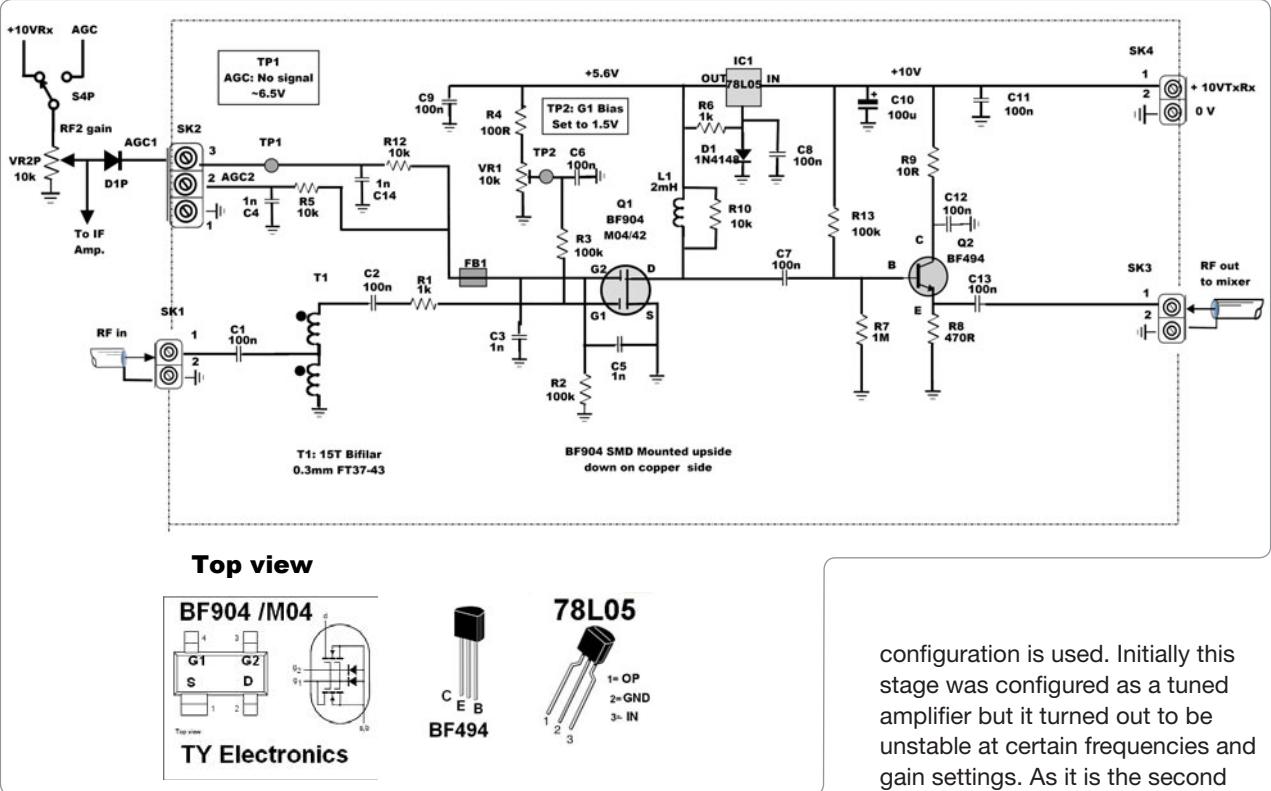


Figure 6: RF BF904 amplifier circuit.

## Part 1D RF preamplifiers

There are 2 RF preamplifiers in this design. The first stage is shown in **Figure 5**, and consists of a robust 2N5109 amplifier with a low noise figure. A parallel pair of J310 FETs in grounded gate configuration are used as a voltage controlled input attenuator. The JFET stage also has a low noise figure, and a forward gain of a few dB. It can also provide 40dB of attenuation. The third order intercept is estimated at around +28dBm. The JFET stage also provides a good match to the input tuned filters. A version of this type of gain control is described in **REF. 1**, and seems to work quite well. The gain of this preamp was measured at +22dB, at 500kHz, and +24dB at 50MHz. A gain reduction of -50dB at 500kHz, and -35dB at 50MHz, was achieved. At 90MHz, it was still producing 15dB of gain. Stability was very good. By using an attenuator at the input of the 2N5109, the 2N5109 collector current does not vary with AGC

thereby maintaining its strong signal handling ability. Small relays are used to bypass this stage using a front panel control. This control is a 3 position toggle switch. The first position switches in a 20 dB resistive pad between the antenna and the double tuned circuits. The middle position switches the pad out, and the third position switches the 2N5109 stage in. So toggling the switch provides -20dB, 0dB, and +20dB of signal variation.

The second preamplifier is shown in **Figure 6**, and consists of a broad band BF904 dual gate FET amplifier. The BF904 is designed to be used in car radios and runs from a 5 volt supply. It has low crossmod under AGC control, and a good high intercept point. It is a partially internally biased device. This allows the source to be connected directly to earth. Gain is controlled by a voltage on gate 2. The gain can be varied by over 45dB and has log linear curve. Its noise figure is quite low. A broadband

configuration is used. Initially this stage was configured as a tuned amplifier but it turned out to be unstable at certain frequencies and gain settings. As it is the second RF preamplifier in the transceiver, it does not really need to raise a lot of gain. Its main usefulness is as a good log linear gain controlled stage ahead of the mixer section. However I measured the gain at +34dB at 100kHz and +23dB at 50MHz. The gain was still high at +14dB at 110MHz. Gain reduction was over 40dB for a 1.5 volt change on gate 2. The response tests were done with input levels ranging from 8mVpp to 25mVpp, and at output levels of 400mVpp. The amplifier is capable of outputting several volts before clipping. In use, you don't really need both amplifiers below 15MHz. Its main function was to provide an amount of AGC controlled gain ahead of the mixer, whilst being able to handle strong signals due to the characteristics of this particular FET. And if using a small inefficient mobile whip, then both these AGC controlled amplifiers can help. On larger antennae or beams, only the BF904 stage is needed, and then really only above 15 Mhz, or if you only have an untuned piece of wire for a receive antenna.

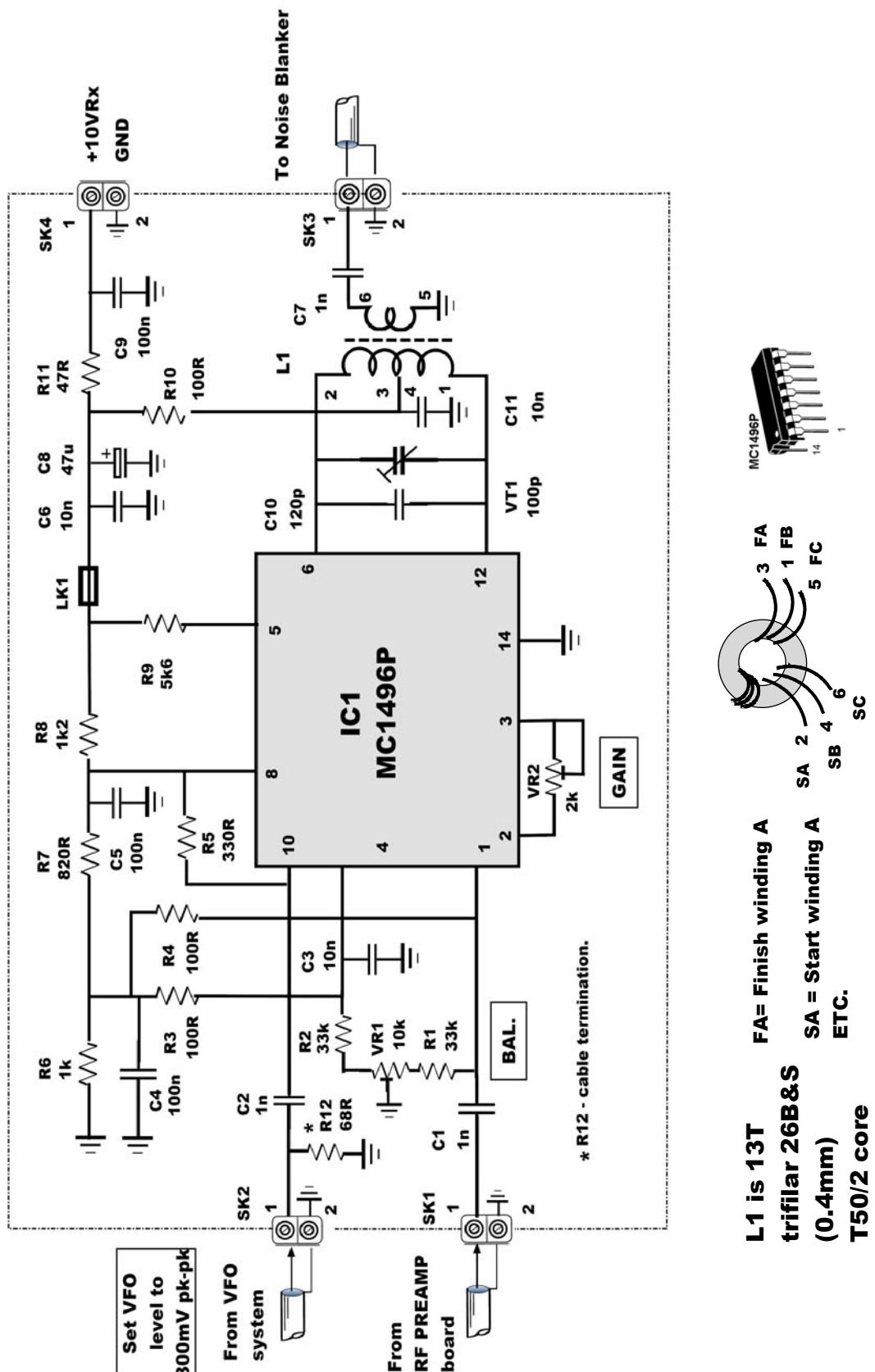


Figure 7: Receiver mixer

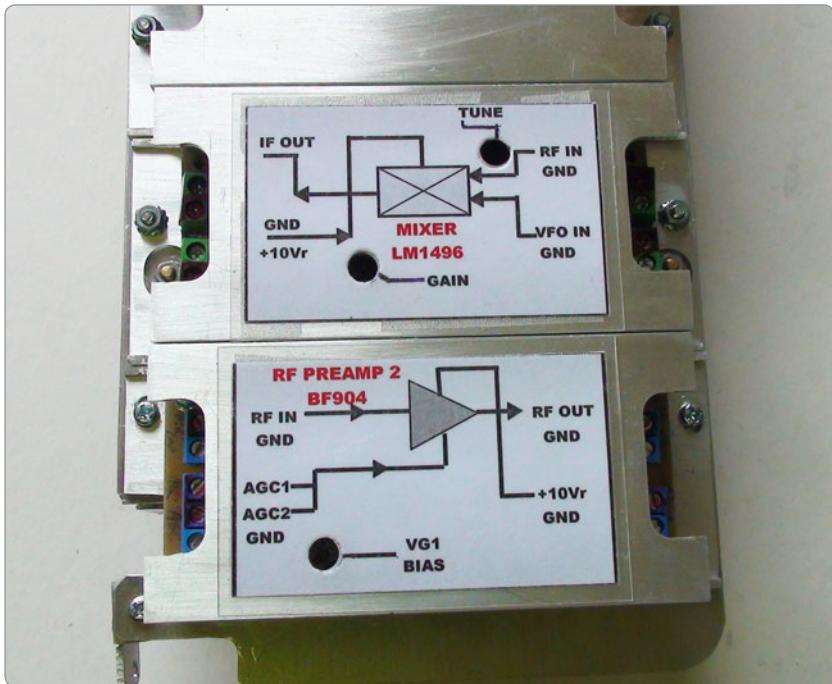


Photo 1E: Receive mixer enclosure.

### Part 1E Receive mixer

The receive mixer circuit is shown in **Figure 7**, and uses an LM1496 or MC1496 IC. This doubly balanced mixer can provide around 13dB of conversion gain. This means lower gain can be used in the following IF stage. The design of this stage is taken from the datasheet. It is not

really a high intercept mixer. However it works quite well. Its signal handling ability can be varied slightly by varying the bias resistor going to pin 5. The gain can also be varied with a trimpot between pins 2 and 3. In this mixer, I run the gain quite low by adjusting this trimpot. According to the data sheet, it has a sensitivity of

7.5uV for 10dB (S+N)/N at 30MHz, with 13dB gain, at a 9 MHz IF. And with an input signal of 20mV, the spurious outputs are better than 50dB down (see **REF 2**). Compared to the more common SA602 mixers, I find it has better signal handling performance, and you can fine tune the balance with the trimpot between pin 4 and pin 1. The receive mixer is mounted inside a shielded box and **Photo 1E** is an example of shielded enclosures prior to cabling.

### Part 1F Noise blanker

The noise blanker is based on a design by Ulrich Rohde (**REF. 3**). See **Figures 8** and **9**. In my version, I used components that were available. The noise blanker amplifies the mixer signal output and produces a blanking pulse for signal levels above the level set by the noise blanker RF amplifier gain control. The blanking pulse is then applied to a balanced diode gating circuit so as to prevent the mixer output containing the noise signal, from reaching the crystal filter stage. In this design, the width of the blanking pulse is determined by the monostable IC timing. The noise blanker is switched in and out of the signal path by a relay. In some designs, the noise

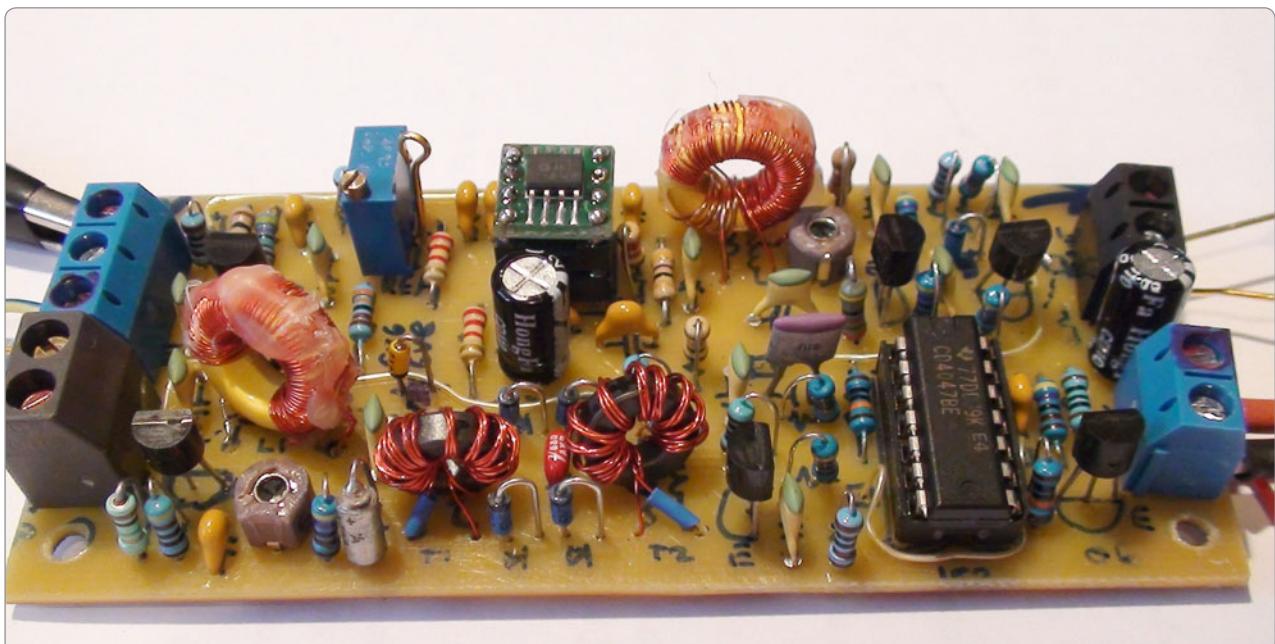
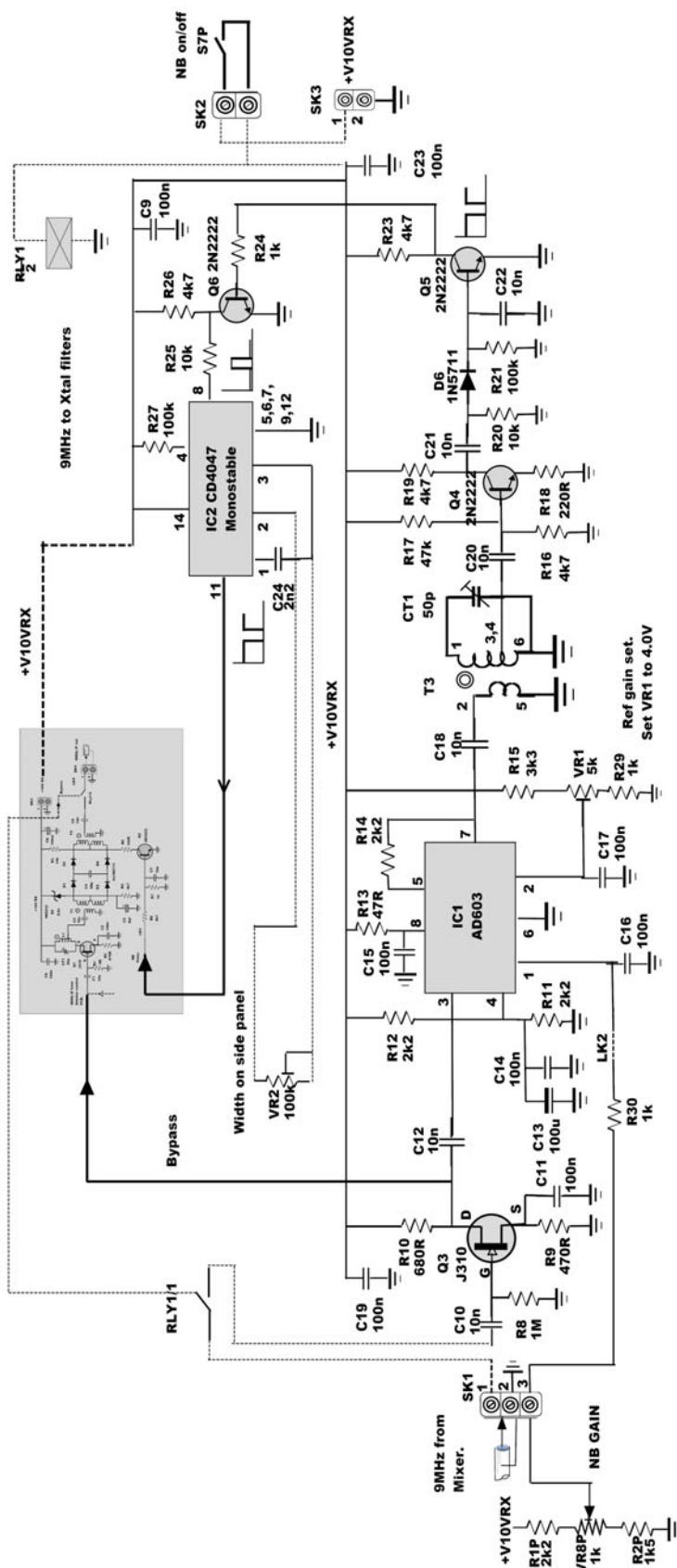


Photo 1F: Noise blanker board.



**T3: 51 Turns on T50-6  
tap 5 Turns, sec. 5 turns**



Figure 8: Noise Blanker Control.

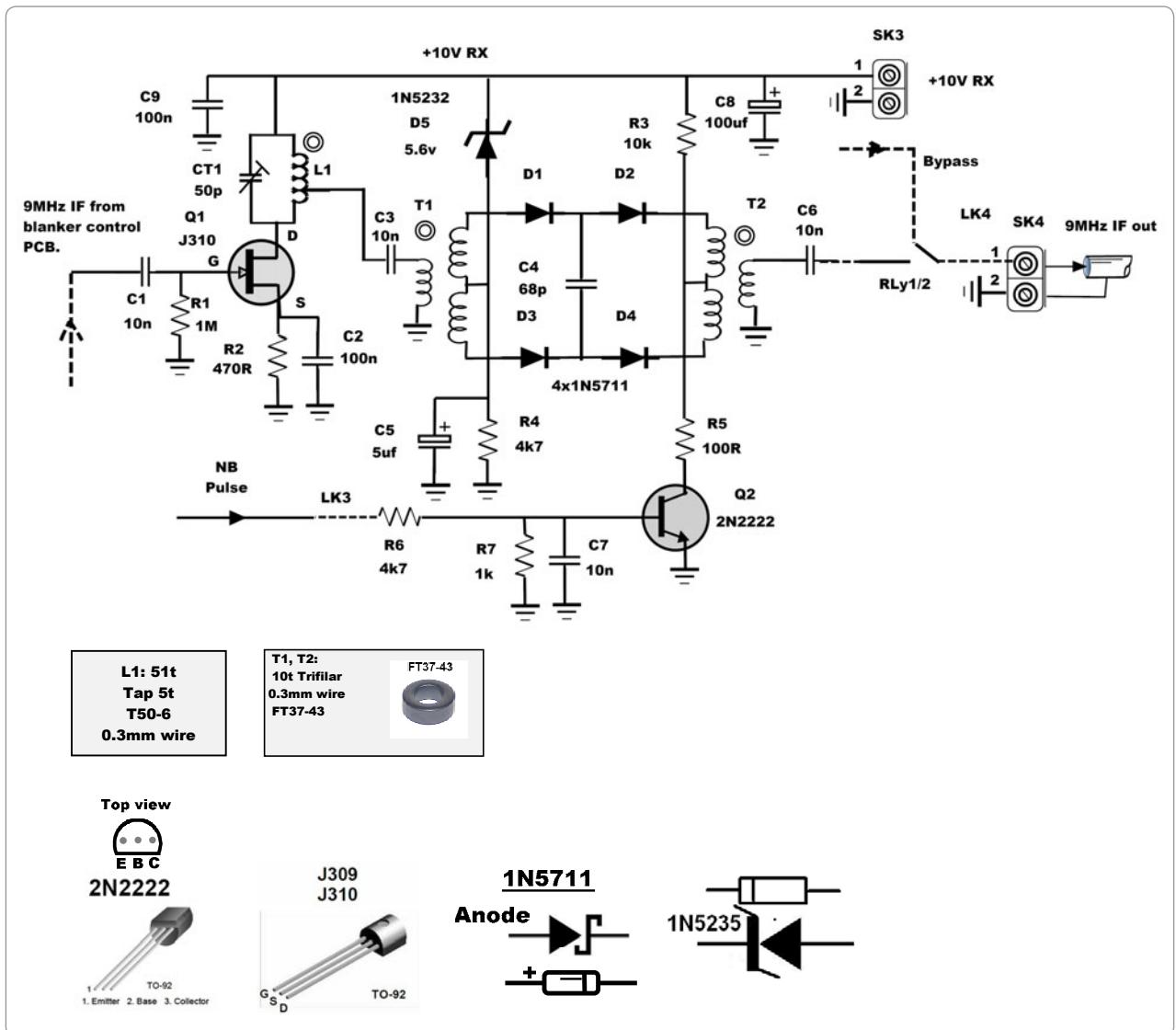


Figure 9: Noise Blanker Gate.

blanker is switched off by turning the diodes in the blanking gate fully on. However I found that the presence of the diodes, although fully switched on, seemed to degrade the performance under strong signal conditions. **Photo 1F** shows the noise blunker circuit board. Note the 2 transformers in the gate section, and the SMD AD603 on a plug in DIL adapter PCB.

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# Magnetic Loop

Joseph Stephen's VK7JS



Photos 1, 2 & 3: Loop showing different mounting arrangements.

As a totally blind amateur radio operator, I find it a challenge throwing a wire up in a tree, so magnetic loop antennas have always fascinated me. The challenge was to design one which was efficient enough to be of use on 80 through 40 meters, but which was also portable.

Being a software engineer for more than 23 years, studying the theory of electronics and antenna theory wasn't difficult, but putting some of that theory into practice is certainly a challenge without sight. I'd like to thank VK5KLT and VK5SFA for answering many of my questions during my research. I'd also like to thank VK5BW who built my first audible SWR meter.

I designed the following two-turn magnetic loop for 80 to 40 meters and have made several good dx contacts using it indoors on 40 meters, and many contacts over 1000 km on 80 meters. I've spoken to the US thrice, to New Zealand and to Vanuatu, as well as to most of VK, just to name a few. I do not get on hf much due to being extremely busy, but the few

times I have, I've made contacts on this loop indoors. I think it will perform dramatically better outside if I ever get the opportunity to try it.

