

Amateur Radio

Volume 84
Number 12
December 2016
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Season's Greetings

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Amateur Radio

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Volume 84
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This month's cover
The PARG shelter, trailer and tower set up for
JOTA. Inset: Niamh Wilson from Ellenbrook
Guides participating in JOTA at the Northern
Corridor Radio Group. Photos by Paul Gardner
(main) and Guide Leader Helen Chance (inset).

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Contributions to Amateur Radio



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

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

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Back issues are available directly from the WIA National Office
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Amateur Radio Service

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

Wireless Institute of Australia

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Editorial

Peter Freeman VK3PF

Season's Greetings

Another year is approaching its conclusion, which brings with it many celebratory events. I trust that everyone will enjoy their applicable festivities and makes it safely through the festive season and into the New Year. Do take care, especially on the roads.

New publication

As you will see elsewhere in this issue, we anticipate having a new publication "*Wireless Men and Women at War*" available for sale in the very near future. The book will present many of the articles relating to the involvement of amateurs and experimenters in the development and use of radio communications in relation to military services.

In addition to articles previously published in *Amateur Radio*, several significant new articles are included in the volume.

Note that the WIA Bookshop is accepting orders for the book at discounted prices until 21 December 2016. Orders will be filled as soon as possible after publication.

The production team is hard at work finalising the book and a definite date for publication is not set at the time this Editorial was prepared, but it is anticipated that it should be available prior to the Office closing for the Christmas-New Year period.

The book should make an excellent gift for any amateur or anyone interested in military communications.

Corporate machinations

The rumour mill is currently going wild with a variety of speculations about changes the WIA is purported

to institute, together with various claims about perceptions and interpretations of previous actions of our organisation or its Board members.

So what are we to believe?

As reported on the WIA website, the new Treasurer and Assistant Treasurer are working hard to clarify the financial situation of the organisation. They have reported some discrepancies, but no wrongdoing at this time.

My personal belief is that we should allow the team to determine the true state of our financial affairs before we consider any further actions.

It will be interesting to read about the recommendations once the treasurers have made sense of the books.

Regardless of the outcome/s of the current review of the financial situation, members should carefully consider if they individually have something to offer in a leadership position on our Board. You will see a call for nominations elsewhere in this issue.

We can only vote for individuals who are prepared to stand and serve. Hopefully we can all look forward to facing a difficult task in early 2017 in deciding for whom we should vote for the Board positions which fall vacant at the next Annual General Meeting.

Speaking of which – the AGM – some basic details are now available for the AGM. Seek out the available information and consider making plans to be there in person!

Until next month,

Cheers,

Peter VK3PF



WIA comment

Phil Wait VK2ASD

December again!

Every time December comes around I can't believe it's been another year. This year in particular has been very difficult, as I'm sure all readers will be only too painfully aware. However, the good news is that we now have two very capable people looking after the WIA's financial systems, and although there are obviously some serious issues to work through, real progress is being made.

Let me introduce our new Treasurer, Chris Hendry VK3PAT, and Assistant Treasurer, Jeff Tubbenhauer VK5IU.

Chris has very extensive experience in all facets of business and financial management. In his early years, Chris served in the Royal Navy as a Navy Gunnery officer on HMS Hubberston, based in Singapore. He then went on to fill very senior financial management positions in banking, business management, facilities management, and founded the company *You, Me, and Him Advertising*. Chris is currently the Honorary Treasurer of the Wesley College Parents Association 4x4 Touring Club, something that many radio amateurs can identify with, I'm sure.

Jeff previously served the WIA back in the late 1970s, and for 32 years operated his own business as a Certified Financial Planner in Alice Springs. Chris is very experienced in business management and the finance and insurance industries, and has also served on a number of Boards, including the Cancer Council NT, and rugby union and golf clubs. Jeff is currently assisting Chris and is advising the Board

on issues in relation to the Club Insurance scheme.

I am certain these two very experienced volunteers will be a great asset to the WIA. They have certainly hit the ground running, and they advise much work needs to be done to be able to report the finances accurately. It is fixable, but at a great cost of time for our Treasurers. I also expect there will be some major changes coming soon including a recommendation to undertake a strategic review. Remember, the national WIA is only 13 years old, and it's time to review our operations and how we can best meet our member's diverse needs.