I engaged the services of a

friend who could translate my design into a working prototype. Below is my detailed description for the benefit of other blind hams, as photos are useless to us.



Photo 4: Tuning capacitor housing.

## Goals

- Portable,
- Robust,
- Reasonably efficient from 80-40 meters at 100 watts,
- able to use on 20 meters with a single turn if needed.

## Materials

- approximately 9.5 meters of LDF 5-50 7/8 inch heliax (with corrugated solid copper outer shield) (used for the two-turn 80 through 40 m element), another 4.75 m of LDF 5-50 for an optional single turn element (for use on 40-20 meters).
- 1.2 meters of LMR 400 coax (for the shielded faraday loop),
- two hose clamps which can open to more than 25 mm (to hold the main loop to the tuning box connectors),
- two suitable hose clamps to hold the copper strap to the vacuum variable capacitor,
- Vacuum variable capacitor rated at 5kv with a range of 15 to 250 PF (if you can find one with greater range, your single turn loop should be useable on higher bands also),
- Two pieces of 25 mm copper pipe each about 11 cm long (used to attach main loop to variable capacitor),
- right angle brackets to hold pipe to tuning box,
- about 2 meters of square wooden pole for upright,
- metal brackets to hold upright to tuning box,
- scrap ply wood for loop support at top of upright,
- scrap ply wood for tuning box,
- large diameter rubber radiator hose to cover exposed copper,
- Velcro or other straps to hold faraday loop to main loop,
- SO239 tee piece,
- bracket to hold tuning box to tripod or stand,
- bolts and wing nuts for easy assembly.

Note: While it is preferable to place the vacuum variable capacitor at



Photo 5: Coax to tube connection.

the top of the loop, farthest from ground, in a portable configuration where the loop is manually tuned, it is more convenient to place the vacuum variable capacitor at the bottom of the loop. So long as the loop is situated such that the vacuum variable capacitor is at least one loop height above ground, I've found this to be an acceptable compromise.

## Main Loop description

The main loop is a length of about 9.5 meters of LDF 5-50 7/8 inch heliax which has a solid corrugated copper outer shield (not braid). The shield is used as the radiator, the inner core is ignored. The LDF 5-50 is formed into a two turn loop. The loop diameters are approximately 1.5 meters.

The first turn attaches to the right side of the tuning box toward the front, goes anticlockwise, up and over the top of the upright bracket on top of the upright pole, and down, crossing over just on top of the tuning box, touching the tuning box in the middle of the top surface, then goes anticlockwise again, up and over and comes down and attaches to the left side toward the back of the tuning box. There is about a four inch gap between the two loops (except where it crosses the top of the tuning box to start

the second turn). Thus, at the top of the upright, if looking downward, you'd see two parallel loops. The inner conductor of the main loop is completely ignored.

The insulation of the LDF 5-50 is cut back about 5 cm from each end. The shield then snuggly fits into 25 mm copper pipe which protrudes from each side of the tuning box, and is held in place using hose clamps.

Note: Because the LDF 5-50 is insulated, a gamma match is not an option unless you pierce the insulation. I did not want to do this for safety, since the main element is carrying very high voltages at 100 watts, so I opted for the Faraday feed method.

The faraday loop is made of a 1.2 meter length of lmr400 and a tee piece which has three so239 sockets on it. There is a pl259 on each end of the lmr400 which screw into each side of the tee piece, and then the feedline pl259 screws into the bottom of the tee piece.

In order to wire this correctly, you need to have the signal from the inner core of the feed line travel around the outer shield of the lmr 400 and back down the shield of the feedline. In order to accomplish this, you need to solder the lmr400 to the two pl259s which screw into the tee piece in an unconventional way.

In order to use the shield of the lmr400, you need to connect the shield at one end of the lmr400 to the shield of one of the pl259s, and at the other end of the lmr400, you need to connect the shield of the lmr400 to the inner conductor of the pl259.

This allows the signal from your feedline, which travels on the inner core of the feedline, to go through the tee piece, run around the shield of the lmr400, then back down the shield of the feedline.

There are two possible configurations for faraday loop placement.

1. The faraday loop hangs down between the two turns of the main loops, but is just behind the front loop, the top of the faraday loop hard up against the top of the front loop. In this configuration, because it is two-turns and not a single turn, the loop is theoretically unbalanced.
2. I have found that I can equally position the faraday loop exactly half way around the main two turn element, where it crosses over the top of the tuning box, held to the element with Velcro straps. In this configuration, the loop is theoretically perfectly balanced.

I've had no noticeable difference in performance with the faraday loop at either position. I favor the bottom position due to its ease of installation when the loop is on a tripod, and have been able to get an SWR of 1.0 on 80 and 40 meters. This seems unconventional, the faraday loop and capacitor both being at the bottom of the loop but, the housing of the vacuum variable capacitor is quite thick, and the element is also insulated. Remember, this is a two turn loop so the exact halfway point on the main element is where it crosses over the top of the tuning box on its way to making its second turn, not opposite the vacuum variable capacitor.

The faraday loop is quite stiff, being made out of lmr400. It holds

its shape well even with the rg58 feedline hanging from it (assuming the faraday loop is at the top). The tee piece to which the feedline attaches is of course at the bottom of the faraday loop. That tee piece also helps hold the shape of the faraday loop a bit.

If I position the faraday loop at the bottom, at the exact midpoint of the two turns, the tee piece sits on the main element and the feedline enters from the right rear, where there is no element. The tee piece in this position helps hold the faraday loop in its upright position, held in place by Velcro straps.

Most people say that flattening the faraday loop slightly helps with bringing down the SWR. I haven't actually tried keeping it round. I figured that if I could tune the loop with good SWR, I wasn't going to mess with it any more. It's only slightly flattened, elongated so that the height of the faraday loop is about two thirds of the width.

Note that you may need to adjust the length of your faraday loop. Generally it should be slightly larger than 1/5 of the circumference of one of the turns.

The upright pole is attached to the back of the tuning box using metal brackets, bolts and wing nuts.

The bracket at the top of the upright has three cutouts, one for the first turn, one for the second turn, and a smaller cutout just behind the one for the first turn, for the faraday loop which sits hard up against the first turn and hangs down below the bracket between the two turns (if in the top position).

The bracket supporting the two loops protrudes over the tuning box (about 1.5 m above the box).

The upright pole is cut in half for portability and has a sheath on one half so the two pieces fit together when the upright is attached to the tuning box.

### Tuning Box

The tuning box is 21 cm x 21 cm x 17 cm (w x d x h), made of 14 mm plywood as that was what was on hand.

The vacuum variable capacitor is mounted inside so that the shaft protrudes through the front of the box.

A hole is drilled on each side of the box, on the right toward the front and on the left toward the back. The holes are offset because the loop is two turns rather than a single turn. If it were a single turn, the holes could be at the same location on each side of the box.

On each side, a piece of 25 mm copper pipe is inserted into the hole. The pipe extends out each side by about 70 mm. Each piece is held in place by right angle metal brackets attached to the outside of the tuning box.

30 mm copper strap is used to attach the vacuum variable capacitor to the copper pipe on the inside of the box on each side using hose clamps.

A horizontal slit is cut into the end of the protruding pipes about 3 cm to make it easier to push the ends of the main loop into the pipes and to facilitate clamping the pipes to the exposed corrugated shield of the LDF 5-50.

The key is to form as low a loss connections as possible! The stripped LDF 5-50 pushed about 50 mm into the copper pipe and held in place with hose clamps makes a good low loss mechanical connection.

Before fitting the ends of the LDF 5-50 into the protruding copper connectors, I slide a piece of large diameter rubber hose on each end of the LDF 5-50 which can then be slid back over the hose clamps to ensure that no conductive surface is exposed for safety.

A large wooden knob (about 12cm) is used to tune the capacitor.

At resonance, the 1.5 SWR bandwidth on 40 m is about 30 KHz and on 80 m, it is about 10 KHz. These are only estimates.

Attached are some pictures for you sighted hams, taken by my XYL who is not a ham.

Happy experimenting.



# A high performance, lightweight 2 m antenna using materials from your local hardware store

Grant Symons VK3ZTE

## Introduction

A high performance 2m antenna that can be built using readily available materials and basic tools is described. First up, I must acknowledge that the fundamental ideas that underpin the design are not original. The design combines a clever matching arrangement described by the late Gordon McDonald VK3EJ with the skeleton slot feed system regularly published by the RSGB over the last 50 or so years. The resulting antenna involves a compact, lightweight structure comprising 4 six element



Photo 1: Array on tower.

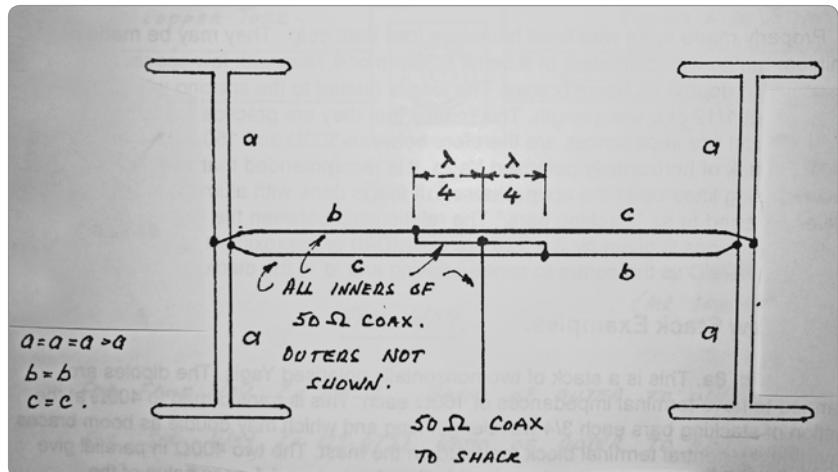


Photo 2: Aerial matching arrangement.

Yagis that occupy a volume roughly 2.1m long by 2.5m wide by 1.2m high. As built and without adjustment, the antenna returns VSWRs of better than 1.4:1 between at least 144 MHz and 145 MHz.

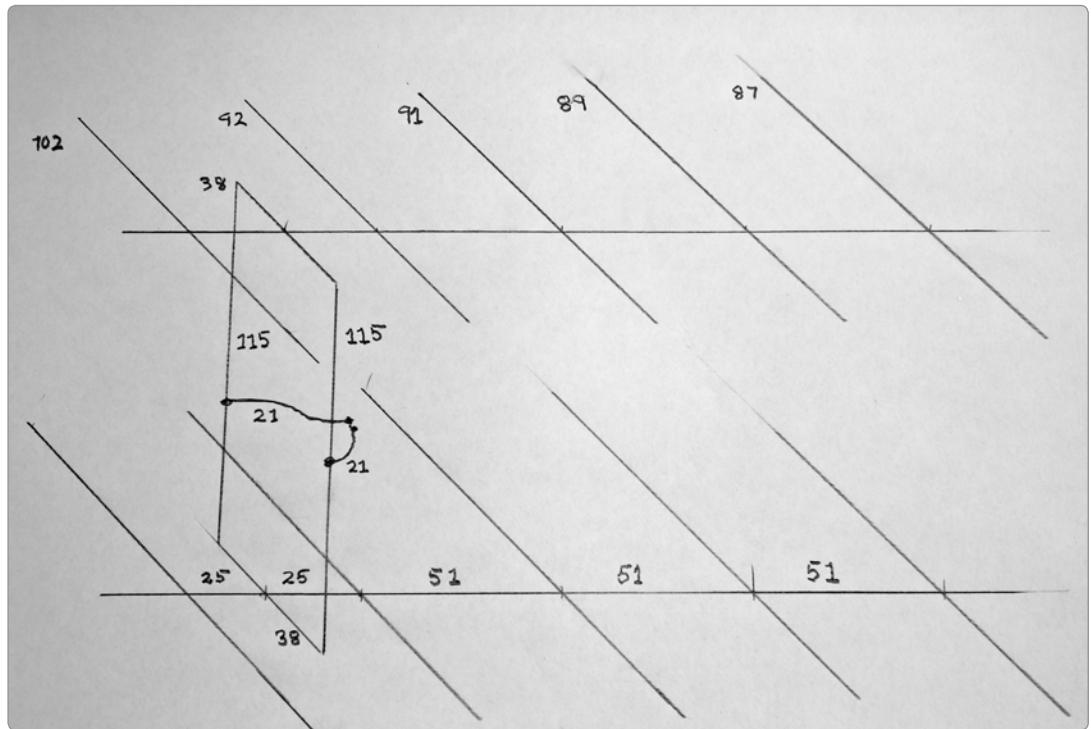
## Configuration

The stacking bars and folded dipoles depicted in Gordon McDonald's diagram <http://www.grantronics.com.au/docs/StkYagis.pdf> below are replaced with skeleton slots and delta matching sections as per RSGB designs presented through the ages. The RSGB matching sections of about 292mm are designed to transform down to 72 ohms and scaling these for 100 ohms as required here, results in delta matching sections of about 210mm each.

## Theory

Gordon McDonald's approach to feeding the driven elements achieving both impedance matching and balance to unbalance conversion is elegant and appealing.

So how does it work with the skeleton slot feed system? Well briefly, the delta sections transform the high impedance at the mid-points of each skeleton slot down to 100 ohms balanced and basically resistive. Each of these feed points is presented with 100 ohms and cross-connected to its opposite number by the inners of parallel, equal lengths of 50 ohm RG213. The phasing is such, that the two outside legs of the skeleton slots are connected together and so with the inner legs. The outer shields of the co-ax are merely connected together at the ends. The 50 ohm feedline is connected to the parallel cross-connecting lines via power dividing quarter wavelength sections, each attached at 25 ohm points a quarter wavelength out from the centre. Each quarter wavelength section of 50 ohm coax transforms the 25 ohm impedance at their terminating points on the cross connects, to 100 ohms at the tee. Being in parallel, they present 50 ohms unbalanced to the main feeder. For a further description, I



*Photo 3: Physical dimensions in centimetres.*

would recommend reference to one of Gordon McDonald's excellent papers on the subjects of stacking, phasing and matching.

## Construction

Following previous difficulties with in achieving element alignment on circular booms, 25mm square section aluminium was chosen for the booms and this together with a small, cheap drill press, greatly simplified the business of getting everything nice and square. The vertical spacers supporting the booms are of 25mm aluminium tube and the elements, skeleton slots and delta matching sections are all cut from 10mm aluminium tube. Element lengths and spacings are as per the accompanying diagram. A length of 40mm pressure pipe reinforced with a 40mm hardwood dowel down the middle was used for the cross member between the two bays and same for the central vertical mast section but without the need for the dowel since the mast section is mostly in compression. Regular plumbing

fittings (T and reducing pieces) were used in conjunction with plumbers cement to hold everything together. Horizontal spacing between the booms in each bay is approximately 1.5m. This was found to provide a nice clean pattern, but for more background including the option of trading off pattern for gain, I would again refer the reader to Gordon McDonalds writings.

All co-axial matching sections were made up from 50 ohm RG213. One aim was to avoid any superfluous horizontal conducting material - that is parallel to the E field. With the exception of the RG213 co-axial matching sections, this was largely achieved. The topology of the matching harness requires a significant number of cable connections and accurately cut cable lengths. To avoid a lot of nasty impedance discontinuities at the connection points, and minimise opportunities for moisture ingress, it was decided to make up all of the matching sections on the bench and terminate them with decent quality N type connectors. The skeleton

to keep the water out and haven't gone the additional step of sealing everything up with silicon sealant at this stage. I am prepared to see how that goes.

When cutting the co-ax for the matching harness, the velocity factor of the RG213 must be accounted for. The books indicate 0.66 for RG213 and given that a quarter wavelength in free space at 144.5 MHz is about 2076mm, a quarter wavelength of RG213 is 343mm. All 6 lengths of RG213 were terminated with Type N connectors, and the lengths of internal parts of the connectors and adaptors had to be factored in when cutting and terminating each length of co-ax.

## Conclusion

A relatively compact and simple high performance 2m antenna is described. Its construction is non-critical and it should yield a gain of around 15dBd. Any enquiries about further details are welcome and I can be contacted at [grant.symons@optusnet.com.au](mailto:grant.symons@optusnet.com.au)



# A coax cable magnetic loop and tuner for 1.8 and 3.5 MHz

Peter Parker VK3YE



Photo 1: Magnetic loop in use (with 15m RG58 as radiating element).

Current solar conditions mean that 7 MHz can be patchy for short and medium distance communication. Even during the day 3.5 MHz can do better, especially if you're portable in an RF quiet area. There are even nights when 1.8 MHz is required for closer in contacts.

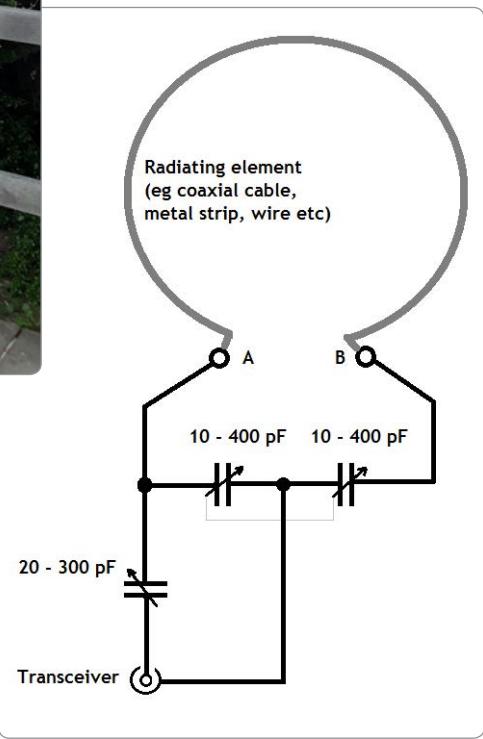
The only problem is that antennas for these lower bands can be quite long. You might not have the multiple rigid and high supports sometimes needed. Or you might be in a townhouse with only a small courtyard that

can't accommodate a full sized antenna.

Here's one idea for a portable, temporary or limited space antenna for the lower HF bands. It comprises a metal loop and tuning box to bring it to resonance. The loop could be copper tubing, aluminium strip or a length of RG58 or RG213 coaxial cable. You don't need to do anything to the cable so you can keep it for other purposes later on. In a pinch you could even just use wire, though expect higher resistive losses and lower antenna efficiency.

This magnetic loop is different from most others you see. These normally have a small coupling loop or gamma match-type arrangement to couple the signal from the transceiver to the antenna.

Figure 1: Circuit.





*Photo 2: Magnetic loop tuner front.*

Instead this unit just uses a coupling box and two variable capacitors to do all the work. The advantage is that you can attach various types of loops for different bands. And, as noted before, you can even use an unmodified coaxial extension cable as the radiating element.

Nothing presented here is new. It is similar in concept to the 'Army Loop' of the 1960s, though the matching network is different. MFJ make several 'loop tuners'. I got the idea for this one from the designs documented by PD7MAA and G8ODE.

This loop will have some losses. The coaxial cable radiator will have more resistance than something more solid than thick copper or aluminium tubing. However these are far less portable and can't be rolled up like this one. If you're making SOTA to SOTA contacts the noise level is normally low enough to still hear weaker signals such as from loops like these. Also you might be able to offset some losses with a longer radiating element with a larger capture area.

Magnetic loops are basically giant radiating tuned circuits. If you change the frequency you must adjust the variable capacitors for

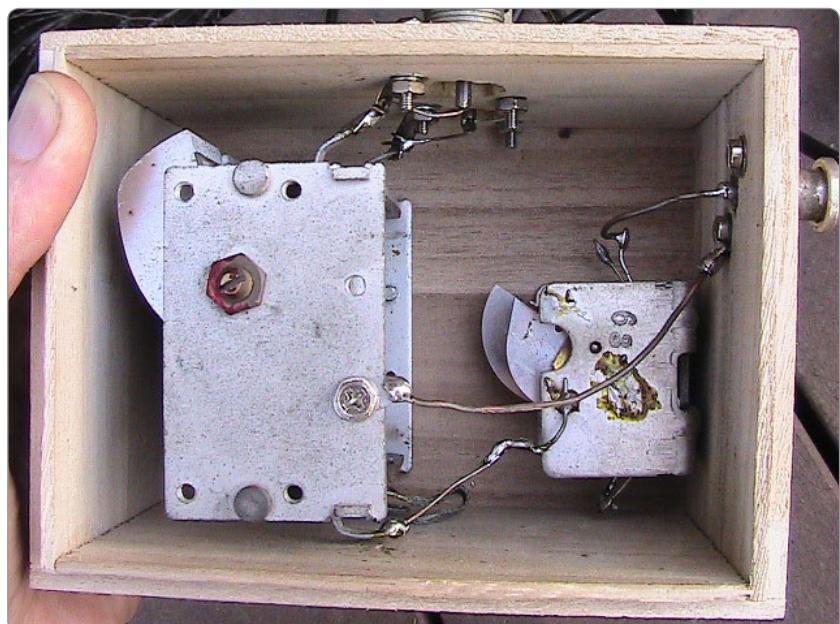
the loop to resonate and effective coupling of RF energy to and from the transceiver. A longer element lowers the frequency that the loop can tune to and vice versa. For example the 15 metres of RG58 coax cable I use allows resonance from about 1.3 to above 4 MHz, in other words the 160 and 80 metre amateur bands. A shorter length should allow operation on higher bands like 7 and 10 MHz if desired.

## Components and construction

Build the unit in a plastic or wood box not much bigger than required to house the parts. Garage sales and second hand shops often have suitable containers for two dollars or less. A metal case should not be used unless you can insulate connections from the loop and one of the variable capacitors from it.

Figure One is the circuit. There are just two main components. Both are variable capacitors such as from old valve radios. These often come up at hamfests. The capacitor across the loop must be a dual gang type with each section being equal.

The stators (fixed plates) are connected across the wire loop. Because I wanted to use coaxial cable with PL259s I used SO239s with the inner and outer connections shorted. These are mounted as close as possible to the stator connections on the variable capacitor (Photo Four). If you prefer metal strip as your element you could use alternative methods such as bolts and wingnuts. There is no reason why you can't have both to make your tuner more versatile. The frame of this variable capacitor (ie



*Photo 3: magnetic loop tuner inside.*

the moving plates) connects to the transceiver antenna socket's outer ring.

The capacitor connecting to the transceiver antenna socket can be a dual gang but doesn't have to be. If it's a smaller type (like I used) you can connect both sections to increase the maximum capacitance. The values are not especially critical though they will affect the bands you can cover with a given element length.

Variable capacitors with 6.3 mm (1/4 inch) shafts are easiest to use as knobs are readily available. If you have 9.5 mm shaft capacitors you can use irrigation T-pieces as knobs. On my unit they are a firm fit even without glue or tape.

### Adjustment and use

Set the loop up so that as large as possible area is enclosed by it (eg a circle or diamond). Switch on the receiver and adjust both variable capacitors for maximum noise. You will probably notice interaction between the two controls. Apply a small amount of power and adjust for lowest VSWR (ideally 1:1). Receive noise should still be high. Like with all magnetic loops the tuning will likely be narrow and there will be high voltages across the variable capacitors so exercise appropriate caution when using. Readjust each time you change frequency as bandwidth will be quite narrow.

### Results and improvements

I've had good results on both 80 and 160 metres SSB with this loop

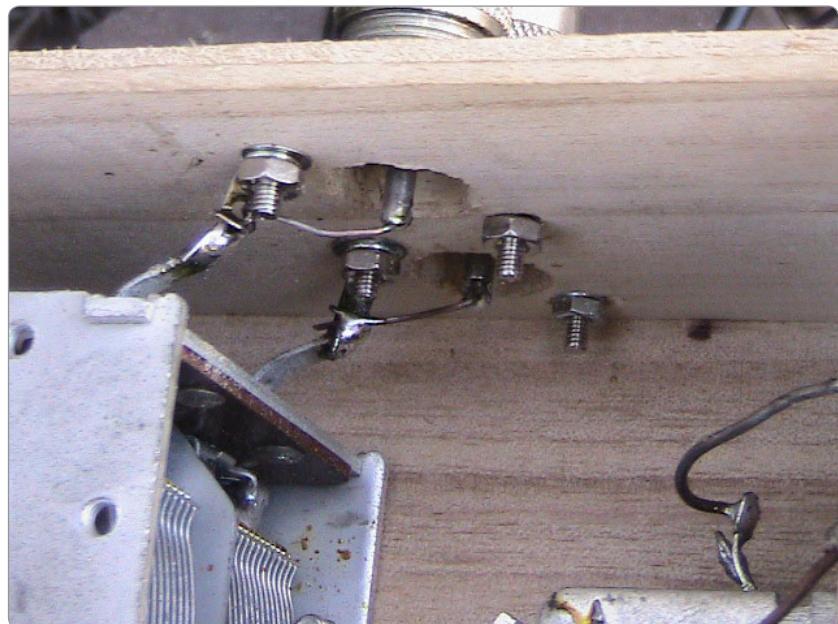


Photo 4: Magnetic loop tuner connections.

while operating portable. I was using 15 metres of RG58 coaxial cable formed into a diamond shape with a squid pole mast. Expect solid 3.5 MHz contacts up to several hundred kilometres even with low power. 1.8 MHz won't be as good as the antenna is less efficient there. However there are still occasions for distances in the 30 to 200 km range where 1.8 MHz is superior so having this capability is worthwhile.

What other things could you do with this antenna? You could take several leads of various lengths to allow coverage of higher frequency bands. Another approach, not yet tried, is to make the tuner a dual function loop tuner/pi-network antenna coupler for an end-fed wire. This might be possible by adding an

inductor and some switching with a double pole double throw switch. Disconnecting one side could allow the coaxial cable loop element to form the radiating wire in this configuration as well. I'll leave the exact connections as a puzzle for you to solve.

### Summary

Even if you don't consider yourself a magnetic loop person, a tuner like this is a worthwhile project. It can quickly turn a roll of coax into a useful antenna for the lower HF bands. While it doesn't deliver the ultimate in performance the compact size and short set up time makes it ideal for portable and short-term operating.

[vk3ye.com](http://vk3ye.com)



## John Moyle Memorial Field Day 2019

This year's entries came from every Australian call areas (except VK0 and VK9) with several from New Zealand. Well done to all who took part and made an effort to submit their logs.

To view all results please visit <http://www.wia.org.au/members/armag/2019/november/>

# A Top Band helical vertical for confined spaces

Dr David 'Doc' Wescombe-Down VK5BUG

## Introduction

Perhaps you have an unsatisfied interest in Top Band (aka 160m, 1.8MHz) but feel starved for aerial space? What if there was a relatively easy DIY project by which you could make your own helical monopole based on 75mm PVC pipe and some recycled household or mains extension cord wires?

For many years I was fortunate enough to have quite large Inverted-L aerials

Inverted-L aerials for low band working (Wescombe-Down, 2015, 2016). For health reasons however, downsizing which included hobby culling was forced upon us, embracing my extensive LF-MF amateur station. Aerials were dismantled, bulky homebrew and ex-marine radio equipment disposed of, all to find life with various other VK amateurs. Tears were almost shed!!

Much thinking, planning and discussion went into how I might be able to create a more compact operation for Top Band at least, sacrificing Five Ton (600-630m) which had been my favourite band as a ship and shore station professional telegraphist since 1964. My quest was to develop a low-profile vertical aerial to be easily mounted on my 10m long workshop metal shed roof as a ground-plane. One caveat to my experiment was to allow one informed other person (an amateur) to assist me with the rooftop installation and tuning, primarily for safety reasons. This new adventure after 50+ years on air was to be a cathartic project of

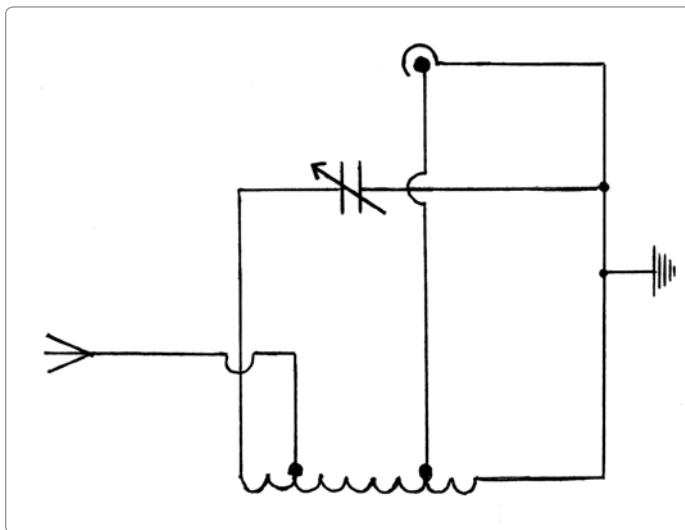


Figure 1: L-C Circuit.

what *I could do*, rather than what *I could not*.

Thus, a compact helical monopole became my 'chemotherapy therapy' initiative for 2017, most of which would be occupied by multi-mode cancer treatment. My initial challenge was to construct a mental mindset including the 'washing away' of any aerial performance expectations of what I saw to be a compromise MF aerial after what I had been used to for so long. At the same time, I needed to construct confidence in being able to retrieve enjoyable Top Band operation using AM and CW: my two modes of choice. Working DX is not easy from a land-based VK5 station on Top Band, and I needed to view **any 160m QSO** as qualifying for the true meaning of 'DX': distance!

## Generic design considerations

My next step was to research a range of aerial design options based on my new mindset, and I share the following background and technical

information gleaned that I found to be very useful for this phase of the project. Vertical aerials are typically mounted perpendicular to their supporting surface and this helical was to be no different. There were some important points to keep in mind during the planning stage, including:

- The space occupied
- Earth dependency
- Radial wire diameter
- Earthing rods
- Location of radials: above, on or under the earth

Leigh VK5KLT endorsed my thoughts on the proposed design of a continuously-loaded vertical configuration being the preferred way to go for a relatively compact footprint, low band aerial, certainly superior to any lumped inductance (base, centre or top loading) structure due to the resultant voltage and current distribution on the helical wire radiator element being desirably more linear than with other vertical monopole designs. Note monopoles do not have to be vertical radiators: they may be, but the term 'monopole' embraces other configurations as well.

## Occupied space

There are those, including more than one commercial aerial manufacturer, who would have us accept that vertical aerials are 'space savers', not requiring any earthing system. Such a claim may have some merit for the vertical radiator portion in some circumstances but is open for debate when ground dependency necessitates having an 'RF earth mat', particularly for the low bands

(40m and below). Unless installed over salt water, an effective earth system for a short MF vertical (say, less than 7/16 wavelength) is likely to occupy more space than a G5RV, EDZ, beam, quad or dipole footprint at the same frequency.

Radials serve to collect return currents from their vertical radiators, for which the earth quality up to half a wave from the aerial feed-point is important for efficiency. An effective earth for the largest area possible may help result in a lowered take-off angle with respect to the horizon. Earth conductivity for many wavelengths in a target direction are known to influence the angle of radiation. The subject is complex, and an interested reader is encouraged to pursue a personal inquiry into the appropriate technical literature for more comprehensive information and advice as required.

That considered, I would never subscribe to allowing 'pursuit of the perfect' to inhibit achieving something less: we **ARE** going to have both radiator and earthing systems compromised when establishing an amateur Top Band station on compact living allotments. Let us get on with doing the best we can do with what we can bring to the cause!

## Ground dependency

Common rhetoric would assure us that four radials may be satisfactory for a vertical monopole, and there is evidence to endorse their usefulness in the case of an above-ground 20m vertical (ground plane) for example, but not for a 160m vertical sitting on your average backyard earth. Adding anything from another four up to perhaps 96 radials may improve signals by about 4dB over poor ground, 3dB on average ground and about 1dB over salt water according to widespread literature.

Although I generally avoid use of ferrous metals as electron pathways in transducer systems, the addition of heavy-duty galvanised aviary wire

mesh earth mats have frequently been reported to perform well as part of an MF earthing system, being addressed by Brown (1977), Brown, Lewis & Epstein (1937), Sherwood (1977), Wescombe-Down (2017) and others. Sherwood has been a keen advocate of such mesh being used in conjunction with a radial pod or system, as have I with two 6m by 90cm of 12mm galvanised aviary wire mesh strips beneath my 80-10m earth-mounted vertical, simultaneously also being part of the 60 radial wires, metal fencing, extensive copper water pipe network and metal clad shedding remaining from the dismantled Inverted-L installation detailed by Wescombe-Down (2015, 2016). The strips have underlays of both weed-mat and Sarlon shade-cloth to improve their longevity in the external environment and have been landscaped with river pebbles to obviate any grass cutting obligation. This helical project aerial also happens to be connected to the entire earth mat via my workshop shed frame bonding at the aerial base tuning point.

## Radial wire diameter

If using a small number of radial wires, such as eight or twelve per band, the heavier the wire gauge used, the better. If many wires are employed, the return current may be spread over many more paths, in which case the actual wire diameter becomes less significant.

## Earth/ground rods

Although my preference would be to have a copper earth rod connected to as many radial wires and aviary wire mesh strips as possible, age pension affordability precluded that luxury here. Only one copper rod per five radials was manageable, with the longest wire of each five-batch being selected for 'rod-duty'. Verrall (in Dodd, 2000) suggested, "use as many ground radials and separate earth rods as are practical" (p. 53). It is also well-known good practice to keep them as damp as possible in that configuration.

## Radials' location

Research has shown that elevated radials make for a 'better bang for the buck!' earth system than buried ones. This is due to the earth system return currents not having to negotiate the higher resistance soil when wire elevation is provided. The next preference would be for insulated wires to lie on the earth's surface, though if they must be buried for safety and convenience, try to locate them in the top 50mm of soil. Since a number of my 60 radials are 46m/150ft long, I employed a mixture of the latter two options.

## How many radials?

Although not necessarily an engineering principle or mandate, it is suggested having tips of adjacent radials (for the same band) being separated by no more than half the height of the radial system above earth. How many will that mean? As many as is sensibly practicable and for low band operation 60 to 120 is appropriate (site dependent).

## Helical aerials and earthing

Helical aerials are earth-dependent devices and have part of their loading inductance incorporated within the actual helix itself, thus its inductance and capacitance are both better distributed over the entire aerial conductor. The aerial voltage increases across the loading coil when the height is increased, and this in turn improves the current distribution because where the voltage is lower (towards the helix base), more aerial current will be present. Although use of capacitance hat top-loading is promoted as being more efficient, there may be scope for debate when considering large bore helical verticals. Ric ON7YD, reputable low band practitioner and author, in discussing helical aerial capacity hats, noted:

*"When capacitive top-loading is added, the advantage of a helical antenna will be less, for two reasons:*

- As the antenna has more capacitive top loading, the gain of the distributed inductance increases
- As the capacitance of the vertical part of a helical antenna is rather large compared to a straight 'vertical' (because of the larger diameter of the vertical part), the effect (and thus the gain) of the capacitive top loading decreases".

(Item 2.14, Antennas for 136kHz, retrieved from [www.strobbe.eu/on7yd/136ant/#Top](http://www.strobbe.eu/on7yd/136ant/#Top)

I opted for a 2.1m stainless steel whip aerial in the interest of domestic bliss and sheer ready availability of the item!

Physically and structurally, a suitable large and tall outdoor helix for MF is an engineering challenge, which has probably caused helical MF monopoles to be less 'backyard popular' than they deserve: enter this Top Band aerial project!

## Short vertical aerials

Orr (1978) advised us:

*"An antenna that is electrically small [with respect to wavelength] can perform as an efficient radiator provided power can be efficiently applied to the antenna. Generally speaking, very short antennas have low values of radiation resistance and very high Q. At all frequencies below self-resonance, the equivalent circuit of the short antenna is composed of a low value of resistance in series with a large value of capacitive reactance. In order to establish a state of resonance [and for 50-ohm source matching] the reactance must be cancelled out and an impedance transformation effected. Both requirements demand high-Q networks . . . Generally, the higher the radiation resistance of the [antenna] is, the easier it is to match and the higher will be the efficiency of the network" (p. 27-10).*

## Why did I choose a helical?

A helix may be thought of as

a dipole-loop hybrid. Although presented from a higher frequency perspective, we may extrapolate from a paper by Mayes, Mayes, Nunally & Hatfield (n.d.) and view the general nature of helices:

"Helical antennas offer many advantages over other methods. The helical antenna is relatively compact with its cylindrical geometry. The antenna's geometry is wavelength dependent . . . offers a good gain factor and can be operated as a narrow band, or wide band device" (p. 1).

Their paper considered high voltage applications for UHF use in defence requirements for disrupting electronically-controlled systems, air platform, medical (cell manipulation) and biological (water and food purification) purposes, with the general geometry of appropriate helices having relevance to some amateur radio applications. In the case of my 160m version, turns circumference is not one wavelength as were the UHF iterations, but much, much less and not a lot appeared to have been empirically researched or published regarding 75, 100, 150 or 200mm standard diameter PVC pipes as formers, for compact LF, MF or even HF application.

My innovative 160m helical aerial project therefore emerged as another creative experiment, one intended to produce a worthwhile low band performer (with variant options for transportable and/or 80m adaptations), while also serving as an effective 'active distraction' tool during illness or treatment of any amateur with similar medical conditions to my own. Its successful construction and operation resulted in both objectives being achieved.

## Winding the 160m helix

Recycling the three insulated wires from some discarded 15A mains extension cords provided the helix winding material. It cost me next to nothing at swap meets, flea markets, hamfests' and car boot sales. Once the outer covering

was split, the wires were pulled out and rolled into tractable coils for subsequent winding.

I selected the desired resonant frequency(1825kHz) plus lengths of 75mm PVC piping which were at hand and could enable my preferred overall length/height of aerial. I had two pieces which when joined provided a 5.35m former. At this point a decision may be made to prepare three or four sections for a transportable MF aerial, or a re-scaled version for 80m home station use. Either option would not be difficult to adapt from this article.

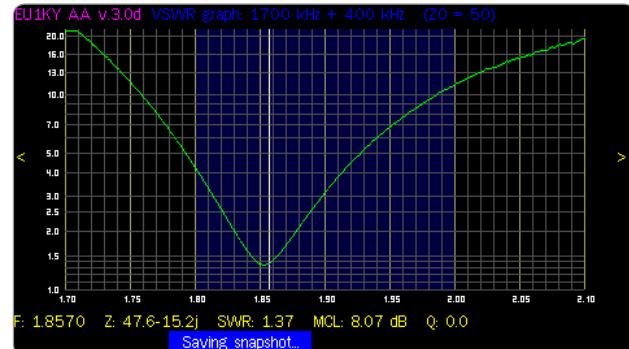
Working on slightly more than half a wavelength of wire being required, I had recovered three lengths of 19.8m and three of 21.3m from the two extension cords. I figure-8 bundled each for winding convenience. The total wound conductor length was 80.7m (262 feet), based on the 3 x 19.8m plus 1 x 21.3m wires soldered together. Adding the 2.1m stainless steel whip aerial to an end cap fitted to the top pipe section, brought the total conductor length to 82.8m (269 feet).

The physical length of the PVC pipe plus whip came to 7.45m (24 feet) which I consider to be quite compact for a 160m aerial. The total weight of the completed aerial was less than 8kg (17.5 pounds).

In case an interested reader wishes to use a configuration different to mine, I present the following Turns Spacing (mm) and Turns Number data of what might fit on a 75mm former of similar length:

Turns Spacing	Turns Number
6	892
8	669
10	535
12	446
15	353
<b>16 My choice</b>	<b>331</b>
20	267.5
25	214
30	178

Although this data is provided in good faith, I have only used the one set as indicated.



Photos 1 & 2: VSWR plots.

I measured and marked the turns spacing with a permanent marker pen on both pieces of PVC pipe. While convalescing from medical treatment I hand wound the formers with them resting across my lap when sitting in a recliner chair(!). Initially I close wound each section of recovered wire then subsequently soldered their ends together and spread them along the formers to match the markings made earlier

When winding, I rotated the former with my left (intact) hand while maintaining wire tension via my right (and partially incapacitated) hand, stopping to apply a robust cable tie every 30 turns or so.

Each time a wire joint was required, I prepared one centimetre of each end and soldered them as I made ready to spread the turns out along the former. Joints were silicone sealed after painting.

Once both PVC sections were completely wound, I double-checked the turns spacings and electrical continuity of the entire helix. Both tubes were then thoroughly painted with two liberal coats of exterior grade acrylic paint plus a patchwork of camouflage greens and browns, followed by two liberal coats of satin finish marine varnish. Quite apart from the obvious long-term environmental benefit, these applications provided extra integrity to the wound helix turns over the entire joined 5.35m. The two pipe former sections were PVC offcut shimmmed, secured by four stainless self-tapping screws, with the joint

and screws being liberally protected with silicone sealant.

### Other researched information

Exploration of research material from Kraus & Marhefka (2002), Orban & Moernant (2009) and Slade (2015) revealed several accounts related to various classes and applications of helical aerials, including long helices and aerial pattern control, while there were also numerous construction articles for HF helices based on 10-40mm diameter formers. Very few were noted for MF and/or larger bore PVC tube formers.

### On-ground testing prior to rooftop installation

Prior to the rooftop installation, the helix was tested at ground level, albeit only strapped to a garden trellis post, immediately adjacent to a full 1100-litre metal rainwater tank and only one metre from the side wall of my large metal workshop shed: not an ideal RF environment for such a high-Q aerial!! A surprisingly good 2:1 SWR bandwidth of 13kHz was achieved under these test conditions. Reception QRN was noted to be about 1.5-2dB down on that of the previous large Marconi Inverted-L.

### Helix mounting

The rooftop mounting site was the junction of my 10m x 3.5m metal workshop shed gable roof end with its flat metal roof veranda. To keep

the radiator base completely clear of metal surroundings I used three spaced proprietary plastic saddle brackets and a pre-painted 120cm (4 feet) exterior grade flat board for mounting a 100mm diameter PVC “socket” into which the feed-point end of the 75mm helix would be inserted and secured. That board was pre-bolted onto the workshop gable end for rigidity. I also fitted a timber baseboard to bridge two channels and ridges of the verandah roofing iron.

At a point where the inserted pipe would stand just above the highest metal point of the roof structure, I drilled wall-to-wall across the socket tube & slid two 13mm diameter Teflon bars parallel and horizontal through the holes prior to securing them: they would form a cradle upon which the 75mm aerial pipe would sit when inserted into the socket. Three 3mm UV-stabilised black poly rope guys secured at the 5m height point on the aerial would provide the necessary 360-degree tension to hold the helix in place, resting on the two Teflon bars.

The end of the helix wire needs to be weather protected and away from metal for its entire route to the tuning network. I routed it inside the 100mm PVC vertical socket pipe and through the gable end via the Delrin disc. There would be various ways for achieving the same outcome. Thank goodness for silicone sealant!

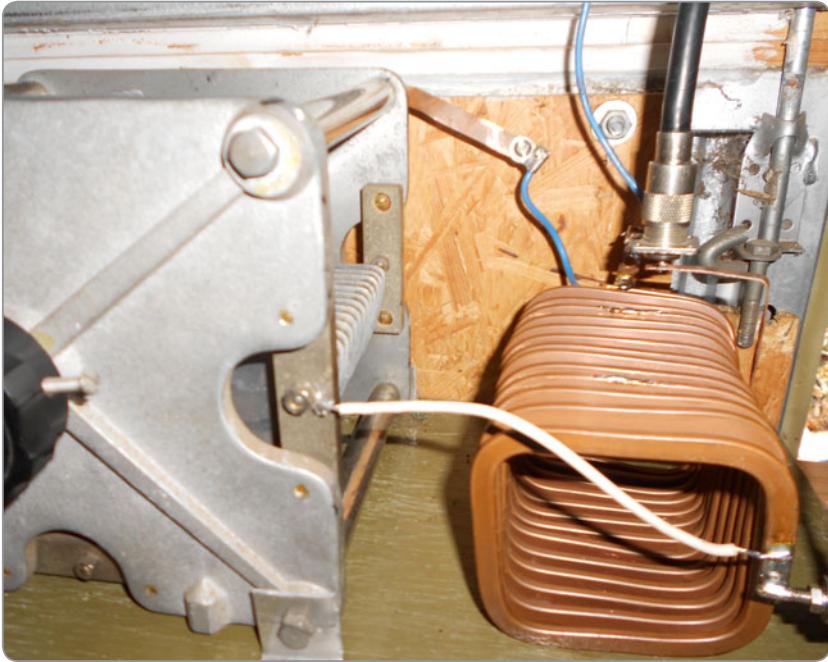


Photo 1: Matching unit rear view.

### The tuning network

I happened to have a large (200x200x200mm/8-inch cube) very wide-spaced plate 1000pf variable capacitor taking up valuable storage space, so it was co-opted for the base tuning network. For 100W 160m operation, a 450pf broadcast type capacitor would suffice.

Firstly, a timber shelf was pre-fabricated and mounted against the interior side of the shed gable end, right above the access door, convenient for step-stool tuning or maintenance of the network. The large capacitor was secured to the shelf and a homebrew inductor of about 20uH was connected to it. Nothing formal, the inductor is flat-wound, 7mm x 2mm copper, 90x90mm square profile with radiusd corners and 14 turns spaced 8mm apart. I bought it for a dollar at a 'hamfest' years ago and it finally found its life-purpose! Trial and error with fixed and/or roller inductors around 15-25uH are suggested as being ballpark options.

The tuning process using a GDO and two SWR meters, one in the transceiver and the other right

at the tuning network, eventuated in a 50-ohm match at 1825kHz as per the design specification. The 2:1 VSWR bandwidth had now improved to 37kHz, and the 1.5:1 VSWR bandwidth (my preferred data reference point) was 23kHz with the inductor tapped four turns up from the earth end.

The variable capacitor is about 45% meshed. A heavy copper strap was used for network connections and a 45cm heavy earth lead fastened securely to the metal shed framing, already part of the extensive bonded earth system previously described.

Approximately 6m of RG213 cable connects the tuning network to the coax switch used for aerial changeovers at the operating position, all my operating being manually controlled.

Importantly, and due to my physical infirmity issues at the time, plus his personal interest in the project, friend Andy VK5AAQ helped me on the verandah roof to stand the helical erect in its socket and do the initial guy rope tying off while I held the aerial firmly. He also conducted the base tuning process from a step-stool inside the shed door opening. Apart from those critical phases everything else in the project was completed by one person as planned, and I subsequently re-tensioned the guy ropes as required. The completed and installed helical is shown below. A photo of the PVC former end cap was taken prior to the helix turns being spaced correctly and secured. A 16mm spacing, plus/

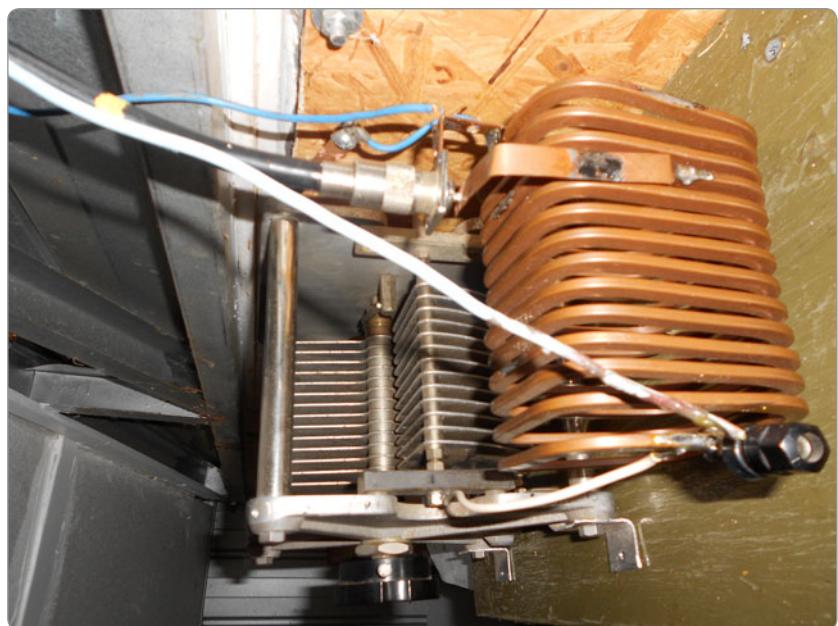


Photo 2: Matching unit side view.

minus millimetric hand-winding differences, was maintained throughout, there being no intentional tapering at any stage.

## VNA analysis

VNA was provided by Leigh VK5KLT who followed the development of this aerial from its conception. It was an original notion expanded into a creative practical reality, without any imitation or plagiarism.

A sketch of the parallel impedance matching networks is included here, along with VNA screen shots as mentioned above.

## On-air performance

Readability and Signal strength reports were accepted as given on-air and were not based on near- or far-field measurement. Consistent feedback for an 807 AM transmitter up to 5x9 +20dB was received from our Adelaide metropolitan AM net membership. Those operators geographically closer reported stronger reception, not surprisingly. Other participating stations in country environments have consistently reported:

225km Q5; 251km Q5 271km Q5; 300kms including some seawater 5x9 + 20db; 375km 5x9 to 5x9 +10db. In addition, my net signals have been copied S1 to 5 as far away as Canberra @ 960km and Sydney @ 1160km.