At the time of writing, the WIA has just circulated a new draft Volunteers Charter to all current Committee members. This is a first for the WIA and has been developed from principles embodied in publications by *Volunteer Australia* (www.volunteer.com.au). The Charter will clarify what volunteers should be able to expect from the WIA, and in turn, what the WIA should be able to expect of its many volunteers.

We are working to have the Charter introduced very early in the New Year, and we are receiving a lot of valuable feedback and suggestions from Committee members. Following adoption of the Charter, we plan to commence a review of the Committee system.

The other big event this month is the publication of Peter Wolfenden's ANZAC feature series of articles about radio amateurs in wartime. I am sure you will all agree that Peter's articles (and those of other

contributors) in *Amateur Radio* over this year and last year were a fabulous read, and now we have brought them all together into a new commemorative publication: *Wireless Men & Women at War*.

Owing to the imperative to not financially overcommit the WIA at present, the Board has decided to offer pre-release sales of this publication at a discount to the planned members' price of \$29.95. Discounted pre-release sales will continue to 21 December, and the book will be printed in January, with sales expected from within and outside the amateur community. Peter Wolfenden VK3RV and the Publications Committee have done a terrific job on this, and it is set to be a real classic. Please do buy a copy during the pre-release sales period.

So, another year has passed. I would like to sincerely thank all those who have supported the WIA over the past year, and all those that have done their bit for Amateur Radio. Members must remember that the WIA represents all Amateurs, whether a member or not, and there are external forces that do not see the value to society of Ham Radio. The WIA must promote our volunteers to be vigilant of our bands and our contribution to society.

I wish everyone a very Merry Christmas and a happy New Year and remember to tell Santa Claus "You can't have too many radios".



Delay in ACMA licences

The WIA Office has been advised by ACMA Licensing that the processing time for applications for new amateur licences or variations to existing licences is around four weeks. Applications will be processed on a first in time basis.

These delays are unavoidable and the WIA will keep radio amateurs informed of any timing changes. We thank you for your patience.

Please note: those running Amateur Radio training courses need to be aware that candidates who are seeking licences for the end of year holiday period will need to have applications for licences lodged as soon as possible.

Callsign recommendations and licence time limits

The Wireless Institute of Australia has received queries about lapsed callsign recommendations by those who fail to pay the ACMA licence fee invoice on time. Failure to pay the ACMA invoice within 28 days after it is issued results in the ACMA charging a 'consideration fee' of \$28.

All WIA accessors and learning facilitators are reminded to tell candidates of the process, emphasising that the accuracy of candidate address and email accounts are vital to ensure against lost mail. The ACMA licence invoice may also be inadvertently routed away from their inbox and into the email spam folder. Please be on the lookout for an email from automailer@acma.gov.au

Apart from the ACMA "consideration fee" it would expect to receive a new licence application along with a fresh WIA callsign recommendation, which will incur extra unnecessary expense. The WIA Exam Service also sends an email to candidates congratulating them on getting a pass, and

explains the ACMA licence invoice procedure.

If the ACMA invoice doesn't arrive shortly after your name and recommend callsign appears on the ACMA database or you see that the displayed licence status is "Not Granted", then please contact the ACMA Customer Service Centre via phone 1300 850 115 to make a credit card payment over the phone. Or send an email info@acma.gov.au to request an invoice copy.

WIA Directors at Dick Smith Catch-up event

WIA President Phil Wait VK2ASD and director Roger Harrison VK2ZRH joined a throng of electronics industry identities past and present at Dick Smith's Sydney home on Saturday 22 October. The invitation-only event drew key past and long-term employees, industry identities from the 1970s and 80s, and some of Dick's partners in various adventures around the world.

The proprietors of the widely-known electronics stores, Altronics – Jack O'Donnell – and Jaycar – Gary Johnston, were there. Both adopted the DSE electronics retailing model and built successful businesses. Altronics is based in the West Australian capital of Perth, while Jaycar is headquartered in Sydney. Other industry identities of the 1970s and 80s swelled the crowd, including Owen Hill of Microbee fame, Greg Ackman of Mobile One – the famous manufacturer of mobile antennas, and Collyn Rivers, publisher of Electronics Today International in that era, where Phil and Roger worked.