## CW DX

Having had only limited use for DX operation, the aerial has regularly provided two-way CW contacts as far away as Russia & Ukraine, some 10 000kms @ RST of 349, 449, 549.

## Summary

Obviously, it is moot as to where ground and sky wave demarcations may have occurred at any time.

This aerial project was age-pension affordable and relatively easy to construct, even having only one fully effective arm and shoulder. It is compact with a low visibility profile in suburbia, and two years

on, certainly remains a reliable and effective performer for what it is. Amateur radio always used to be, and always will be to me, an experimental-sharing hobby, not wallet and commercial brand name based.

Our neighbours say the Top Band helical is not an unsightly structure, no interference is generated, and they appreciate the camouflage paint job. I am back on 160m having successfully executed a very rewarding and cathartic project while enduring the worst protracted medical episode of my seven decades. I hope this article encourages others to also have-a-go!!

Best 73, Doc VK5BUG

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# VHF/UHF - An Expanding World

David K Minchin VK5KK

## Introduction

This month we have a report on the OE visit to the CSIRO Parkes "Dish", receiver modifications for the GARC 3.4 GHz transverter and some details of the "VK5" 122 GHz project. Kevin VK4UH's Meteor Scatter section round up the column.

## Austrians and 122 GHz at the CSIRO Parkes Dish

During the month of November, Wolfgang OE4WOG and Hans OE2JOM were in Australia. Whilst they were here, they went on a "road trip" that included a visit to the CSIRO Parkes dish. Both had seen "The Dish" movie so were keen to see it in real life. After contact with David VK2JDS, a trip to the dish was arranged on 12/11/2019 along with Garry VK2GLJ, John VK2EJM, and Ross VK3ER from the Amateur Radio Central West Group. As Wolfgang also had his 122 GHz equipment with him and David also is active on 122 GHz part of the day's activities was to include a field test somewhere close to the Dish!

The weather wasn't the best on the day with 40 – 50 KMH winds creating a dust storm and the dish was "Parked" bird bath style for its safety. The visitor centre is well presented with a great amount of the original S-Band equipment on display. After the visit, it was decided to set up 122 GHz along a 1.5 km path on the road outside the facility with VK2JDS one end and OE4WOG, OE2JOM and VK5KK at the other. The amount of dust limited visibility to the point that neither end could visually see the other station. At least



Photo 1: David VK2JDS with Ross VK2ER and John VK2EJM on 122 GHz at Parkes.

the dew point was low! Contacts were made around 0400 UTC with good signals in both directions on SSB and FM. Wolfgang was using a small 200 mm prime focus dish machined to 10uM accuracy. The calculated gain is around 45 db!

## New 47 GHz Australian SSB and Digital Distance Record

In last month's column, we discussed the importance of weather and its influence especially on frequencies on and above 24 GHz. The amount of water and oxygen along the path is the main limiting factor. Beyond that it becomes new territory as little is known about various propagation modes like Tropo, etc. Iain VK5ZD's website that displays the calculated path loss for 24, 47, 76, 134 and 241 GHz has become a well used resource to quantify mmWave band conditions. The website can be found here <http://weather.vk5microwave.net/Weather.aspx?State=H>

Photo 2: Hans OE2JOM, Wolfgang OE4WOG & David VK5KK on 122 GHz at Parkes.



The ultimate limiting factor is the availability of “Line of Sight” (LOS) paths. Unfortunately in Australia the longest paths from hills/mountains that are accessible (or not covered by trees!) are all around 180 – 200 km. Most very good paths are a long way from most mmWave operators. Finding these paths is a time consuming process looking at our favourite software for analysing paths [www.heywhatsthat.com](http://www.heywhatsthat.com). You can find a high point at one end but often there is another range of hills that may closely intersect the path. Should a suitably high enough location not be available at the other end the path may work OK on 10 GHz but not on 24 GHz and above. Radio range is greater than actual visual line of sight but objects in the way can easily scatter signals so the actual path does need a closer look when the Fresnel zone is close to objects.

In March, VK5ZD and VK5KK worked 177km from Mount William to the Otway Ranges on 10, 24 & 47 GHz. For the OE “road trip” tour of VK2 and VK3 we considered a return to the same locations but the weather prevailing for the week of the trip had a large amount of moisture from South Western winds. The Dew point was expected to be between 10 – 12 C making the path marginal at best on 24 GHz and above. So instead we went looking for some locations further inland.

On 14/11/2019 Iain VK5ZD travelled to a spot east of Bendigo (QF23jl) just in view of the Australian Alps area in VK3. VK5KK drove from Yass to Albury/Wodonga then along the Alpine Way. After a bit of searching, a location was found on the side of a track in QF33jf around 1,600 metres ASL. Tests on 10 GHz and 24 GHz produced good signals over the path just using a 25 dbi patch and 300 mm dish antennae respectively. Signals were much lower but still audible on 47 GHz. Over the next hour signals improved as the clouds drifting by lifted and a good SSB contact was made at 0425 UTC, 51 both ways on 47088.150 MHz over 180.8

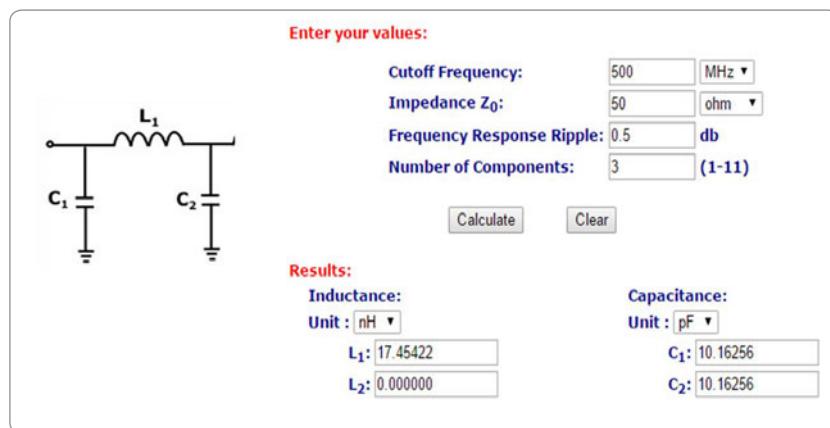


Photo 3: New IF filter for 3.4 GHz GARC transverter.

km. A JT4g contact was made after the SSB contact with signals peaking to – 6 db. VK5KK switched to a 600mm dish with a Cassegrain feed on 47 GHz and did some comparative tests vs. a shepherds’ crook antenna (within 1 db of each other).

BOM data indicated that Dew point was probably around 7 db over the path. The calculated path loss on 47 GHz using that figure was close to what was found in

reality. For 76 GHz, the path loss worked out to be much higher however as it is a simple matter to swap a transverter into the common antennae system we decided to give it a try. No signals were found in either direction.

### 3.4 GHz GARC Transverter Modification – Improving the receiver.

**The Original IF filter**, when modified as per the GARC notes, has only around 1% Bandwidth (5 MHz) and is extremely touchy to tune. The through loss is still then quite high. Technically, there is no longer a reason to have a “sharp” filter in the receiver IF. The original digital baseband receiver would have been as a broad as a barn door, the filter was a “custom” modification replacing the original SAW filter (see below) to give narrower bandwidth than the original 20 MHz.

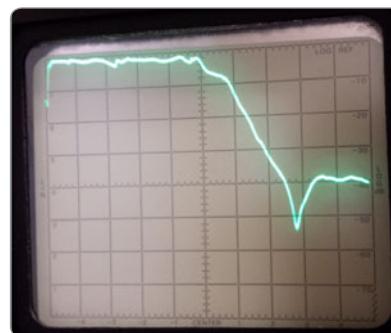


Photo 4: GARC Transverter IF filter plot from 0 – 1000 MHz.

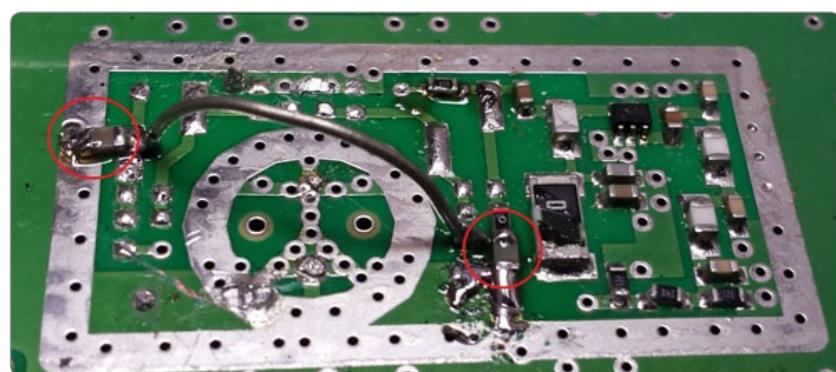


Photo 5: GARC Transverter IF filter layout.

The tiny trimmers on the IF filter need a small metal tuning tool, unfortunately any metal tool de-tunes the critical middle trimmer when you touch it making the filter hard to tune. You have to second guess the peak on the middle trimmer with this de-tuning, the only way to do that without a signal is listening on SSB for a sharp noise peak. In summary, way too fiddly!

**The New Filter.** As we are using a narrow-band SSB/FM transceiver after the transverter we don't need a sharp filter anymore. Adjacent channel interference is not a big problem for us so the only requirement now is to reject any LO or image products appearing in the IF (all above 500 MHz). You could just remove this filter (in fact some have) however with a bit more effort (3 components) it can be replaced with a simple Low pass filter to reject any signals above 500 MHz.

A simple 3 element Low pass filter can be calculated using online tools like the one at <http://www.calculatoredge.com/electronics/ch%20pi%20low%20pass.htm>

The end design is a 17nH inductor and two 10pF capacitors. The 17nH inductor can be 22mm of 0.5 mm enamel or tinned copper wire bent into a semi hoop shape (see further).

The filter was constructed with different shape inductors and all worked close to what had been calculated. The filter was swept from 0 - 1000 MHz, the pass band up to 500 MHz has loss/ripple around 1 -2 db with a sharp dip at 780 MHz (-52 db). From 850 MHz upwards the attenuation is > - 40db, more than sufficient.

**Step One: Removing the PCB.** The add on IF filter is connected to the main board by around 10 TCW wire links. All but two links simply bond the two ground planes together. The other two are in the IN/OUT pins for the filter. "IN" the red circle on the left, the "OUT" is the red circle on the right. Note the outer 2 coils have been removed in the photo. The filter board can be removed without

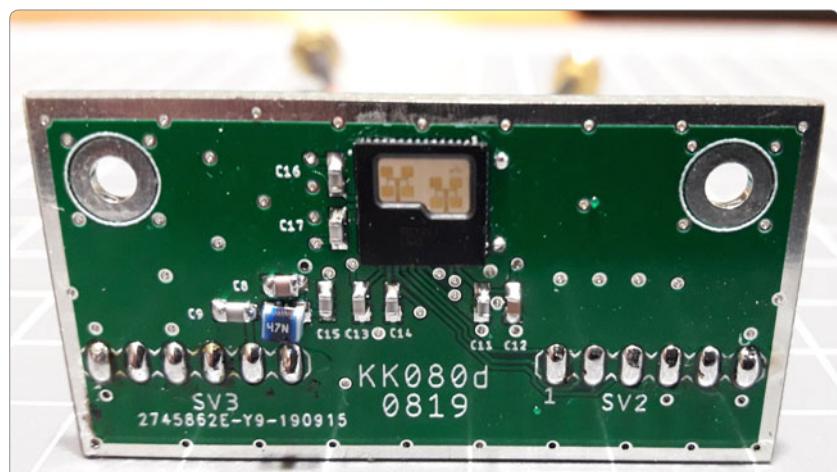


Photo 6: SiRadar 122 GHz RX and TX patch Antennae.

taking the main-board off the Panel antenna. The easiest way of removing the filter board is to slowly snip the wire links using a very thin pair of wire cutters. Be careful not to damage the main board.

**Step Two: The New Filter.** Once the filter is removed you will see that originally a SAW filter (the Round track pattern) was intended to be installed similar to the one removed from the TX IF! There is already a series capacitor on the output side so all we need to do is add the three components of the Filter. In the photo I have used 10pF chip capacitors (red circles) in the new filter only as I had them. 10pF leaded capacitors will work fine, just remember to trim the leads so they can be soldered in with no lead showing to minimise the series inductance. The L1 inductor is a piece of 0.5mm TCW; I cut a piece 25mm long to allow for the solder fillet each end. The wire is shaped as a hoop and soldered between the two points where the capacitors are soldered in. The shape is not critical; it just needs to sit vertically as per the photo.

**Results:** After the modification you should now hear some (a lot!) of IF noise when you listen with a SSB transceiver on 442 MHz (339 MHz). If you have modified your transverter to use the original TX filter as the receiver filter you should now hear some difference in IF

noise when this filter is adjusted. The TX filter should only need minor adjustment as it is already tuned to cover down to 3410 MHz.

The other modification that can be done to improve the receiver is to remove the TX filter in front of the receiver. It is very hard to align this without a signal source; if it isn't the receiver will be "stone" deaf! Even tuned correctly it will add a couple of db loss (I.e. noise figure) to the receiver. This filter is better placed after the 3.4 GHz front end as the block filter instead of the ceramic filters borrowed from another PCB. You can directly connect the RX coax from the antenna relay to the RX preamp input where the "Zero" ohm resistor connects to the RX filter. Just remove this resistor and connect the centre of the coax to the pad closest to the RX preamp tin cover in the red circle below. The device used in the first stage of the transverter has around a 3 db noise figure so is more than adequate to use without a preamp.

## Progress on 122 GHz Project(s)

122 GHz has been a bit of a feature in this column for a few years now with nearly a dozen VK stations with equipment now and the Australian distance record being extended from 1.5km to 69 km! Those who read Dubus and/or are part of the discussion groups online would be

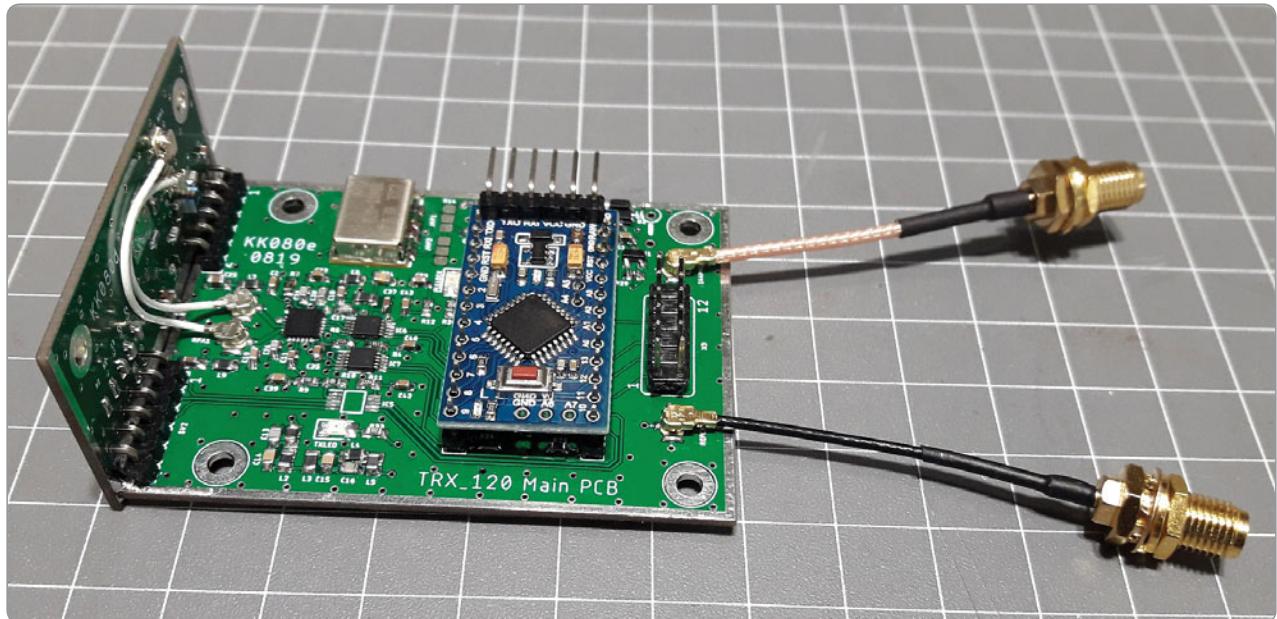


Photo 7: VK5 SiRadar 122 GHz project – Main PCB Layout.

aware of Andrew VK3CV's 122 GHz SiRadar project. Tim VK2XAX has coordinated a crowd funded project to commercially produce "plug and play" PCB's and some antenna components. At last count, over 350 had been ordered worldwide! These are expected to become available in early 2020.

122 GHz is a the transition point between old and new technology as the PCB's for 122 GHz diode mixers and multipliers are no longer available from Kuhne Electronics. Whilst the new technology has its advantaged (better receive noise figure) the path forward for distance records will probably be a combination of both. Recent testing of the SiRadar chip revealed that the power output is probably around -8 dbm vs. +1 dbm of a good Tripler, i.e. 10db lower.

The end result has been some work within the VK5 group to develop a project to optimise the SiRadar TRX\_120\_001 chip for receiver applications. The Hardware (4 layer PCB's) have been completed that includes a full image reject receiver (3 db gain vs. DSB NF) and PLL resolution down to 38 Hz at 122 GHz. The PLL allows direct digital modulation using JT4f or JT4g. PLL lock time is in the order of a few mS so any simple digital mode (4 or less tones) could be used a reasonable baud rates. Tone purity is more than sufficient for digital modes and phase noise is equal to the best 122 GHz systems we have seen so far. More details will be published in AR soon. There is a YouTube video showing CW QSK operation at <https://youtu.be/WedwlyjRJKY>

## VK Microwave Operators Directory

The updated version of the list can be found online here <http://www.vk5microwave.net/VKMicrowaveOperators.pdf> 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!

## 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



## 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)**

# Meteor Scatter Report

Dr Kevin Johnston VK4UH

## THIS MONTH

A typo apology, more on Trans-Tasman Meteor Scatter, MS operating protocol, forthcoming Meteor Showers.

Regrettably the typo-gremlins have crept into previous editions of this column. The secondary 2m MS operating frequency has occasionally been quoted as being on 144.350MHz which is incorrect. The correct VK Primary 2m MS focus frequency is 144.230MHz, the correct secondary 2m MS focus frequency is 144.330MHz. This secondary frequency has been used for a variety of purposes including Special Event or DX-Pedition stations, testing of new modes, crossed-period operation (see below) or non-standard sequences ie 30second instead of 15 second periods etc. during the normal weekend activity sessions.

In the last edition we looked at the subject of Trans-Tasman MS activity i.e. between stations in VK and ZL. As was indicated in that article, when I started coordinating this column about seven years ago, meteor scatter contacts were commonly reported during the summer peak seasons between stations in New Zealand and the southern VK call areas. Indeed, there were, at that time, dedicated activity sessions running on Saturday mornings to encourage this Trans-Tasman MS operation. These sessions were run early in the morning, prior to the normal VK MS sessions, using FSK441 mode. From memory, all VK's ran first period and ZL's ran 2nd period on 144.330MHz, the secondary focus frequency. For VK stations further north in Queensland VK4, MS QSOs across the ditch has always been problematic since all the major ZL population centres lay beyond the usual 2300km distance limit

(horizon) for "normal" meteor scatter propagation. This effective limit is determined by the geometry of the curvature of the earth itself and the 100km height of the E-layer, where the majority of meteor ablation occurs. At that critical distance, around 2300Km, signals have to be reflected from ionised meteor trails crossing exactly at right-angles to the midpoint of the path between the two stations and have to be "horizon grazing" i.e. zero elevation, at both ends of that path. For meteor scatter propagation to go beyond that normal MS Horizon generally requires the assistance of another mode of propagation, typically Es or tropo-ducting at one or both ends of the path, to fill in the gaps.

I have not however seen a report of a VK-ZL MS contact for some years. This is not to say that there is not MS activity in ZL, judging by posted reports there appears to be plenty, however from those recent posts it appears that ZL operation is now based around 144.260 or 144.360MHz. Currently, as here in VK, our ZL colleagues are employing the newer MSK144 mode and 15 second transmission periods. I was confused as to how or why this shift in focus frequency had occurred in New Zealand. Over the last few years the VHF band-plans in both countries have been reviewed and updated. In the current WIA VK band-plans our MS focus frequencies correctly lay in the spectrum allocated for "DX digital modes" (144.220-144.240MHz, 144.320-144.340MHz and 50.220-50.240MHz). In the corresponding

notes on Narrow-Band Modes in our latest band-plan, 50.230 and 144.230/144.330MHz are specifically identified as focus frequencies for "High Speed Meteor Scatter modes with bandwidth up to 3KHz". In the current NZART band-plan these frequencies lie in the spectrum allocated "all-mode less than 16KHz bandwidth" or "all-mode less than 6KHz bandwidth". These focus frequencies are thus entirely compatible with Trans-Tasman MS operation under both band-plans. The recently reported MS activity in ZL, particularly on 144.260MHz, however is not. Under the current NZART band-plan the spectrum between 144.250 – 144.300MHz is allocated for "Beacon Use" only, indeed the Hamilton 2m beacon is licensed on 144.260MHz. Under the WIA band-plan the spectrum 144.240 – 144.300 is designated as a "guard band" for the ZL beacons with all activity being severely discouraged in VK on these frequencies - for good reason.

Initially I found it hard to understand how we came to be in this position? It has become apparent that the change in frequency has been driven from beyond both of our shores. In the last four years there have been several major changes to meteor scatter operation across the globe. The most significant being the worldwide adoption of MSK144 mode in place of FSK441 and the adoption of 15 second transmission periods. This new Forward Error Correction (FEC) mode is available in at least two software platforms WSJTx and MSHV. Both of these

platforms come with standard operating frequencies for a variety of digital modes and bands pre-populated in the down-loaded software. In many instances however those frequencies were tailored for activity in North America and Europe and not for Australasia where some are in conflict with existing band-plans in our region. So, the reason it appears that ZL activity is happening in the beacon section is because the software took it there "out of the box".

Thankfully it is very easy to amend the prepopulated frequency section in all the current software platforms where MSK144 is found. The lists are extensive for a variety of modes, frequency bands and geographical regions. These listings and are accessed from within the pull-down settings menus in the software. A plea this month for all operators to access these data bases on your shack computers and ensure that appropriate frequencies for both meteor scatter and indeed other digital modes are correctly entered. The pre-populated 2m and 6m frequencies particularly for the meteor scatter modes especially 144.260MHz should be overwritten with our own focus frequencies to avoid conflict with current band plans and interference to the beacon networks here.

## Activity Sessions

Another plea to all operators this month in regard to the selection of the appropriate transmission periods during the weekend activity sessions.

Meteor Scatter operation is almost unique in being focussed, with simultaneous transmission by several stations, on a single operating frequency. Even WSPR, JT65 and FT8 modes employ small variations around a central frequency and/or random transmission periods. Operation in MSK144 mode for MS involves the selection of one of two accurately timed 15 second transmission periods. Where first period is

selected, transmission occurs from 0-15 seconds and from 30-45 seconds, the "even numbers", in each minute. Where second period is selected, transmission occurs extends from 15-30 seconds and 45-60 seconds, the "odd numbers" in each minute. Reception occurs in the opposite period to the selected transmission period.

Obviously two stations attempting a meteor scatter contact MUST be in OPPOSITE periods in order to make contact. One station is receiving while the other is transmitting and visa-versa. What may not be immediately obvious however is that MS stations MUST also select the SAME transmission period as all their local neighbour stations i.e. anyone else in range of any other direct mode of propagation. If this is not adhered to then nearby stations will be completely paralysed by continuous signals occurring when they are in receive mode and the chance of any MS decodes and contacts will be obliterated. In VK we have a well-established protocol for which call areas use which transmission period during the weekend activity periods.

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

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

Southerly stations (VK1,3,5,7)  
**ALWAYS** run **1st period** beaming North, Northerly stations (VK4)

**ALWAYS** run **2nd period** beaming South.

Stations in the middle call-areas VK2 and VK1 change period depending on the day. Saturday run 2<sup>nd</sup> Period beaming South, Sundays run 1<sup>st</sup> Period beaming north.

Clearly the protocol is not perfect. For example, it is not possible to work local stations in your own call-area or for a station in VK7 to call VK3 and comply with the protocol. Neither is it possible

for a VK1 to call VK2 or indeed call a VK4 on a Saturday. There are also issues for stations operating on the borders between call areas. The protocol does however give the best chances to everyone involved.

It has become all too common, particularly on 6m, for stations to be swapping transmission periods and causing mayhem and angst. My personal plea to all MS operators is to stay in your correct transmission period, on both 2m and 6m, 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. Where stations want to operate outside the protocol and work crossed period then it is still fine to do so outside of the formal activity periods or simply by QSY'ing to the other secondary operating frequencies.

## Forthcoming Meteor Showers

As this article is being prepared, the next major Meteor Showers will be the Orionid Shower expected to peak around the 22<sup>nd</sup> October. Regrettably this shower will occur mid-week when activity is low and will likely be over before this article is in press. The Orionids is a Class 1 Major shower and has a predicted ZHR of 25/hour. This shower is the result of the Earth passing through debris remaining after the last passage of Halley's Comet through our solar system. Hopefully I will be able to bring any reports received for the first edition of the new year

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



# SOTA and Parks

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## MSCARC & IARS WWFF Field Day

Illawarra Amateur Radio Society (IARS) and Mid-South Coast Amateur Club (MSCARC) joined forces to host a field day with the activation of WWFF National Parks. Given the number of National Parks they have in close proximity the main frequencies used were 2 metres and 70 cm rather than the usual HF.

Stations were set up in the following parks as per Table 1.

And received contacts from as per Table 2.

In all between 20 and 30 people took part and enjoyed an afternoon barbecue. As all involved enjoyed themselves, they intend to host again in 2020. Contact David VK2LDW from MSCARC or Keith VK2KQB from IARS for more information.

## MDRC SOTA Newbies Day

Moorabbin & District Radio Club (MDRC) hosted a newbies day from



Photo 1: Group photo MSCARC & IARS.

Arthurs Seat VK3/VC-031 in VKFF-0750. Three Foundation call holders revived their first experience of HF by qualified this site. Two old hands also qualified but a decline in 40 m activity plus having three stations on 40 m at the same time meant some missed out.

Ron VK3AFW used a simple wire antenna to secure a contact with Peter VK3YE on 80 and 160 m. He was at Chelsea Beach (30 km) using a mag loop.

An interesting day for all leaving several with enough enthusiasm to do another activation soon. Contact

Ron VK3AFW from MDRC for details as to next event.

## VK/ZL/JA/BX - EU/UK S2S QSO Party

The regular event was again hosted in October with operators reporting gale force winds, rain and poor astrometric conditions. This all contributed to slow activations with limited contacts. ZL and JA contacts were reported and whilst I could hear Mike 2E0YYY from VK3/VC-018, I could not confirm a contact, even with 30 W into a vertical. Even so participating in such an event allows you to fine tune operating techniques (how to select and operate from protected position so as to not to get your radio wet).

## Recent Highlights

Two milestones were passed with Andrew VK1AD achieving Double Mountain Goat status and Peter VK3PF achieving CW Mountain Goat status. Both achievements reflect a dedicated if not obsessive approach to SOTA.

Details as to the effort and planning involved is available from:

**VK3PF:** <https://vk3pf.wordpress.com/2019/10/19/a-loopy-plan/>

**VK1AD:** <https://vk1nam.wordpress.com/>

## ParksnPeaks Updates

CAPAD 2018 (terrestrial only) data has been released. This is a

VKFF-0447 Seven Mile Beach National Park	John, VK2NJP Gerald, VK2HBG Keith, VKJ2KQB	Gerroa Picnic Area
VKFF-0249 Jervis Bay National Park	David, VK2LDW Blake, VK2FBW	Hammer Head Point Lookout
VKFF-1329 Illawarra Escarpment State Conservation Area	Rob, VK2XIC	Mt Kembla Lookout
VKFF-1885 Barren Grounds Nature Reserve	Walter, VK2LM	Various locations

Table 1

Portable Stations	Rob, VK2DRB John, VK2BHO	Currawong Warilla
Home stations Shoalhaven	John, VK2JG Ray, VK2AX Dave, VK2AWZ David, VK2DDI	Sanctuary Point Nowra Vincintia Bellawongarah
Home Stations Wollongong	Steve, VK2BGL John, VK2XGJ Robert, VK2BBI Arthur, VK2FWAA	Jamberoo Dapto Corrimbal Grenfell (moving into Area)

Table 2

welcome update to the previous release in 2016.

The WWFF regional coordinators are able to keep up with names changes and minor changes between releases. The CAPAD data is considered the definitive source for Park sites.

This data is used for Parks'n Peaks mapping and to generate WWFF site boundary files. These boundary files are used by activators to ensure operating from a valid position and to verify access for some of the challenging sites, as well as generate cool images for their blogs.

2018 release has a significant quantity of new parcels of land added to existing parks and the database now supports multiple pieces. Previously a park with multiple pieces presented a challenge when preparing accurate boundaries. With the introduction of a new field (PA\_PID) these distinct parcels are able to be included so as to present a complete view of the park.

Thanks goes out to Marc VK3OHM, as a lot of effort goes into the verification of site data and the generation of park boundaries files. The boundary files have been updated to reflect the changes and are available to all -<https://parksnpeaks.org/viewMaps.php>

Please visit the CAPAD site and complete the user survey so as the responsible authorities are aware of use and value, we place on said data. <https://www.environment.gov.au/land/nrs/science/capad>

## PnP iPhone App

The Parks'n Peaks iPhone app has been published on the Apple App Store. This was no small feat considering the criteria for release required by Apple and features requested by users.

Thanks to Sue VK5AYL and the team of patient testers for getting this excellent resource available. Help files and more information are available from Sue: <https://www.vk5ayl.com/>



Photo 2: Rik VK3EQ/p on Mount Cooper VK3/VG-031.

## SMS Spotting

The SMS Spotting interface hosted by Parks'n Peaks has received a major upgrade. Thanks to those who supported with donations of hardware and funds (quite a few, with special call out to Ian VK5CZ and Ron VK3AFW). The SMS interface is of particular interest to activators working on the fringe as an SMS will often make it where others fail.

The service is now running on a Raspberry Pi with a dedicated 4G/LTE hat. The days of hung phones and poor service are behind us. For more information as to use is on Parks'n Peaks <https://parksnpeaks.org/ParksnPeaksSMS.php> with the first action to create an account and register your phone.

## Coming events

### New Year's UTC Rollover

You will see a lot of planned mountain activations for the New Year rollover, some in planning for months. This is a special time in the

SOTA calendar for VK as occurs at 11 am local EDT Australia. As activators can only claim points for a summit per calendar year, you can exploit the timing to make double the chaser, activator and summit to summit points over a couple of hours or position yourself on one of the challenging summits. As long as you can gain 4 contacts before 11:00 am AEST you are ahead.

Either way don't stay up all night celebrating the time zone, get to bed for an early start and join in the SOTA UTC New Year party.

### 2020 SOTA challenges

Basically, certain bands or modes are given a focus for the first week of each month to try and promote SOTA activity where there may not currently be any. Whilst the bands and seasons may not be perfect down under there is interest in the use of Data modes. Also highlights differences us and our northern friends, 80m is often used to secure local contacts when conditions on 40m are challenging.

January	LF – 160 m & 80 m
February	Data modes
March	Digital voice - C4FM / DSTAR / DMR
April	LF – 160 m & 80 m
May	Data modes
June	12 m, 10 m & 6 m
July	70 cm
Aug	17 m
Sept	Data modes
Oct	Digital voice - C4FM / DSTAR / DMR
Nov	LF – 160 m & 80 m
Dec	12 m, 10 m & 6 m

Full details, and debate, are available on the SOTA reflector at <https://reflector.sota.org.uk/t/a-sota-challenge-for-2020-and-beyond/21101>

So, until I hear you on air,  
73 & 44  
Allen VK3ARH





# DX Talk

Luke Steele VK3HJ  
e [vk3hj@wia.org.au](mailto:vk3hj@wia.org.au)

Sunspots are few and far between, and short-lived when they do appear. The 10.7 cm Solar Flux also continues at around its lower limits. The weekly ARRL Propagation Report by K7RA for 25<sup>th</sup> October reports: "Over the past week, on Monday, October 21, 10.7 cm solar flux sunk to possibly the lowest level in recorded history. Solar flux was 64, which is even lower than the 64.4 value recorded way back on July 2, 1954 at the start of Solar Cycle 19, by far the biggest solar cycle ever recorded. I understand that solar flux dipped to 64.2 in 1906."

## Around the bands

From your author's station at 37 degrees south, little has been heard or worked on 17 m and above over the past few months, but those further north are reporting activity up to 10 m.

There was quite a lot of activity on 160 m around the end of September, with many stations worked in Asia. Some were worked in North America, but the band really didn't open in that direction for the Equinox as usual. Most of the activity on 80 m has been in FT8, with some good DX worldwide on that band. Forty metres has been generally quite productive, along with 30 and 20 m, most days. Stations further north reported quite good conditions on 17 and 15 m to Europe late afternoons in late October. On 12 and 10 m, some East Asian stations have been seen on FT8.

Although the DX activity has been somewhat limited at times, the bands are far from "dead"!

## DX Heard or Worked

During September, Puiu YO5BIM was active as P29VIM from Port Moresby. Four Latvian operators were active as T30L from Western Kiribati then C21WW from Nauru.

EX0QP DXpedition to Kyrgyzstan was rather difficult to work from here. 6O7O was heard late nights here on 40 m. K7TRI was an IOTA activation at the spectacular Tillamook Rock Lighthouse, off the coast of Oregon. T6AA continues to be active from Afghanistan. A35JT Tonga and ZK3A Tokelau were nice "local" DX.

October was a very busy month for DXpeditions, including TO80SP St Pierre & Miquelon, 7P8AO Lesotho, A82X and A82Z Liberia, T30GC Western Kiribati, T88UW and others visiting Palau, 5K0K San Andres & Providencia, 5T5PA and 5T2KW operated from Cap Blanc, D68CCC Comoros, VP6R Pitcairn Island, VK9NE, VK9NC and VK9NG Norfolk Island. TT8SN Nicolas has been active from N'Djamena Chad. 9G2HO Ho Technical University station has been quite active too.

## Upcoming DX

DXpedition activity scheduled for July and August includes the following.

**TX7T Marquesas**, 6 – 17 November. DXpedition team of eight will be operating from Hiva Oa Island (OC-027) on 160 – 6 m, CW, SSB and FT8. QSL via LotW or via M0URX QRSS. For more information see: <http://www.marquesas2019.com/>

**YJ0RRC Vanuatu**, 8 – 13 November. Yan RZ3FW and Sergei R4WAA plan operations from Tongoa Island (OC-111) on 15, 20, 30 and 40 m in CW, SSB, RTTY and FT8. QSL via Club Log QRSS. For more information see: <https://r4waa9.wixsite.com/yj0rrc>

**8Q7XR Maldives**, 10 – 30 December. Roly ZL1BQD will be operating from AS-013 on 80 – 10 m, in CW, SSB and FT8. QSL via ZL1BQD.

**5R8VX, 5R8KU Madagascar**, 12 – 25 November. 5R8VE (JF1OCQ) and 5R8KU (JA8VE) will be operating HF bands, in CW, SSB and digital modes including FT8 and FT4. QSL via home calls.

**VK9CZ Cocos-Keeling** (OC-003), 12 – 29 November. Keith GM4YXI and Chris GM3WOJ will be operating 160 – 10 m in CW, SSB, FT8 and possibly FT4. Will be in the CQ WW

DX CW Contest, 23 – 24 November. QSL via LotW, Club Log or N3SL. For more information see: <http://www.vk9cz2019.com/>

**YJ0FWA Vanuatu**, 14 – 20 November. Yan RZ3FW and Sergei R4WAA plan operations from OC-035 Efaté Island, on 160 – 17 m in CW, SSB, RTTY and FT8. QSL via Club Log QRSS. For more information see: <https://r4waa9.wixsite.com/yj0rrc>

**H40KT, H40TT Temotu**, 14 – 26 November. K1ZW will be operating as H40KT and N7QT as H40TT from OC-065 Pigeon Island. They will be on 160 – 10 m in CW, SSB, RTTY and FT8. QSL via M0URX.

**5H3UA Tanzania**, 16 – 28 November. A DXpedition of five operators will be active from AF-032 Zanzibar Island on all HF bands on CW, SSB and Digital modes. They will be operating as 5H3EME on 6 and 2 m. The will be active in the CQ WW CW Contest. QSL via LotW.

**XV9D Vietnam**, 17 – 30 November. Mats RM2D will be focusing on 160 – 40 m, with his main goal providing All Time New Ones, and new band points on the Low Bands. He will be operating in the CQ WW DX CW Contest. CQ via LotW or EA5GL direct.

**VK9LQ Lord Howe Island** (OC-004), 21 – 27 November. Michael DF8AN will be operating 160 – 6 m, CW, SSB, FT8 and other digital modes. QSL via DF8AN bureau or direct.

**FW/M0JHQ Wallis & Futuna**, 23 – 27 November. JA0JHQ will be operating from Wallis Island (OC-054), on 160 – 10 m using CW and FT8. He may have a special callsign. QSL via LotW, or JA0JHQ direct.

**A35JP Tonga**, 24 November – mid November 2020. Masa JA0RQV will be working in Tongatapu Island (OC-049) as a resident supervisor of an international cooperation project. He will be active on 160 – 10 m in CW, SSB and FT8. He may also operate from the outer islands. QSL via LotW, or Club Log QRSS, or JA0RQV via the bureau. For more information see: <https://www.qrz.com/db/a35jp>

3D2AG/p **Rotuma** (OC-060), 28 November – 5 January. Tony 3D2AG will be visiting Rotuma again. He will be operating HF and 6 m bands, with a focus on 160 and 80 m, with CW, SSB, RTTY and FT8. QSL via Club Log OQRS. For his operating information see: <https://www.qrz.com/lookup/3d2ag/p>

**V6K Micronesia**, 2 – 9 December. Haru JA1XGI will be operating from Kosrae Island (OC-059), with a focus on 160 and 80 m in CW. QSL via JA1XGI. For more information see: <http://v6k.client.jp/>

**XT2AW Burkina Faso**, 2 – 20 December. Harald DF2WO will be operating from Ouagadougou, on HF bands, focusing on 160 and 80 m in CW, SSB, RTTY and FT8. QSL via M0OXO. For more information see: <https://www.qrz.com/db/xt2aw>

**TO9W St Martin** (NA-105), 4 – 13 December. FS4WBS, and K9NU, W9IILY, N9AOL and K9EL will be operating, on 160 – 6 m, with a focus on 160, 80 and 40 m mainly in CW and FT8. QSL via LotW. For more

information see: <http://k9el.com/SaintMartin2019/SXM2019.htm>

**6V1A Senegal**, 13 – 15 December. 6W7JX, 6W1PZ, 6W1KI, 6W1QL, 6W1PA, 6W1SQ, 6W1SV, 6W1GF and 6W1TA will be operating from Goree Island (AF-045). They will be on HF bands, in SSB and CW. QSL via LotW, or 6W1QL.

**HS0ZNR Thailand**, 14 December – 8 January. Brad VK2BY will be operating from Nam Yuen, Ubon Ratchathani on 80 – 10 m, using SSB and FT8. QSL via LotW. Logs will be uploaded to Club Log.

**ZC4UW Sovereign Bases Area, Cyprus**, 2 – 7 January. G3ZAY, M0BLF, M0VFC, G7VJR, M0ZX, G7SOZ, M0WUT and M0BBB will be operating 160 – 10 m in CW and SSB with four stations. QSL via LotW or Club Log OQRS. For more information see: <https://zc4uw.com/>

There are many other activities planned in a very busy season of DXpeditions, and these are just some of them. For a complete list visit

NG3K's "Announced DX Operations" website: <https://www.ng3k.com/misc/adxo.html>

## Other News

### 3Y0I Bouvet Island

The Rebel DX Group has resumed their plans to activate Bouvet Island, #1 Most Wanted entity in VK/ZL. Having expended large amounts of their own funds in the first attempt, they want this time to raise a minimum of US\$85,000 to cover their fuel costs for another attempt. They have initiated a GoFundMe campaign to enable fund raising. Hopefully they can get there this summer. For all information on the 3Y0I DXpedition see: <https://bouvetoya.org/3yoipreparations-resumed/>

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



**The Wireless Institute of Australia** ACN 004 920 745

## Election of Directors - Call for Nominations

Pursuant to clause 14.1 (c) of the Constitution the WIA Board has determined that the election of directors shall be conducted by postal ballot.

Two directors are due to retire at the next Annual General Meeting (AGM) which will be held in Hobart in May 2020, namely Aidan Mountford VK4APM and Dr Harry Edgar VK6YBZ. Each retiring director is eligible for re-election.

Nominations are called for from persons seeking election as a director of the WIA.

A director must be a voting member of the WIA and must hold an Australian amateur radio license. Directors are elected for a two year term.

**Any person wishing to be nominated as a candidate for election as director of the WIA must deliver or cause to be delivered to the Returning Officer by not later than 31 January 2020:**

*A nomination statement signed by the candidate signifying their willingness to be a candidate for election as a director; together with the full name, date-of-birth, occupation,*

*membership number and callsign of the candidate, and such other biographical details or other information as the candidate wishes to accompany the ballot papers, but in all not exceeding 250 words.*

A nomination form is printed on the reverse of the mailing sheet for this issue and will also be made available on the WIA web site.

Delivery to the Returning Officer may be made by hand when the WIA national office is open at:

Unit 20	or by mail to:
11-13 Havelock Road	PO Box 2042
Bayswater	Bayswater
Victoria 3153	Victoria 3153

Nominations received via email, facsimile or by other electronic means cannot be accepted.

**John Marshall**

WIA Returning Officer  
October 25, 2019



# VK2 news

Tim Mills VK2ZTM  
e [vk2ztm@wia.org.au](mailto:vk2ztm@wia.org.au)

**Seasons Greetings.** It has come to that time in the yearly cycle where many clubs will not have meetings in either or both December and January and defer the start of next year to February 2020. VK2WI News will become morning only on Sunday December 29th and January the 5th and the 12th. The evening bulletins resumes on the 20th January 2020. The first of the 2020 Trash & Treasure will be on January 26th. The March T&T will be on the 29th; May 31st; July 26th; September the 27th and November the 29th.

The first of the five ARNSW Foundation and assessment weekends will commence on March the 14th and 15th; then May the 16th and 17th; July the 11th and 12th; September the 12th and 13th and November the 14th and 15th.

The Wyong Field Day is scheduled for Sunday the 25th of February. Subject to confirmation.

The Illawarra A R S have gone back to their former meeting location at the Blue Scope Steel Visitors Centre located on Springhill Road on the southern side of the Wollongong CBD.

The Monopole at ARNSW saw the antennas installed late September, the feed cables installed early October and the VHF and

UHF repeaters transferred and connected late October. There has been mixed results but in general some improvement. These notes were written as the transfer was taking place - more time will be needed to assess the final outcome. The beacons have not moved and will be transferred to a new mount later. Once moved, the beacons may exhibit altered coverage patterns. News on progress will be given on VK2WI News and ARNSW Face Book, ALL ACCESS and these VK2 NEWS notes.. These are the official news sources for ARNSW. Other sources are best branded Fake News. There will be the 3 rd edition of ALL ACCESS out towards the end of November to remind you about the last Trash & Treasure for the year.

Do you find there are occasions when you would like to get out in a park or other open location where you would like to play a little Radio. But there are members of the public with their attitude towards 5G and other miss guided opinions on the electronic world that you feel concerned for your safety. Well ARNSW has found a solution. For a while a small group has been gathering in the VK2WI Dural groups to experiment and play radio. There is a bit of local interference

from other on site HF and UHF transmissions. Recently a picnic type shelter has been constructed which could well be a 'Contest House'. Any member interested in using the facility should make arrangements with the Secretary by emailing [secretary@arnsw.org.au](mailto:secretary@arnsw.org.au)

Around VK2 there is a lot of activity. Looking at some of the club newsletters we note there is a lot of work being carried out on the Summerland ARC network of repeaters. Their November training class for all license grades was oversubscribed. The Armidale & District ARC have been doing a lot work on linking the New England repeaters into a network. Oxley Region ARC are working on a new repeater site for their VK2RCN network after the lease arrangement on the existing site were winding down. Great Lakes RC meet at the studios of the Community radio station in Tuncurry. They support repeaters VK2RGL on 2 metres and 70 cm. They maintain a Face Book site advises Secretary Andy VK2AAK. Details of some 40 VK2 clubs are on the Radio Club listing on both the WIA and ARNSW club directory, some of which are in need of upgrade. All the best of the festive season and see you in January 2020 when you will be able to see 2020. 73 – Tim VK2ZTM



## 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/>

# WIA Conference Weekend | 8-10 May 2020



The weekend starts **Friday morning** with 30 lucky attendees getting a guided tour of the Australian Antarctic Division at Kingston. There will be an informal dinner Friday night at a popular Hobart location.

**Saturday** will see the AGM and Open Forum before lunch then two streams of Presentations covering Antarctic management, research, medicine, weather, radio and many amateur radio activities. Partners will be treated to the huge Salamanca Markets and the Museum of Old and New Art (MONA).



**Sunday** is a full day of tours including the Mawson's Replica Hut Museum, Tasmanian Museum and Art Gallery - Islands to Ice, Tasmanian Maritime Museum and the Grote Reber (Radio Astronomy) Museum and 29 m Radio Telescope.

## ANTARCTIC GATEWAY THEME IN HOBART TASMANIA



**Saturday** night will be the **Conference Dinner** with a fantastic keynote speaker.

The finale of the weekend will be a BBQ at the historic Coast Wireless Station that was used by the Mawson Expedition to receive news from the icy continent via spark transmission. This includes tours of the Tasmania Maritime Radio monitoring station and maritime radio museum.

The weekend headquarters will be at the Best Western Hotel in Bathurst St Hobart and we have been able to secure a great room deal. To book call **(03) 623 262 43** or emailing *reservations97434@bestwestern.com.au* and quoting WIA to receive a \$149 discounted room rate.

There are many accommodation options at the WIA website. See URL below.

For more information and to book for the conference go to: <https://www.wia.org.au/joinwia/wia/2020agm/>

Look forward to seeing you there.

73, Justin, VK7TW



# Hamfest 2020

Sunday 16th February  
Italian Sports Club of Werribee  
601 Heaths Rd, Werribee VIC 3030



Tables are available at \$20.00 each includes  
1 entry please contact Andy Kay VK3VKT  
on 0409 160 948 or [vk3vkt@gmail.com](mailto:vk3vkt@gmail.com)

- \* **HUGE VENUE \* HEAPS OF PARKING**
- \* **MAJOR AND MINOR DOOR PRIZES**
- \* **ALL UNDERCOVER AND INDOORS**
- \* **FOOD SUPPLIED FROM 9AM**
- \* **FREE TEA AND COFFEE**

\* **THE ONLY WESTERN SUBURBS HAMFEST**

**Entry is only \$7.00**

(Doors open from 10 am  
entry tickets will be on sale  
from 9 am)

"ticket includes one free  
draw in the major prize"  
extra tickets available for  
purchase.

Call in on **VK3RGL 147.000**  
**tone 91.5 or 145.245 Simplex**

Icom, Tet Emtron, South East Comms and many more attending with tables full of gear to see

## 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 439.825 MHz IRLP node 6278, EchoLink node 399996

#### In Tasmania

VK7RTV 2 m. Repeater Stowport 146.775 MHz. IRLP 6616

#### In the Northern Territory

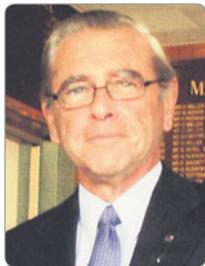
VK8MA, Katherine on 146.750, CTCSS 91.5, IRLP Node 6800

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 S0-50 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.



# VK3 news Geelong Amateur Radio Club

Tony Collis VK3JGC

## ILLW

The club operated the **ILLWeekend**, adjacent to the **Point Lonsdale Lighthouse**, pictured below.

Whilst Point Lonsdale light is automatic these days and no longer needs a light keeper, the linkup will be made by members of the Geelong Amateur Radio Club broadcasting from the **Point Lonsdale Boardriders clubhouse** located below the Lighthouse.

Prior to the ILLW Ken VK3DQW had visited the Point Lonsdale lighthouse and built dipole antennas for 20 & 40 meters and a vertical for 160m, which saved a lot of preparation time .

All that had to be done on the Saturday was to set up and start the generator and hook up the rigs, as a result contacts were being made about 30 minutes after arriving.

Those GARC members that participated were Graeme VK3GYM, George VK3AGL, Ken VK3DQW, Bert VK3TU, Robert VK3FAAS, Lee VK3PK and Ian VK3BFR

Two local amateurs came to watch proceedings Phil VK3JWL and Darryl VK3NIC



Photo 1: The Point Lonsdale Board Riders operational centre.

In all over 40 ILLW contacts were made; distributed amongst VK2, VK3, VK5 and VK7 along with a couple of ZL2's. Thirty of the contacts were made on 40m , nine on 20m and two on 160m.

The ILLW also coincided with the *Remembrance Day Contest* that resulted in around 20 contacts with VK2, VK3, VK4, VK5 and VK6; most of which were on 40m with three on 20m.

## The New GARC Defibrillator

After several weeks of due diligence Barry VK3SY, the GARC Welfare Officer, selected the AED from Taleb Enterprises Pty Ltd at Tullermarine who offered the GARC the unit, shown below, complete with a user first aid kit and a wall housing cabinet for under \$ 2,000.

Gavan Byrne , from Taleb Medical, provided a 20 minute presentation to the members attending a Wednesday Meeting giving a clear and informative presentation on its application to any club member that might suffer a heart attack. As indicated in the July / August VK3 column

Sudden Cardiac Arrest (**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



Photo 2: Barry VK3SY with Gavan from Taleb Medical.

SCA with a clear bias towards Males rather 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

## The 2018 Oceania Award

Just received, prior to the 2019 contest, the seventh consecutive Annual Plaque awarded to the Geelong Amateur Radio Club for its members participation in the 2018 Oceania DX Contest.



Photo 3: The Oceania VK Club Award.



# ALARA

Jenny Wardrop VK3WQ

## ALARA Contest 2019

Unfortunately, for the first time in many years I was unable to participate in the ALARA contest this year. However, congratulations to the winners in their various categories, and here are the results with a preface by our Contest Manager, Marilyn VK5DMS

It was great to have all the logs arrive by email this year – no waiting on snail mail to make the deadline! Again we must thank all those OMs who gave the girls points, even if they didn't put in a log. Congratulations to Sue VK5AYL who worked hard to achieve her first ever contest and took top points! I'm sure her OM Richard kept up her sustenance throughout – thank you Richard.

It was also great to see more use being made of EchoLink this year as conditions have not improved very much on HF. Michelle VK2FMYL made a good score on this medium and I hope more use will be made next year. Six girls made use of EchoLink this year. Lyn VK4SWE also made a good score on CW. So now its time to look forward to another contest next year. Thank you everyone for taking part and supporting ALARA.

33 Marilyn VK5DMS

Here are the 2019 ALARA Contest results:

Sue VK5AYL 555 Top overall, Top phone, Top VK5 ALARA member

Linda VK7QP 502 Top VK7 ALARA member

Catherine VK7GH 249

Leonie VK2LDM 127 Top VK2 ALARA member

Michelle VKL2FMYL 77 Top

Foundation licence ALARA member, Top Echolink

Lyn VK4SWE 72 Top VK YL CW, Top VK4 ALARA member

Andrew VK3LTL 70 Top VK3 OM

Dot VK2DB 50

Ngaire ZL2VJT 46 Top DX YL ALARA member

Bryan VK3BWM 40

Rhoderick VK2TTL 35 Top VK2 OM

Neil VK3NM 35

Paula VK8ZI 28 Top VK8 ALARA member

Norma VK2YL 23

Derek VK3DEK 20

Lesley VK5LOL 16

Bev VK6DE 15 Top VK6 ALARA member

Graeme VK6MIL 10 Top VK6 OM

Kim VK3FMIK 10

Graeme ZL2APV 10 Top DX OM

Elizabeth VK2XSE 10

## SUMMARY

ALARA members 13 (inc. 1 DX member)

Oms 8 (inc. 1 DX member)

## Now for something quite different!

I attended the WIA AGM in Sydney earlier this year, as did a number of ALARA ladies. A pleasant surprise to me was the guest speaker at the Friday night Dinner. I should add here that all of the speakers that weekend were well chosen, very entertaining and extremely informative. It was a great night held in the Marconi Room of the Sydney Town Hall. But the Friday night speaker in particular, very quickly

got my attention. He was an author and had recently released his latest book, *The Secret Code-Breakers of Central Bureau*.

A few years ago, I was able to participate in the BYLARA organised, International Y/L meet in the UK, held at Milton Keynes, and of course we all visited nearby Bletchley Park - a fascinating place, full of tantalising radio history and of course, the home of the UK WWII code breaking activities. So when the "Central Bureau" was mentioned, I like many others assumed it was something to do with Bletchley Park.

Wrong! It was Australian - our own sophisticated signals intelligence network, which was particularly involved with the Pacific area, tracking the Japanese and untangling their coded messages. The author, Dr. David Duffy, made a very interesting presentation that night, including dwelling for some time on the subject of Florence McKenzie and the important part she played in the training of lady operators, many of whom in turn, filled important positions in the ensuing war years. Towards the end of his presentation, David went onto tell the assembled throng that he was working on another book, specifically about "Mrs. Mac.". Wonderful, some good professional research is being done about one of our "heroes"!

We have asked David to consider addressing the ALARA Meet 2020 in Bendigo next year and hopefully his latest book will be available by then. So watch this space.

Returning briefly to David's Code Breakers book. It has a



Photo 1: Raising the aerial with the tractor and pole.

complete chapter about Mrs. Mac. and her girls in green, and she pops up in various places through the book (which I'm still reading). One example is on page 75, where he states "And, of course, Newman had discovered an untapped well of signals talent and expertise through Mrs. Mac's Women's Emergency Signaling Corps". Jack Newman was a key organiser in the establishment of an Australian cryptographic organisation.

David's book, *The Secret Code-Breakers of Central Bureau – how Australia's signals-intelligence network helped win the Pacific War*, is published by Scribe, contains 451 pages, and is very interesting. It is well referenced and indexed and is an easy read. Perhaps a worthwhile last minute Christmas present for the OM – then you can borrow it to read! And stay tuned for news of David's Florence McKenzie book.

## New QTH in VK7

From Catherine VK7GH

After a radio hiatus for 3 years, we have finally moved into our new QTH in VK7. First of all, though, was giving up my call sign VK4GH and obtaining VK7GH. My OM also obtained his call sign of VK7IO.

Scouring the ads in Gumtree is an obsession for John, and a couple of very long poles came up nearby. So off he went with the car trailer to collect. We had decided to put up the pole and TH6 antenna that we brought down from Queensland. We also decided that the Nally tower was going

to be in another part of the yard next to another shed. In order for the tower to be tilted over, some trees had to be removed, a lean-to on the shed demolished and all this before the new house yard fence was to be put up, in order for the concrete truck to come into the yard. So, one thing led to another, and none of the tree removal could start until the rain began in April and the fire bans lifted.



Photo 2: The erected aerial.

The auger bits that John had bought for the tractor, his new prized possession, came in handy for drilling down to put the pole in and also for the Nally tower base. The pole was also to be the corner post for the replacement wood shed. Finally, the day came to raise the pole. Slings around the pole and lifting it with the tractor bucket got it up so high, but it was rather wobbly and precarious.

After some thought, and various bracing ropes, the winch on the 4WD was used to raise it further until it suddenly slid down into the hole.

After the metal tower was attached to the pole, we then had to tilt that over and put the antenna in the end. Only a ladder and some brute strength from the two of us was required for this, no photos unfortunately, I was too busy helping.

Luckily, one of our neighbours owns a good sized cherry picker, so that made it very easy to go up and make all the final adjustments for the TH6. So now we have a working antenna on 20, 15 & 10m.

Unfortunately I will not have a beam for 40m until some time next year, as the SteppIR needs some small repairs, after its trip down in the container, it also has some sun damage. There are also some good sized gum trees around, so the 160m loop was easy to put back up, and works well on 80m and tunes quite well on 40m.

I'm slowly getting back my radio setup, in order to enjoy those contests and DX.

## ALAR Grants now open

If you have been thinking about getting a licence, or upgrading your licence from Foundation to Standard or Advanced, now is a good time to do it.

ALAR is making available a limited number of grants

to cover half the costs of upgrading your licence.

Details are available on the website <https://alara.org.au/>

We look forward to receiving your application.

### A very poignant VK3 lunch

On Saturday 28<sup>th</sup> September, the VK3 ladies held their usual bi-monthly lunch. This one, at the Braybrook Hotel, was to have been organised by Kaye VK3FKDW, but due to ill health she was unable to do it. Kaye has also had to step down as our ALARA Newsletter Editor and from the position of Secretary to the WIA's Publication's Committee. It had been decided that we should present Kaye with a Certificate of Appreciation for her work as Newsletter Editor, and I'm happy to report that she was well enough to attend and receive it. It was a somewhat emotional presentation for most of



Photo 3: Kaye VK3FKDW.

us, not least Kaye. Jean VK3VIP also presented Kaye with an arrangement of flowers in a box, and a card which we had all signed.

I would also like to thank our Contest and Awards Manager,

Marilyn VK5DMS for organising the Certificate of Appreciation and to Tina VK5TMC for filling in as a temporary Newsletter Editor, at short notice.

### 2020 ALARAMEET

Plans for the 2020 ALARAMEET on 2nd - 5th October are progressing. While we realize it is almost a year away, an estimate of numbers would greatly assist the organizing committee. If you think you might be able to attend, please email Tina at [editor@alara.org.au](mailto:editor@alara.org.au) with the number in your party. For more details on the sort of activities we are planning, please go to our website at [alara.org.au](https://alara.org.au)

As this will be the last column before Christmas, I would like to wish you and your families a safe and happy Christmas and may Santa leave you that special piece of "gear" that you have been hoping for. 33, Jen VK3WQ



## REDFEST 2020 18th April

Greetings from the Redcliffe & Districts Radio Club.

Right here in South East Queensland!

We, at the Redcliffe & Districts Radio Club, will hold our Hamfest on:

**Saturday the 18th April 2020 at 9:00am.**

**Please mark the date in the calendar on your mobile phone.**

You'll find us at St. Michael's College, Caboolture. On the Bruce Highway, take Exit 152 and then Bribie Island Rd. Turn left at Old Toorbul Point Rd. St Michael's College is well sign posted on the right.

RF Solutions will be there. We'll have a door prize raffle and we'll raffle a Handheld. Also there will be **working demonstrations**, of the **ingenuity and activities** of club members.

**BREAKFAST** is served from 8:00am. REDFEST opens at 9:00am.

We'll start selling tables next March.

For more info go to: <http://www.redclifferadioclub.org.au/>

# VK3 news Amateur Radio Victoria

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

The 9<sup>th</sup> Annual Keith Roget Memorial National Parks Award activation period, held in November, was again successful in providing Hunters and Activators valuable contacts towards achieving Award contacts.

Supporting the event was keen Satellite exponent, **David, VK5DG**. David travelled to the East Gippsland region to activate several more VK3 eligible Parks as he worked towards activating all 45 VK3 National Parks by Satellite. David will be the first ever to achieve a Satellite Endorsement in the KRMNPA program. The attached photo, taken at an earlier successful activation in the Gunbower National Park, shows David setting up on the banks of the Murray River prior to an upcoming Satellite pass. The Antenna is an ELK log periodic feeding a duplexer and 2m Pre-Amp. The rigs on this occasion are the old faithful TS-811 and the FT -817.

Other Amateurs joined in the event, activating various National Parks across Victoria. A full 2019 Activation period report can be found on the ARV website, along with the simple rules and guidelines. [www.amateurradio.com.au](http://www.amateurradio.com.au)

The 10th Activation Period will be held across 4 Days in 2020.

**Friday November 6 – Monday November 9.** Mark your diaries now and get involved in 2020!

## ARV Homebrew Group

The Homebrew Construction Group of Amateur Radio Victoria aims to promote the good fellowship

and exchange of ideas between amateurs who are enthusiastic builders of their own equipment. It does this through monthly meetings in the A.R.V rooms located at 40g Victory Blvd., Ashburton on the first Saturday of each month (excluding January), at 2.00pm.

The meetings are generally very informal but commence with a "Show and Tell" session where projects can be displayed and described. The following discussion usually generates a wealth of ideas for the new comer and experienced constructor alike. The session is followed by a guest speaker, when possible.

Homebrewing encompasses almost every aspect of our hobby and those who might not necessarily regard themselves as dedicated homebrewers will find something of interest in this group.

The final 2019 meeting date is Saturday 7th December.

Contact Rob: [vk3mq@amateurradio.com.au](mailto:vk3mq@amateurradio.com.au)

## ILLW 2020

Following a successful 2019 ILLW event, Amateur Radio Victoria have again registered the Williamstown Time Ball Tower (AU0036) for the International Lighthouse and Lightship weekend (ILLW2020) to be held across 2 days, August 22- August 23 2020. At the time of writing 64 Stations have registered worldwide for 2020, with 12 of those stations being VK. The ILLW is a great fun event and all ARV Members are encouraged to participate again during 2020.

More details in later editions of this column. <https://illw.net/index.php>

## HMAS Castlemaine activities

Amateur Radio Victoria members, (with the support of the HMAS Castlemaine Volunteers) have been active on several occasions during 2019 from the "Bridge" of the museum ship HMAS Castlemaine. The ship is moored at Gem Pier, Williamstown and opens the gangway to the Public at 1100 -1600 on weekends and public holidays. A small interactive display, focusing on promoting Amateur Radio & Marine radio in general is set up on selected dates, in the large wheelhouse area, and is used to engage families, albeit briefly, to the role of Radio in its many facets. ARV members promote CW, with active hands on demos and the use of Phonetics in the Radio environment, to the many visitors passing through. The interaction and Radio display is proving very popular amongst all visitors - Young and Old!

ARV intends to expand this successful promotional program onboard the HMAS Castlemaine in 2020, by adding a few extra days over the year. <http://hmascastlemaine.org.au>

## Log Books

Many amateurs still prefer the "old style" paper Log Books: The Amateur Radio Victoria web shop is the place to visit to secure yours!

Visit [www.amateurradio.com.au/](http://www.amateurradio.com.au/) and click on "shop"



Operate within the band plans:

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



# WIA Awards

Marc Hillman VK3OHM/VK3IP

Below are listed all New awards issued from 2019-08-15 to 2019-10-14, plus all updates to DXCC awards.

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

## New awards

### 2017 AGM

#	Call	Name	Category
33	VK7DW	Andrew Martin de Water	General Award

### Antarctic

#	Call	Name	Mode
110	VK5BC	Brian Cleland	Open
111	WL7CG	Alan Sorum	Open
112	WL7CG	Alan Sorum	Digital
113	VK4CAG	Graeme Dowse	Digital

### DXCC Multi-band (7)

#	Call	Name	Mode	Band	Count
43	VK6RZ	Peter Drew	Open	40-30-20-17-15-12-10m	1361

### DXCC Multi-band (3)

#	Call	Name	Mode	Band	Count
143	VK3MH	Brendan Bryant	Open	40-30-20m	409
144	VK3AWG	Christopher Bellmont	Digital	40-20-17m	413
145	VK3MH	Brendan Bryant	Digital	40-30-20m	376

### DXCC Multi-band (5)

#	Call	Name	Mode	Band	Count
100	VK3AWG	Christopher Bellmont	Digital	40-30-20-17-15m	616
101	DD0VU	Jens Knoepchen	Digital	80-40-30-20-17m	626
102	VK6RZ	Peter Drew	Open	40-30-20-17-15m	1156
103	VK6RZ	Peter Drew	CW	40-30-20-17-15m	1073

### DXCC Multi-band (1)

#	Call	Name	Mode	Band	Count
223	VK3FN	Peter Dernikos	Open	20m	100
224	VK3QI	Peter Forbes	Open	20m	340
225	VK3QI	Peter Forbes	CW	30m	327
226	VK3HJ	Luke Steele	Digital	20m	122
227	VK3GWS	Grant Smith	Open	20m	145
228	VK3GWS	Grant Smith	Digital	20m	122
229	VK6RZ	Peter Drew	Digital	40m	108

### DXCC Multi-mode (Digital)

#	Call	Name	Count
90	VK5SA	Chris Livingston	120
91	VK3FN	Peter Dernikos	107
92	VK3BOY	Phillip Vis	100
93	VK6AS	Andrew Smith	106
94	VK3GQ	Peter Carew	102
95	VK3MB	Philip White	148
96	VK3GWS	Grant Smith	142
97	VK6RZ	Peter Drew	165
98	VK2MIX	Adam McCarthy	117

### DXCC Multi-mode (Open)

#	Call	Name	Count
476	VK3FN	Peter Dernikos	126
477	VK3BOY	Phillip Vis	100
478	VK6AS	Andrew Smith	107
479	VK3MB	Philip White	152
480	VK3GWS	Grant Smith	168
481	VK4HAT	Rob Powell	104
482	VK2MIX	Adam McCarthy	126

### Grid Square

#	Call	Name	Mode	Band	Count
398	VK3FN	Peter Dernikos	Open	HF	707
399	VK3FN	Peter Dernikos	Digital	HF	658
400	VK7DW	Andrew Martin de Water	Open	HF	100
401	VK7DW	Andrew Martin de Water	Phone	HF	100
402	VK7DW	Andrew Martin de Water	Digital	HF	100
403	VK3MB	Philip White	Open	HF	100
404	VK3MB	Philip White	Digital	HF	100
405	VK5NNN	Ivan VUJIC	Digital	HF	100
406	VK3GWS	Grant Smith	Open	HF	100
407	VK3GWS	Grant Smith	Phone	HF	100
408	VK3GWS	Grant Smith	Digital	HF	100

### Islands of Australia

#	Call	Name	Count
1	VK3OHM	Marc Hillman	30
2	VK3GA	Graham Alston	35
3	VK3EW	David McAulay	32
4	VK3FZ	Roger Stafford	22
5	VK7CW	Steven Salvia	51
6	VK3QI	Peter Forbes	55
7	VK3KTT	Steven Barr	37
8	VK3SIM	Simon Keane	31
9	VK3AWG	Christopher Bellmont	21
10	VK3HJ	Luke Steele	40
11	VK4CAG	Graeme Dowse	35

### DXCC Multi-band (9)

#	Call	Name	Mode	Band	Count
21	VK4CAG	Graeme Dowse	Open	160-80-40-30-20-17-15-12-10m	1712

## Worked All VK Call Areas HF

#	Call	Name	Mode
2393	AH6FX	Danny Jamison	Open
2394	VK3MH	Brendan Bryant	Open

## DXCC updates

### DXCC Multi-band (1)

#	Call	Name	Mode	Band	Count
31	VK3HJ	Luke Steele	CW	30m	289
43	VK7CW	Steven Salvia	CW	20m	282
79	VK6RZ	Peter Drew	CW	40m	315
97	VK6WX	Wesley Beck	CW	20m	153
201	VK3SIM	Simon Keane	CW	20m	162
219	VK3KTT	Steven Barr	CW	20m	102
54	VK3EW	David McAulay	Digital	20m	231
106	VK3SIM	Simon Keane	Digital	20m	200
162	VK3AWG	Christopher Bellmont	Digital	20m	190
164	VK5BC	Brian Cleland	Digital	20m	177
175	VK3JLS	John Seamons	Digital	20m	140
185	VK2BYI	Christopher Fredericks	Digital	20m	179
190	VK3BDX	David Burden	Digital	40m	211
221	VK3MH	Brendan Bryant	Digital	20m	145
13	VK2VEL	Edwin Lowe	Open	20m	138
17	VK6WX	Wesley Beck	Open	20m	229
29	VK3HJ	Luke Steele	Open	20m	313
34	VK3KTT	Steven Barr	Open	20m	242
76	VK3JLS	John Seamons	Open	20m	225
77	VK6RZ	Peter Drew	Open	40m	319
108	VK3AWG	Christopher Bellmont	Open	20m	239
143	VK2BYI	Christopher Fredericks	Open	20m	188
189	VK3BDX	David Burden	Open	40m	221
212	DD0VU	Jens Knoepchen	Open	40m	164
215	VK3MH	Brendan Bryant	Open	20m	167
30	VK3HJ	Luke Steele	Phone	20m	238
35	VK3KTT	Steven Barr	Phone	20m	214
78	VK6RZ	Peter Drew	Phone	40m	199
105	VK3SIM	Simon Keane	Phone	20m	190
107	VK3AWG	Christopher Bellmont	Phone	20m	162
169	VK3JLS	John Seamons	Phone	20m	205

### DXCC Multi-band (7)

#	Call	Name	Mode	Band	Count
10	VK3EW	David McAulay	CW	80-40-30-20-17-15-12m	1826
12	VK3HJ	Luke Steele	CW	40-30-20-17-15-12-10m	1633
14	VK7CW	Steven Salvia	CW	40-30-20-17-15-12-10m	1548
19	VK3QI	Peter Forbes	CW	80-40-30-20-17-15-12m	1501
11	VK3HJ	Luke Steele	Open	40-30-20-17-15-12-10m	1823
15	VK7CW	Steven Salvia	Open	40-30-20-17-15-12-10m	1635
35	VK3FZ	Roger Stafford	Open	40-30-20-17-15-12-10m	1174
41	VK3SIM	Simon Keane	Open	40-30-20-17-15-12-10m	1294

## DXCC Multi-band (3)

#	Call	Name	Mode	Band	Count
24	VK3EW	David McAulay	CW	30-20-17m	906
29	VK3HJ	Luke Steele	CW	40-30-20m	812
37	VK7CW	Steven Salvia	CW	30-20-17m	775
47	VK3QI	Peter Forbes	CW	40-30-12m	793
58	VK6RZ	Peter Drew	CW	40-30-20m	789
66	VK3EW	David McAulay	Digital	40-30-20m	625
104	VK5BC	Brian Cleland	Digital	40-30-20m	499
121	VK3GA	Graham Alston	Digital	40-30-20m	551
123	VK5DG	David Giles	Digital	30-20-17m	333
125	VK3SIM	Simon Keane	Digital	40-30-20m	537
132	VK3BDX	David Burden	Digital	40-30-20m	613
136	DD0VU	Jens Knoepchen	Digital	40-30-20m	402
144	VK3AWG	Christopher Bellmont	Digital	40-20-17m	413
145	VK3MH	Brendan Bryant	Digital	40-30-20m	376
27	VK3HJ	Luke Steele	Open	40-30-20m	883
36	VK7CW	Steven Salvia	Open	30-20-17m	814
42	VK5DG	David Giles	Open	30-20-15m	404
57	VK6RZ	Peter Drew	Open	40-30-20m	833
67	VK3SIM	Simon Keane	Open	40-30-20m	669
69	VK3KTT	Steven Barr	Open	20-15-10m	580
112	VK6WX	Wesley Beck	Open	40-20-15m	541
119	VK3JLS	John Seamons	Open	20-17-15m	443
126	VK3AWG	Christopher Bellmont	Open	20-17-15m	542
131	VK3BDX	David Burden	Open	40-30-20m	634
135	DD0VU	Jens Knoepchen	Open	40-30-20m	433
143	VK3MH	Brendan Bryant	Open	40-30-20m	409
28	VK3HJ	Luke Steele	Phone	40-20-15m	556
68	VK3KTT	Steven Barr	Phone	20-15-10m	518
124	VK3SIM	Simon Keane	Phone	20-15-10m	401

### DXCC Multi-band (5)

#	Call	Name	Mode	Band	Count
17	VK3HJ	Luke Steele	CW	40-30-20-17-15m	1272
21	VK3EW	David McAulay	CW	40-30-20-17-15m	1418
35	VK7CW	Steven Salvia	CW	40-30-20-17-15m	1188
39	VK3QI	Peter Forbes	CW	40-30-20-17-12m	1195
79	VK3EW	David McAulay	Digital	40-30-20-17-15m	959
89	VK3SIM	Simon Keane	Digital	40-30-20-17-15m	803
92	VK3GA	Graham Alston	Digital	40-30-20-17-15m	816
96	VK3BDX	David Burden	Digital	80-40-30-20-17m	892
100	VK3AWG	Christopher Bellmont	Digital	40-30-20-17-15m	616
16	VK3HJ	Luke Steele	Open	40-30-20-17-15m	1402
34	VK7CW	Steven Salvia	Open	40-30-20-17-15m	1251
48	VK3SIM	Simon Keane	Open	40-30-20-17-15m	1044
72	VK3FZ	Roger Stafford	Open	30-20-15-12-10m	907
84	VK5DG	David Giles	Open	30-20-17-15-10m	615
93	VK3AWG	Christopher Bellmont	Open	40-30-20-17-15m	788
94	VK3BDX	David Burden	Open	80-40-30-20-17m	920
98	VK6WX	Wesley Beck	Open	40-30-20-17-15m	787
45	VK3HJ	Luke Steele	Phone	40-20-17-15-10m	811

## DXCC Multi-band (9)

#	Call	Name	Mode	Band	Count
12	VK3EW	David McAulay	CW	160-80-40-30-20-17-15-12-10m	2163
14	VK3QI	Peter Forbes	CW	160-80-40-30-20-17-15-12-10m	1733
15	VK3HJ	Luke Steele	CW	160-80-40-30-20-17-15-12-10m	1919
1	VK3EW	David McAulay	Open	160-80-40-30-20-17-15-12-10m	2815
4	VK3QI	Peter Forbes	Open	160-80-40-30-20-17-15-12-10m	2631
13	VK3HJ	Luke Steele	Open	160-80-40-30-20-17-15-12-10m	2137

## DXCC Multi-mode (CW)

#	Call	Name	Count
212	VK3HJ	Luke Steele	319
223	VK6WX	Wesley Beck	222
233	VK3SIM	Simon Keane	229
234	VK3KTT	Steven Barr	166
245	VK4CAG	Graeme Dowse	179
249	VK3FZ	Roger Stafford	232
257	VK3AWG	Christopher Bellmont	149

## DXCC Multi-mode (Digital)

#	Call	Name	Count
25	VK30HM	Marc Hillman	200
27	VK3HJ	Luke Steele	217
40	VK3SIM	Simon Keane	244
47	VK3AWG	Christopher Bellmont	220
55	VK3GA	Graham Alston	253
56	VK2BYI	Christopher Fredericks	187
65	VK3FZ	Roger Stafford	160
66	VK3JLS	John Seamons	149
67	VK4CAG	Graeme Dowse	222
71	VK3BDX	David Burden	241
79	VK3KTT	Steven Barr	155
82	VK6WX	Wesley Beck	133
85	VK3MH	Brendan Bryant	175
96	VK3GWS	Grant Smith	142

## DXCC Multi-mode (Open)

#	Call	Name	Count
342	VK2VEL	Edwin Lowe	154
370	VK3KTT	Steven Barr	279
394	VK3JLS	John Seamons	245
397	VK3AWG	Christopher Bellmont	276
413	VK3WE	Rhett Donnan	175
419	VK3GA	Graham Alston	320
423	VK3SIM	Simon Keane	297
440	VK2BYI	Christopher Fredericks	197
451	VK3FZ	Roger Stafford	313
458	VK3BDX	David Burden	254
470	VK3MH	Brendan Bryant	202
480	VK3GWS	Grant Smith	168

## DXCC Multi-mode (Phone)

#	Call	Name	Count
507	VK6RZ	Peter Drew	265
549	VK2VEL	Edwin Lowe	138
575	VK3KTT	Steven Barr	257
579	VK3HJ	Luke Steele	294
587	VK3JLS	John Seamons	226
601	VK3SIM	Simon Keane	234
602	VK3AWG	Christopher Bellmont	203
624	VK5SA	Chris Livingston	114
626	VK3BDX	David Burden	125
628	VK3MH	Brendan Bryant	133

## Grid Square

#	Call	Name	Mode	Band	Count
76	VK3EW	David McAulay	CW	HF	650
103	VK7CW	Steven Salvia	CW	HF	1728
174	VK3SIM	Simon Keane	CW	HF	548
177	VK3KTT	Steven Barr	CW	HF	255
223	VK3GA	Graham Alston	CW	HF	421
339	VK3AWG	Christopher Bellmont	CW	HF	173
393	VK3BDX	David Burden	CW	HF	156
59	VK30HM	Marc Hillman	Digital	HF	719
77	VK3EW	David McAulay	Digital	HF	1190
104	VK7CW	Steven Salvia	Digital	HF	265
108	VK1DI	Ian Sinclair	Digital	HF	432
110	VK3AWG	Christopher Bellmont	Digital	HF	1091
175	VK3SIM	Simon Keane	Digital	HF	1386
257	VK3GA	Graham Alston	Digital	HF	832
301	VK3BDX	David Burden	Digital	HF	1337
353	VK3GQ	Peter Carew	Digital	HF	501
362	VK3ZZX	Oscar Reyes	Digital	HF	243
370	VK3KTT	Steven Barr	Digital	HF	493
399	VK3FN	Peter Dernikos	Digital	HF	658
50	VK30HM	Marc Hillman	Open	HF	958
74	VK3EW	David McAulay	Open	HF	1686
84	VK3KTT	Steven Barr	Open	HF	1094
101	VK7CW	Steven Salvia	Open	HF	1861
107	VK1DI	Ian Sinclair	Open	HF	459
109	VK3AWG	Christopher Bellmont	Open	HF	1269
172	VK3SIM	Simon Keane	Open	HF	1637
221	VK3GA	Graham Alston	Open	HF	1049
300	VK3BDX	David Burden	Open	HF	1395
352	VK3GQ	Peter Carew	Open	HF	504
361	VK3ZZX	Oscar Reyes	Open	HF	243
398	VK3FN	Peter Dernikos	Open	HF	707
58	VK30HM	Marc Hillman	Phone	HF	456
75	VK3EW	David McAulay	Phone	HF	1267
85	VK3KTT	Steven Barr	Phone	HF	853
102	VK7CW	Steven Salvia	Phone	HF	665
173	VK3SIM	Simon Keane	Phone	HF	731
176	VK3AWG	Christopher Bellmont	Phone	HF	422
222	VK3GA	Graham Alston	Phone	HF	323
363	VK3BDX	David Burden	Phone	HF	338

## Northern Corridor Radio Group

Its been a reasonably active time for the NCRG.

Results for the RD came out which had us 2<sup>nd</sup> in the MM section and 10<sup>th</sup> overall.

Work on the Contest station was ongoing. Our main focus now is getting it documented better so we can understand what we have and plan the next steps. We have a good single transmitter set up but need to improve our multi transmitter capability.

Plans are underway for our annual Christmas Party at the Henley in early December.

The standard and advance training course run by Cedric and Phil is nearing completion, so we are expecting to report a few new callsigns by the next club news edition.

We also experimented with a second remote station, but this has been shelved for the time being.

By the time this edition is out, our annual car boot sale will have been and gone so more on that next edition.

NCRG hosted JOTA once again this year with well over 100 scouts attending and not only operating the radios but also enjoying the other facilities of the club, camping overnight and participating in a few other scouting activities.

## Ham College

Ham College held its AGM in September but failed to reach a quorum. A second attempt was made in October and we were able to form a committee. The committee formed consisted of Steve Kennedy 6SJ – President, John Breen 6FB – Treasurer, Colin Riley 6XTL – Secretary, Adam Binneweg – Enrolments Officer, and committee members Karl Brady 6MYS, Sarfraz

Khokhar 6KHO and Kathi Sumner 6KTS.

What I think harmed us significantly were the comments made by an eastern states located ham who came across to run VE exams and made very public and disparaging remarks over Ham College cancelling one Foundation course that only had a single nomination. Ham College has been running foundation courses since its inception, beginning initially with monthly courses and then bi monthly courses as the initial interest waned. This is a significant burden on a few of our members, with some having been continuously doing the course since 2007. It's a rare occurrence for us to cancel a course and we run exams for all classes of license for 50-100 people each year. The comments left such a bad taste that many of us felt like walking away from the college. Interestingly enough, the one person who had applied for the cancelled Foundation course has since passed his course and is now our new enrolments officer!

On to more positive news, the Standard and Advance course is nearing completion with 6 students booked to take exams in late November. We took a new approach to the course this year with a single course for both categories and a single 9 month course instead of two 6 month courses. This has been successful with all course participants likely to pass their respective exams.

We are now taking nominations for next year's courses but we are also looking for more instructors to spread the load. We are particularly interested in any amateurs with professional qualifications or experience. We currently have 4-5 instructors and would love to include another 2-3.

While the standard and advance courses are a week by week commitment for all involved, we are also looking for people to assist with foundation courses and exams. While having more assessors available is certainly needed, we equally need non assessor volunteers to assist with the course. You don't need to be a member and you don't need to commit to ongoing courses. If many hams volunteered to assist once a year, this would lighten the load for some of our longer serving members and be very appreciated.

## VHF Group

### News from the WA VHF Group

Recently we participated in JOTA at two sites, our QTH at Wireless Hill in Applecross and at the Leighton Gun Battery in Mosman Park. Stalwart member Bob VK6KW reconfigured our antenna array at Wireless hill to make the best use of available resources. This meant that our GPS locked multi-mode beacons were off air for the few days it took to set up, participate and return things to normal. Thanks to the Amateur community in VK6 and beyond for patience while JOTA was under way.

Leighton antennas were set up by Bob, with some assistance from yours truly, on Friday afternoon. Operations there on Saturday 19<sup>th</sup> courtesy of Robert VK6FRDM and Bob, with visits by Terry VK6ZLT our President, and others. They had about 150 Scouts, mostly in younger ranks who were very appreciative of the opportunity to go on air, many for their first time. At Wireless Hill Steve VK6BBM, Terry, Randall VK6WR and first harmonic, Rick, Graham, Rob and others contributed much appreciated support. Randall's first harmonic delighted in operating and we lost count of the number of Scouts with

whom she spoke!

Our "main event" was during the evening on Saturday and when other sites closed down, Terry took it upon himself to provide contact from his QTH for many of our 50 or so young Sea Scouts. Mention should be made too of Reg VK6BQQ's grandson Noah who, at age 6, provided very good contact with a dozen or more of our contingent. Reg isn't a member but he's a highly respected member of our VK6 community and it would be a disservice not to mention his - and Noah's - contribution.

Speaking of Terry as President reminds me that the WA VHF Group had its AGM in late September seeing the majority of Committee re-elected and with some new

faces too. I am reminded that Committees are like ships... they have a sharp end and a blunt end. The sharp end (represented by the new faces) has the potential to navigate into new waters. The blunt end, the continuing members, represent stability, power and keeping things on an even keel. It will be good to see how many "new waters" we navigate in the coming year. And on the back of another successful JOTA I am humbled by the collegiate nature of our – and hopefully all – Amateur clubs.

Satellites and Museum Exhibition – we'll keep that for next time!

73

Denis VK6AKR for the  
WA VHF Group

## Girl Guides WA – JOTA

The Girl Guides WA JOTA station VK6GGS was again on air this year from Guide House in Belmont (WA HQ), using a remotely operated HF station on 20, 15 and 10m and a DMR station operated from the venue.

We had 50-60 guides through the event with quite a few contacts made into Victoria and New South Wales Guide and Scout units on 20m. DMR was less successful as we were still setting up the programming of the radio throughout the day.

Our next radio centric event will be International day near the Optus Stadium in early November.



## Silent Key

### Robert Sutherland VK6ABS

Bob grew up in the Manly area of Sydney and like most young guys of the time enjoyed spending time surfing and fishing off the Manly wharf. He would spend hours getting around on his push bike. Active from an early age he climbed up on the roof of the chook house before he could even walk. His mischievous nature and sense of adventure earned him the occasional clip around the ear from the local constabulary. It's no surprise he climbed a tree to watch Don Bradman bat one day & of course later in life it wasn't unusual to see him at the top of a radio mast.

A little-known fact is that when the Sydney Harbour Bridge first opened, he was one of the first school kids to walk across it.

It was during his school years that he developed a keen interest in radio and electronics, so decided to head off to Radio College in Sydney.

He joined the army soon thereafter and was off to the war in New Guinea. Bob obviously served in the signals corp.

His interest in radio remained with him all his life both in a working capacity and as a hobby in the form of Amateur Radio.

After the war Bob decided to stay in PNG and by then his parents had parted company, so his mother and siblings all moved up to Rabaul, to be with Bob. That's where he made his life for the next 20

years. His work involving radio took him on all sorts adventures throughout PNG. He was a clever and resourceful technician who could fix anything and make whatever was needed out of whatever materials were available, a true bush technician. A very practical man in more ways than one he always said that "if you couldn't mow it or eat it, you got rid of it".

The bachelor life ended in his early forties when Aida went to PNG to visit friends. She stole Bob's heart and they were married in Rabaul. They both made their home in Port Moresby which is where children Hilary and Jamie (deceased) were born.

Bob worked in the Posts and Telecommunications office in Port Moresby. He was a Radio Inspector.

As an amateur radio operator, he held the callsign VK9BS/9 & then P29BS and was very proud to have worked well over 100 DXCC countries making such rare contacts as King Husain of Jordan. He even worked Aves Island in the Caribbean.

When cyclone Tracy hit Darwin in 1974, they lost all communication but from Port Moresby he was able to contact an operator in Darwin and relay the first information back to the authorities in Australia.

Bob and Aida returned to Australia in the mid 1980's due to the growing unrest in Port Moresby. He took the callsign

VK6ABS and joined the WIA.

He enjoyed nothing more than a beer and a chat and those who were lucky enough to spend a bit of time with him either on the air or 1 on 1, enjoyed some fascinating stories and his witty and dry sense of humour.

Bob tried but couldn't cope with Perth suburbia, his love of the bush and space was too strong so off he went to find his patch of land in Gibson, near Esperance, where he was able to proudly have a significant antenna farm, and was able to live happily for the next 27 years.

It was only in 2013 that Bob finally agreed to pack up move to BICKLEY, in the Perth Hills to live with his daughter, Hilary and Richard and their family.

Of course, Bob set up his Amateur Station in the garage in Bickley and was active on the air most days.

When someone asked Bob how he was, he often replied that when he checked the obituary section in the paper that morning, his name wasn't in it and so he was doing just fine. Bob was grateful for everyday he made the best of things no matter what. Bob enjoyed the simple pleasures of life.

Bob is survived by wife Aida, daughter Hilary and husband Richard and their four children.

Written and authorized by Hilary and Peter (VK8ZZ)





# VK7news

Justin Giles-Clark VK7TW  
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w <https://groups.io/g/vk7arnews>

## Congratulations VK7

VK7 has won the RD Contest for the third time running. Over 17% of licensed VK7's submitted logs for the contest with a total of 43 logs. Richard VK7ZBX won the Single Operator Phone section with 1101 points which is a new record. Murray VK7ZMS came third in the Single Operator Phone with 963 points. Herman VK7HW came third in the Single Operator Mixed section with 550 points. Peter VK7KPC came third in the QRP mixed section with 19 points and Bob VK7ZRF came second in the QRP phone section with 7 points. VK7HSD which is the new Huon Scout Group call under the guidance of Michael VK7MRS featured in the Multi-Single section with 13 points. It was great to see four scout groups in the Multi-Single section. The stand out VK7 Foundation licence entry was Paul VK7FPCL who came first in the Foundation Licence section with 255 points. First in the Team Score was the Cronies + 1 with Murray VK7ZMS, Richard VK7ZBX and Hayden VK7HH with 2506 points. A huge thank you to all VK7 who participated and made this win possible. Congratulations VK7!

## Records News

A number of records were set over the last few months - a new 3.4GHz Digital Record has been set within VK7. The record was set between Hayden VK7HH on Mt Wellington in Southern Tasmania and Peter VK7PD and Andre' VK7ZAB on Mt Barrow in Northern Tasmania over a distance of 168.7km. The digital WSJT mode - FT8 and was used and this was set on the



Photo 1: Antenna build day at Rex VK7MO's QTH. (Photo courtesy of Rex VK7MO)

2nd of September 2019. This was then broken on 22 October 2019 by Hayden, VK7HH and Richard VK7ZBX on Mt Wellington and Ralph VK3WRE on Mt Tassie, The VK3RGI beacons on 2.4 & 3.4GHz were visible on the waterfall and phone signal reports of 5/8 both ways and FT8 contacts were made and the distance was just over 500km.

The first VK7 to VK7 EME contact between Rex VK7MO and Richard VK7ZBX occurred on 31 August 2019. Rex was using a 113 cm dish and 90 watts and Richard a 75 cm dish and 60 watts. The contacts used the WSJT - QRA digital mode. There was a calculated 289dB of total loss and spreading was 35Hz which accounted for an additional 3.4dB of loss. It was calculated that there was 5dB in reserve with the QRA64

mode. The following day another contact was made with spreading at 3Hz which accounted for a 3.3dB improvement and Richard dropped his power to just 30 watts and completed the QRA64 QSO. This is believed to be the smallest dishes ever to complete an EME QSO with power of just 30 watts at one end. Congratulations to Rex and Richard.

## 23 CM QSO Party

The 23cm QSO occurs every week after the WIA and VK7 Amateur Radio broadcasts on a Sunday. All stations beam toward the passive reflector of Mt Wellington in Southern Tasmania and it is not unusual to have up to 10-12 stations. We hope his will be increasing soon following an antenna build day held toward the end of October. See everyone on 23cm!

## **North West News**

### **North West Chat & Show Group**

Saturday 7 September saw the Bi Monthly Chat N Show gathering at the Penguin Sports Centre. There was a great roll-up including some from the North of the state. Retired broadcast engineer Terry, VK7JAI, bought along some interesting items including some old Morse Keys and a valve Morse code oscillator. Terry also gave a chat on his experiments with narrow band communications.

### **North West Tasmanian**

#### **Radio and Television Group (NWTR&TVG)**

<http://www.nwtrtvg.com/>

The North West Tasmania Radio & TV Group met on Saturday 28 September. JOTA planning was the focus and plans were finalised for the activation of VK7SDL at the Leven Scout Headquarters to help facilitate radio operations for the 12 F Calls who passed their F Calls last year. A working bee was held to get Bob VK7BY back on the air after four years without antennas. Thanks to Dave VK7DC, Matthew VK7ML and Eric VK7EV for the working bee.

## **Northern News**

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

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

Wednesday 28 August was NTARC's annual social dinner with 23 members and partners attending and a great night was had by all. NTARC provided safety communications for an Equine Endurance Event held at Merseylea and everything went without a hitch. There was an 80 & 40km with 33 and 17 horses respectively. Thanks to Idris VK7ZIR, André VK7ZAB, Peter VK7KPC, Yvonne VK7FYM, Stuart VK7FEAT, Roger VK7ARN and new-comer David VK7XDM.

NTARC hosted over 100 guides and scouts over the JOTA/JOTI weekend. The Northern Area Rover Crew assembling a dozen or so computers for JOTI. Echolink was activated and contacts made

notably with the Huonville Scout Group (VK7HSD) and antennas and transceivers connected. There was also temporary timber tower work as part of their award badge program. Stuart VK7FEAT was assisting Tamar Sea Scouts with radio and antennas for JOTA and groups were able to contact back to the Rocherlea Scout Hall and further afield. Rovers and Venturers stayed overnight and operated Echolink. DMR, foxhunting, electronic kits and Edison robots were all activities enjoyed during the weekend.

Thanks to Yvonne VK7FYM, Ros, Idris VK7ZIR, Norm VK7KTN, Kevin VK7KJL, Lewis VK7FLPL, Tony VK7YBG, Andre VK7ZAB, Stefan VK7ZSB, Anne VK7FYBG, Lorraine xyl of VK7KTN and Kay xyl of VK7KPC.

The Wednesday night technical sessions are going gang-busters with many activities, equipment and people coming along with technical and non-technical focus. Some of the activities were DMR programming, many new and old transceivers, GPSDOs, antennas & antenna tuner tutorials, VNA & antenna analysers and analysis, microwave transverters, RigPi station servers and much more.

## **Southern News**

### **JOTA/JOTI Huonville**

The author was privileged to drop in on the Huonville Scout & Guide Group over the JOTA weekend. WOW - there has been a huge

amount of work undertaken and driven by Dale VK7FNED (Scout Leader) and Michael VK7MRS who is the Huon District JOTA coordinator. The callsign is VK7HSD (Huon Scout District) and they officially opened the VK7HSD shack and THE KAAPORT (named after Mark Norris' 25 years of Scouting in the Huon Valley) on 17<sup>th</sup> August 2019.

Their VK7HSD motto is "INSPIRING OTHERS TO ACHIEVE A LIFE TIME HOBBY" and this has been adopted to encourage young people to participate and hopefully gain their amateur radio licence. There are already three foundation licence holders in the troop and more to come with the start of a radio patrol elective which supports and assists cubs and scouts to get their Foundation Licence. The shack is really well appointed with radios, antennas, handhelds, DMR hotspot 5057118, Echolink node 913668, computers and much more!

During JOTA it was in full swing with HF contacts happening with scouts in one room and DMR going in the main hall. A huge congratulations to Michael and Dale for permanently making amateur radio a part of the Huonville Scout Troop activities.

## **Radio and Electronics Association of Southern Tasmania Inc.**

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

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

*Photo 2: ABC tour attendees in TV News Studio. (Photo courtesy of Justin VK7TW)*





Photo 3: Dale VK7DG explaining automated handling. (Photo courtesy of Justin VK7TW)

In September REAST had a behind the scenes tour of the ABC TV & Radio in Hobart. A huge thank you to Damien VK7SD and Alan VK7KAD who were our fantastic hosts for the night. Both Damien and Alan are technical support staff at the ABC. We saw radio and TV studios, radio & TV master control, radio and TV demonstrations, chroma-key screens, datacentres, TV controls and microwave link vans.

In October REAST learnt all about milk! A huge thank you to Dale VK7DG and Dave VK7FABE who both work at the Lion Drinks & Milk Company at Lenah Valley. After all kitting up with personal protective equipment we started where the milk comes into the factory from the semi-trailers into the holding tanks. Once pasteurised it is fed to the different areas of the factory through a massive matrix valve switch. The factory is fully PLC controlled and Dale explained the Profibus system and how it is used to control valves, motors and sensors. The carton and bottle filling lines were a process control wonder! I am sure we will not look at that litre of milk the same way again!

Our DATV Experimenter's nights are in full swing and we now stream the Wednesday nights from 7:30pm (AEDST) via the YouTube

streaming facility. Just go to the REAST Website and go to the "Live Stream" page at <https://www.reast.asn.au/news-events/live-stream/> or catch-up later on the REAST Youtube channel - <https://youtu.be/1PiZHJikNWg>

### Silent Key **RIEGER, Gerhard Karl (Gerry) VK7GK**

Became silent key at the age of 79 on the 30 August 2019. Gerry was first licensed in 1965 and kept licensed up to becoming Silent Key.

His large tower with his 40m Quad could be seen as you passed through Granton. In later years he set up a contest station on a hill at Dromedary.

Vale Gerry.  
(Richard Rogers, VK7RO)

### Silent Key **George Christie, VK7MCA**

It is with great sadness we advise that 93 year old, George Christie, VK7MCA passed away peacefully at the Deloraine District Hospital on Friday August 16, 2019.

George was a thorough gentleman but also had a wicked sense of humour. He entered amateur radio at a fairly advanced age, having been encouraged to

become an amateur by his best friend, fellow long-term Deloraine resident Bill Carter VK7AK (SK). George could not have wished for a more qualified Elmer than Bill, just a few years older than George and at the time. Bill took George under his wing and mentored him through his studies. They were a formidable pair, both with sparkling wit and humour. Sadly Bill passed away before George obtained his licence.

When George applied for his call sign VK7MCA he was asked whether it had any special meaning. His answer was typical George. "My cuddly Alice", he explained. George couldn't wait to see his name and callsign listed in the WIA call book but when he got his licence it was too late in the year and so he missed that year's Call Book print run. George then frequently joked that hopefully he would still be around to see it in print the following year. Well, he did that comfortably and also saw it in print for still several more years.

To Ali and family from the Northern Tasmanian ARC family we extend our deepest heartfelt condolences. We all feel honoured and blessed to have known George and number him among our closest friends.

VALE George, 1926 – 2019  
(Yvonne Maxwell VK7FYMX,  
NTARC Secretary)

### Silent Key **Peter Sykes VK7YP**

Peter became silent key on Sunday the 8th of September 2019 at the age of 91 in the Strathglen Aged care village. He was a keen amateur for a number of decades, working over 300 countries, active mainly on the HF band. Peter was an active member of the WIA and Radio and Electronics Association of Southern Tasmania (REAST) for many years. Peter's callsign was chosen after his wife Y for Yvonne and P for Peter.

Vale Peter  
Regards, Damien VK7SD, on behalf of the Sykes family.



# Remembrance Day Contest 2019

Alan Shannon VK4SN

At the risk of repeating myself each year, once again congratulations go to VK7 as the 2019 Remembrance Day Contest Winning state.

The number of logs received is commendable with over 17 percent of VK7 licensed operators submitting logs.

Congratulations go to the following individuals;

SOPH VK7ZBX 1101 (New Record),  
SOCW VK2GR 550, SOMX VK5SFA  
815, QRPPH VK3FTZD 9, QRPCW  
VK3MH 336, QPRMX VK3VT 259,  
MS VK2GGC 1012, MM VK4QH  
963.

The highest scoring Rookie was won by Scott VK4MGL with 17 points in the Single Op Phone section.

Top Foundation operator was Paul VK7FPCL with 255 points in the Single Op Phone section.

Top Team was Cronies+1 (VK7ZBX, VK7ZMS, VK7HH) setting a new team record with a score of 2506, beating their own record from last year.

Activity was a little better than last year and some favourable comments for conditions were noted by southern operators. From a VK4 perspective propagation was poor to our southern cousins and they listened to one sided conversations and the unpredictable QSB swinging signals from S9 to absolutely nothing in seconds. VK4's experienced this on most bands with 20 and 40 meters being the worst. The team at VK4QH ran 3 bands at all times and still did not come close to any records, although the ops missed a lot of triple points with sleep overpowering the need for contacts.

185 logs were submitted (174 last year) –includes 1 x checklog and a very late entry not included



VK4QH Multi-multi Winners with (L to R) Alan VK4SN, Mike VK4FAKE, and Ken VK4QH.

in the results. 17 multi-operator stations (12 last year) came up on air and most submitted very respectable scores. Paper logs are slowly on the decline with only 6 logs received. A lot of unique callsigns were noted in some logs and on checking one log it was almost deemed "padding" as one call is worked multiple times in a log, but when checked against the ACMA database the callsign does not exist. These calls were scored zero points. Other unique calls were noted where a submitted log exchanged QSO's with a station only showing in one log and claimed points on multiple bands including several bands above 2 meters. Even though it is not against the rules, it is not fair to other contestants and removing all bands above 70cm for next year's contest may produce a competitive level playing field. The idea has been tossed around on social media for a couple of years and seemed to be favourable towards the move and is

more in line to the frequencies used by the troops in WWII.

All logging programs worked perfectly except for those operators who still use old versions of software and produce old versions of Cabrillo logs not compatible with the new upload website. The second major problem is operators changing the headers to non standard values and finding the log is rejected on upload. All information is on the WIA RD website page to assist operators but it seems you can lead a horse to water... In saying that, there is a huge improvement in the sites use and the quality of the logs are very high with correct logging of calls and exchanges resulting in a lot of 'golden logs'. The VK Log Checker website will be moved from its current development site to a domain of its own for next year.

A few operators have asked to change the date of the Remembrance Day contest to a specific date. The weekend closest

TEAM NAME	CALLSIGN1	SCORE	CALLSIGN2	SCORE	CALLSIGN3	SCORE	TOTAL
Cronies + 1	VK7ZBX	1101	VK7ZMS	963	VK7HH	442	2506
AREG1	VK5AKH	942	VK5SFA	815	VK5IR	124	1881
NSW Wombats	VK2GR	550	VK2IR	124	VK2PN	326	1000

Table 1: Remembrance Day Contest 2018 Team Results

Table 2: Full results.

SINGLE OP PHONE								QRP PHONE	
Callsign	Points	Callsign	Points	Callsign	Points	Callsign	Points	Callsign	Points
VK7ZBX	1101	VK7KK	145	VK6FLTC	45	VK7AN	8	VK3FTZD	9
VK2PR	1012	VK7RM	142	VK7KDV	45	VK3FAXI	7	VK7ZRF	7
VK7ZMS	963	VK6YD	137	VK6ZMS	44	VK3AE	6	VK6AD	6
VK7TW	895	VK2LEE	130	VK2TTL	42	VK7FLAR	6	VK5FBIC	5
VK7OO	857	VK7DIK	130	VK6TU	42	VK2FCMD	5	QRP CW	
VK2MT	679	VK2MTM	129	VK2KHA	40	VK2HHS	3	Callsign	
VK7VH	630	VK6ZRW	125	VK4JSS	40	SINGLE OP MIXED		VK3MH	336
VK7FB	561	VK7LG	122	VK6GD	40	VK5SFA	815	VK2IG	100
VK7MO	537	VK5PL	113	VK7KC	39	VK5LJ	811	VK3QB	72
VK5CB	530	VK2YD	111	VK3NCC	37	VK7HW	550	VK4QS	42
VK7HH	442	VK2EZT	106	VK3DAN	36	VK7BO	533	VK2AYD	12
VK7KAJ	441	VK7WN	103	VK7TU	36	VK6CSW	304	VK2EMU	2
VK7JGD	431	VK7AW	91	VK6MK	35	VK3SIM	289	QRP MIXED	
VK3TIN	403	VK3ADW	88	VK5KX	33	VK7GN	280	Callsign	
VK7BEN	384	VK6WK	88	VK4ADC	32	VK3KTT	206	VK3VT	259
VK2QV	372	VK7HSE	86	VK3JWT	30	VK3AUQ	184	VK2MG	133
VK5DT	333	VK6ADI	86	VK3BWM	27	VK2AZ	183	VK7KPC	19
VK2XAX	292	VK3AMW	83	VK6AAO	27	VK6RZ	136	MULTI-SINGLE	
VK7ZCR	268	VK3JK	82	VK6AB	27	VK6DW	131	Callsign	
VK7WLH	264	VK6MM	82	VK6FRLR	26	VK5IR	124	VK2BPL	109
VK1MA	262	VK5DJ	78	VK6SN	26	VK2GGC	1012	VK6NAD	89
VK7FPCL	255	VK3AVV	75	VK2YW	21	VK5AKH	942	VK3CTM	68
VK3LM	232	VK2VV	70	VK7KW	21	VK4HH	782	VK3HJ	64
VK5OQ	230	VK5NNN	70	VK7PD	21	VK6DDX	293	VK6GC	57
VK2HBG	228	VK6POP	70	VK7BYL	20	VK3WI	140	VK5UE	7
VK3MB	226	VK3DEK	69	VK5DP	19	VK5BWR	113	SINGLE OP CW	
VK7QP	226	VK2NP	67	VK7LH	19	VK3SAY	70	Callsign	
VK6QS	212	VK3ASU	66	VK7KT	18	VK3ER	52	VK2GR	550
VK6XL	210	VK6MIL	65	VK3ZAP	17	VK2BOR	42	VK2PN	326
VK3BNR	202	VK6PCB	65	VK4MGL	17	VK3SDJ	31	VK2IR	310
VK7GH	194	VK1DW	60	VK3NRD	15	VK3SAK	17	VK2KJJ	122
VK6RC	192	VK2BMU	56	VK4FLR	15	VK7HSD	13	VK2WQ	
VK3MDH	168	VK6WR	53	VK2BBQ	13	VK2EL	50	MULTI-MULTI	
VK7CL	164	VK5XY	52	VK2CAL	11	VK5NE	42	VK4QH	963
VK2DWP	159	VK2JON	50	VK7DW	10	VK6AAK	40	VK6NC	768
VK6BDO	154	VK6MSC	50	VK7FREU	10	VK2BJT	10	VK2AWX	664
VK6MAC	154	VK3LRE	48	VK3FLCS	9	VK6BEK	6	VK4WIS	534
VK7NTK	152	VK6FCMF	47	VK8VWA	9	VK2AEJ	4	VK6CLL	250
VK6JP	146	VK3TNL	45	VK6KSA	8	DISQUALIFIED:			
VK7DJ / VK7AJ				Rule 11.3				CHECKLOG:	
								ZL2LDX	

STATE	LOGS	CNTCTS	PH	CW	RAW	WEIGH	WEIGHTED
					SCORE	FACTOR	SCORE
VK 1	2	215	215	0	322	408	0.79
VK 2	38	4507	3628	664	6774	3745	1.81
VK 3	36	2639	2314	325	3768	3965	0.95
VK 4	8	1694	1535	159	2425	2322	1.04
VK 5	17	2919	2626	293	4321	1574	2.75
VK 6	38	3533	3390	55	4259	1021	4.17
VK 7	43	7257	7092	165	11255	246	45.75
VK 8	1	9	9	0	9	133	0.07
TOTAL	183	22781	20817	1661	33141		TOTAL

Table 2. Logs and contacts submitted showing VK7's huge weighted winning score.

to the 15<sup>th</sup> of August has meaning for our veterans. Recently a group of RSL and ex Veteran groups were put forward the scenario of the RD contest for them to make comment on changing the date.

These guys were genuinely

horrified and appalled at the notion. They were obviously angry and comments like 'Un-Australian, disrespectful, and lack of compassion and understanding echoed around the room. Someone commented that it would be like

changing the time and date of Anzac Day. It's time and date has meaning and will never be changed. And so fellow hams, the weekend closest to the 15th of August will NOT be changed.

Thanks go to those whom I requested a rewrite of their logs which was gladly done and re-submitted. Big thanks to those involved in getting a guest speaker for the Remembrance Day speech, especially Peter VK1PE. Peter has skills I don't.

As per usual, there is a full report and statistics on the WIA Website in the download area.

State winner certificates are in PDF format and can be downloaded and printed by the operator.

Best 73 and see you next year.  
Alan VK4SN.



## JOTA-JOTI 2019 far North Queensland

Mike VK4MIK and Bob VK4BOB

Several Amateurs organised the 2019 JOTA event in the Cairns area with the Scouting organisation some time prior – this allowed both the Scouts to organise a Scout Den, and liaise with other scout groups in the area. It also allowed the amateurs to organise suitable antennas etc. for the location taking into account power lines, to ensure we don't end up "bright sparks", available space and other issues e.g. trees, sporting fields etc.

The Scouts decided to use the Bayview Scout Hall for the event and had rosters for Joeys, Cubs and Scouts. We found out that they had already covered the personal security potential concerns by discussing issues covered by the Stranger Danger programme and the fact

that no personal information was to be passed via radio or internet during the event.

It was decided to commence the event in the afternoon to give best probability of the bands being open and working into the night.

Radio equipment used was an IC7300 Transceiver, SPE linear and a trapped vertical and W3EDP long

wire antenna. Steve used his DMR UHF Hot Spot equipment.

Amateurs who took part were Bob, VK4BOB, Helmut VK4YKI, Steve VK4FBRO and Mike VK4MIK.

Unfortunately the period was plagued with short openings which were frustrating for both the Scouts and the Radio Operators but, thankfully, the Scout Leaders

realised that it was beyond our abilities to change/improve nature at work! In such conditions one can but persevere. Overall it was a case of giving talks to the Scouts, Cubs and Joeys about the ionosphere and the layers and a bit about the issue of working at the bottom of the cycle.

At the final parade the Scout leaders thanked us for our efforts and we undertook to try again next year.



Bob VK4BOB at the main operating JOTA station.



**Without your support there could be no effective representation of the amateur and amateur-satellite services at WRC-19 and other international meetings and conferences.**

Here is a look at where the remaining major issues potentially affecting the amateur services stand at the midway point.

**50 MHz in Region 1:** While a couple of details remain to be worked out as to how other existing services in Region 1 countries are to be protected from interference, there is agreement that the amateur service should gain an entry in the International Table of Frequency Allocations for Region 1. The present allocations in Regions 2 and 3 will be unchanged. WRC decisions are made by consensus and Region 1 administrations came to Sharm El-Sheikh with disparate views ranging from a 4-MHz primary allocation to no allocation at all, so a delicate compromise had to be fashioned to reach a positive outcome. While it is too early to celebrate, we are cautiously optimistic that the compromise will hold. Dale, VK1DSH chaired ten meetings of the Sub-Working Group responsible for this agenda item. The compromise will be reviewed at the Working Group and Committee levels over the next few days but will not become final until the second reading of the document in the Plenary, which may not occur until the fourth week.

**Future agenda items:** The IARU is not seeking any agenda items for future WRCs at this conference. With the spectrum from 8.3 kHz to 275 GHz fully allocated and some bands above 275 GHz already identified for particular uses, any proposal for new allocations involves sharing with one or more incumbent services. The pressures for spectrum access to accommodate new uses for commercial purposes are intense; for an established service such as ours, any WRC that does not reduce our own useful spectrum access is a success.

**23cm:** The idea of including the amateur two meter band in a study of non-safety aeronautical mobile service applications has not resurfaced. [Ed: this was most likely a “smoke-screen” proposal to deflect attention from the 23cm proposal to remove secondary access to 23cm.] However, the IARU is concerned with a proposed item for WRC-23 entitled: “Review of the amateur service and the amateur-satellite service allocations to ensure the protection of the radionavigation-satellite service (space-to-Earth) in the frequency band 1240-1300 MHz.”

Our regulatory status is already clear. The amateur service is secondary in this band and the amateur-satellite service is permitted to operate in the Earth-to-space direction on a non-interference basis in the band 1260-1270 MHz. In the International Radio Regulations this is all the protection a primary service such as radionavigation-satellite requires; implementation is up to individual administrations.

The one well-documented case of interference to a Galileo receiver that prompted this proposed agenda item occurred more than five years ago and was quickly resolved by the administration concerned. There have been no known interference cases to user terminals.

An amateur service allocation of 1215-1300 MHz was made on a primary, exclusive basis in 1947, later downgraded to secondary to accommodate radiolocation (radar) and narrowed to 1240-1300 MHz. The radionavigation-satellite service was added in 2000. As a secondary service amateur radio has operated successfully in the band for many years. Given the relatively modest density and numbers of amateur transmissions in the band, we view the Galileo-oriented proposal for an agenda item as disproportionate.

The IARU recognizes the concern and does not want the amateur service to affect the operation of the Galileo system in any way. It has already updated its operational recommendations for amateur

stations in Region 1. If necessary, further recommendations may be developed and rolled out globally.

In CEPT, two preliminary measurement studies of Galileo receiver performance/vulnerability (from 2015 and 2019) are currently being evaluated. Discussions can be more timely and focused within CEPT. The IARU believes that this process already offers the potential for a satisfactory solution and thus the issue does not warrant WRC action and the commitment of ITU resources.

**Satellites:** While it does not directly affect us – work at WRC-15 saw to that – we are following an agenda item that seeks spectrum for telemetry, tracking and command in the space operation service for non-GSO satellites with short duration missions (CubeSats, among others). We would like a solution to be found to cut down on the misuse of the very limited amateur-satellite spectrum for commercial applications. Discussions are focusing on spectrum near 137 MHz (down)/149MHz (up) but reaching agreement is proving to be very difficult.

**Resolutions:** Every WRC reviews the resolutions and recommendations adopted by previous conferences.

This time two resolutions involving the amateur services were proposed for suppression.

Resolution 641 prohibiting broadcasting in the 7000-7100 kHz was last revised in 1987 and became out-of-date in 2003 when the global amateur band was extended upward to 7200 kHz. Administrations were not persuaded that the resolution was still required and none proposed a modification to cover the additional 100 kHz. Suppressing it was better than leaving an obsolete resolution on the books, so we did not try to retain it.

After examining Resolution 642 that sets out the procedure for submitting information on typical amateur-satellite earth stations for publication by the ITU, several administrations decided that would

suppression would be premature. The resolution, which has been on the books since 1979, has been retained with no change. An update may be considered in the future.

**Work-in-Progress:** Meetings continued through the weekend and will go on every day and well into the night as WRC-19 heads to its conclusion on 22 November.

Source: IARU WRC-19 delegation

### IARU WRC19 Update - Week 1

Sharm El-Sheikh, Egypt, 1 November 2019 – Week 1 of the 2019 World Radiocommunication Conference saw agreement reached on several issues on which discussions prior to the conference had revealed consensus. Those were the easy ones; the rest will be more difficult.

The early decisions here in Sharm El-Sheikh were only possible because of countless hours of work conducted within the ITU Radiocommunication Sector and the six regional telecommunications organizations (RTOs) since the previous WRC in 2015. Three of these decisions were on issues of interest to the IARU.

**47 GHz band:** The band 47.0–47.2 GHz was allocated solely to the amateur and amateur-satellite services by the 1979 World Administrative Radio Conference. Commercial wireless broadband interests had expressed some interest in the band being designated for International Mobile Telecommunications (IMT) and there was some concern that such a proposal might be made at WRC-19. The fact that none was forthcoming was due in part to the work of the IARU at the Conference Preparatory Meeting earlier this year and in the RTOs. The WRC has agreed to “no change” (NOC) at 47.0–47.2 GHz.

**5850–5925 MHz band:** Another NOC decision that avoided impact on the amateur service applies to

the band 5850–5925 MHz, which is an amateur secondary allocation in Region 2. Consideration of proposals involving other parts of spectrum in the 5-GHz range will take much longer.

### Wireless Power Transmission

**(WPT):** Finally, the WRC has agreed to make no frequency allocations or other changes to the Radio Regulations to accommodate Wireless Power Transmission for electric vehicles (WPT-EV). Much more work remains to be done on an urgent basis in the ITU and other standards organizations if radiocommunication services are to be adequately protected from harmful interference that may be generated by WPT-EV, both at the fundamental frequency and from unwanted emissions

**6 Metre Band:** Consideration of a 50 MHz allocation in Region 1 to harmonize the allocations in the three Regions was the subject of spirited debate in a Sub Working Group chaired by Dale Hughes, VK1DSH, of the Australian delegation. The four RTOs in Region 1 made disparate proposals to the conference and a small group of administrations proposed NOC. For three days there was no progress toward a consensus solution but that changed on Friday morning. An agreement has been reached, subject to confirmation by the regional groups, that will provide administrations in Region 1 with flexibility in how to accommodate their amateurs.

**WRC-23 Agenda:** One of the most difficult issues facing WRC-19 is to develop an agenda for WRC-23. There are dozens of proposals for agenda items and they cannot all be accommodated within available ITU resources. The substantive work of considering these proposals began on Friday afternoon and must be completed over the next two weeks.

Some meetings on the more difficult issues are scheduled for

Saturday, 2 November. Delegates have been warned to expect more intensive use of weekend and evening hours as the conference proceeds toward its conclusion on 22 November.

Source: IARU WRC-19 delegation

### Happy 45th Birthday AMSAT OSCAR 7 !

At 17:11 UTC on November 15, 1974 a Delta-2310 rocket lifted off from SLC-2W at Vandenberg Air Force Base, sending AO-7 into orbit along with NOAA-4 and Intasat. Details about the launch and initial telemetry reception can be found at <https://tinyurl.com/ANS-321-AO7Launch>

After nearly 7 years of service, AO-7 was thought to have reached the end of its life in June 1981 due to battery failure. A retrospective detailing its exemplary record was published in the AMSAT Satellite Report, available at <https://tinyurl.com/ANS-321-AO7Record>

Though it was thought to be lost in 1981, there are reports that the Polish Solidarity movement used AO-7 to pass messages in 1982 while Poland was under martial law. An article, in Polish, with the details is available at <https://tinyurl.com/AO-7-Poland>

Twenty years later, on June 21, 2002, G3IOR reported that he heard an old-style CW beacon from an unknown OSCAR satellite near 145.970 MHz. This was soon identified as AMSAT-OSCAR 7. The original AMSAT-BB post with news of the discovery is archived at <https://tinyurl.com/ANS-321-AO7BB>

Despite some pre-launch predictions that the CMOS logic circuits on-board “wouldn’t last 3 weeks,” AO-7 remains operational and well-used while in sunlight. It is the oldest operational satellite, in any service, in orbit. <https://www.amsat.org/two-way-satellites/ao-7/>

Source: AMSAT







## Contributions to Amateur Radio

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

Your contribution and feedback is welcomed.

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

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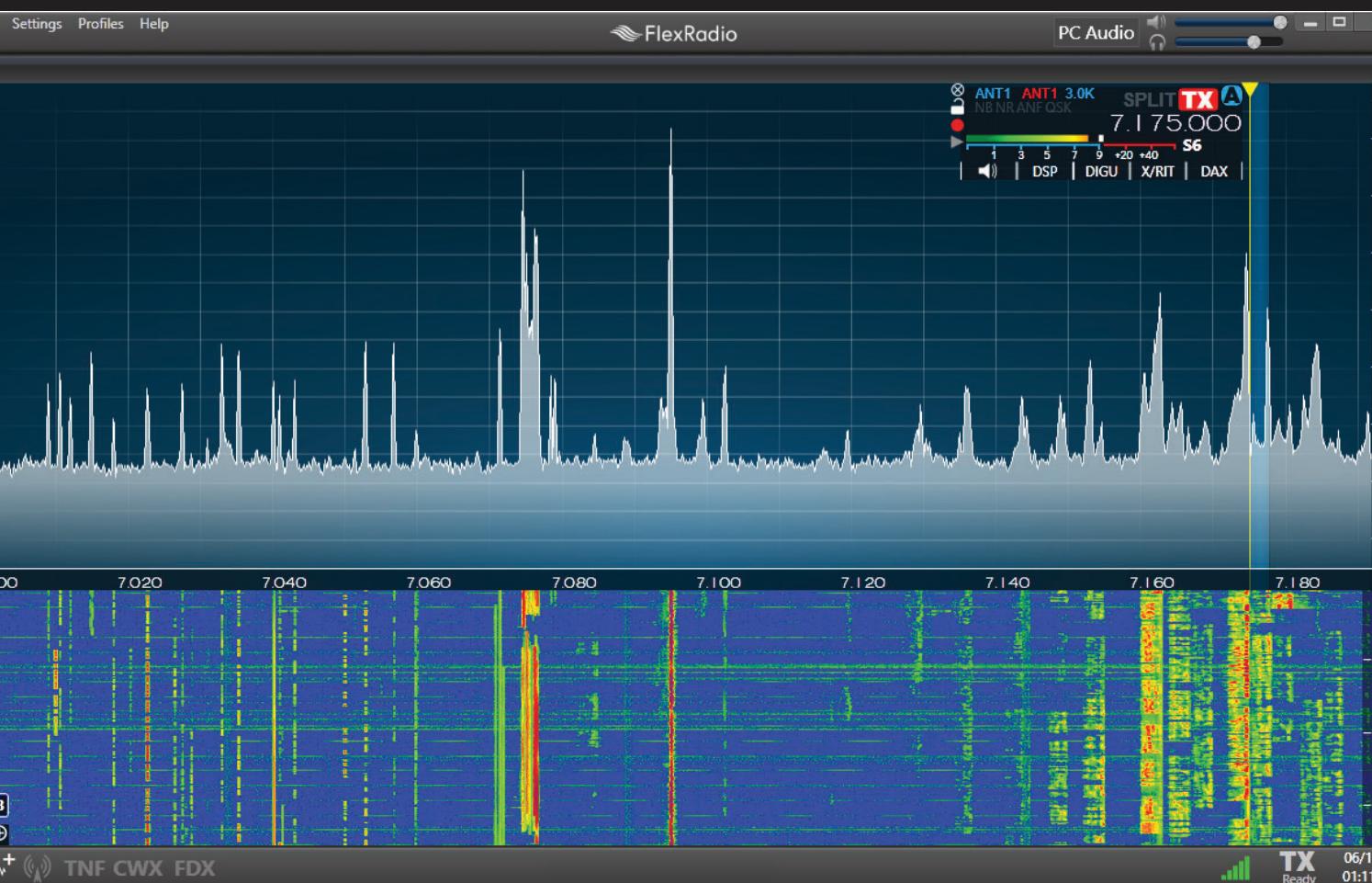
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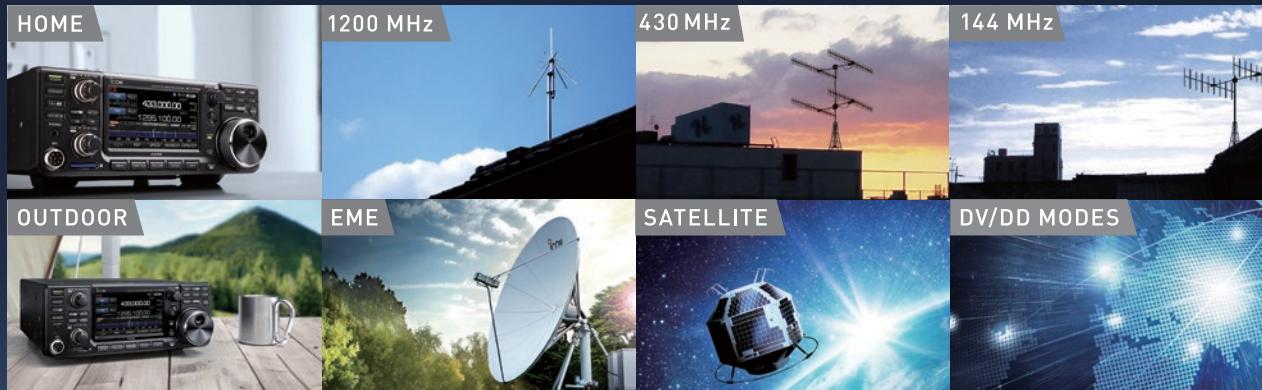
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