Dick's very first employee, Marshall Gill, turned up, who worked for Dick in his original car radio business in the late-1960s. Also there was Ross Tester, who ran Dick's advertising division for years,

and the architect of those crowded magazine advertisements, with black and white illustrations and tiny, tiny type! One of the longest-serving employees, Chris Ayres appeared, who started with DSE as a components buyer and survived through all the ownership eras beginning with Dick himself, then Woolworths and finally, Anchorage Capital.

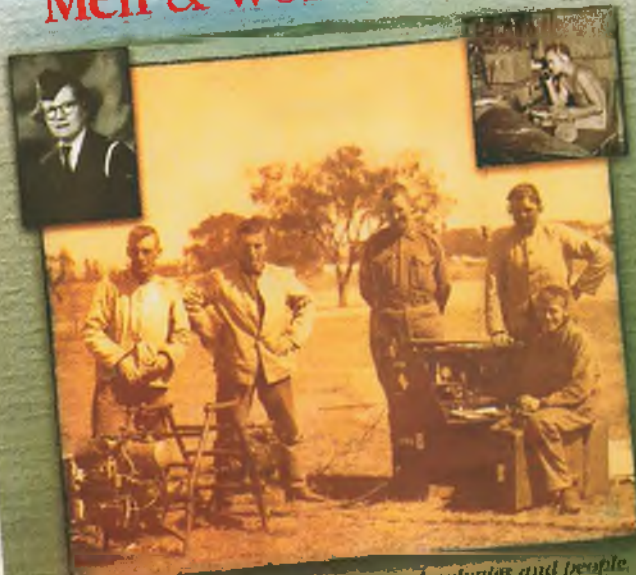
In his typical ebullient style, Dick stood on a chair in his helicopter hanger and harangued the audience with his views on the myth of 'continuous growth' and how the management of Dick Smith Electronics by Anchorage Capital brought on the final collapse of his and wife, Pip's, "baby". Dick told us all that he and Pip dreamed that the firm would last 50 years; in the end, it lasted 47. It had taken 15 years for Dick and Pip, and a phalanx of enthusiastic employees, to build Dick Smith Electronics and sell out to Woolworths for some \$20 million.

In reviewing DSE's history, Dick echoed the words of DSE's administrator, McGrathNicol, on what went wrong – dumb management blunders, such as expansion beyond belief, buying too much inventory, wrong product choices and too much debt. Dick was highly critical, saying the tragedy was a typical example of "professionals" that didn't know retail, never worked in the business and thought that, "... if a dummy like Dick could make money, just think what "professionals" could do!" Unsurprisingly, there was a smattering of radio amateurs among the throng – aside from VK2DIK himself; Ike Bain VK2AIG, Chris Ayres VK2YUS, Mark Plowman VK2MP, and Sandy Bruce-Smith ex-VK2AD and a ZL now. I'm unsure if I caught up with all those with a callsign.

Pre-sales of history book begin



Wireless Men & Women at War



Australian stories of the times, technologies and people
from WW1 to the 1960s



The Wireless Institute of Australia

The WIA Bookshop is now taking orders for the **'Wireless Men and Women at War'** publication that details the history of wireless communications before World War I, and in later years and conflicts.

The price is **\$29.95** plus postage for members and **\$35** for non-members, plus postage of \$9.

The pre-sale period is now available, with a \$7.50 discount applying for orders received by December 21.

WIA Historian *Peter Wolfenden VK3RV* has fully researched the content. Together with numerous additional contributors, the WIA Board fully supports this timely record of history as a must read volume.

The WIA Publications Committee is proud to make it available and after printing the book will be a mail order item from the WIA Bookshop.

To secure your limited edition copy, visit the WIA website. Be sure to let others know of its availability.

A campaign has begun seeking a wider market for the publication, including libraries, RSL clubs, and those with an interest of this historical subject.

Selected Contents

World War I:

An inspired experimenter and leader: Walter Hannam – his part of the jigsaw!

The spark gap signal that changed ANZAC history: Telegrapher William Wolseley Falconer, RAN

Between the Wars:

Bert Billings XJP, his service through WW1 and WW2 [The First and Last ANZAC Wireless Operator?]

YLS at War

HK Love A3BM/VK3KU: WW1 fighter pilot, engineer, magazine editor, explorer, electronics developer, WIA executive

World War II:

"Snow" Campbell VK3MR, International DXer, Prisoner Of War Making 'Winnie the war winner' Recollections of Air Warning and Coast Watching in New Guinea

The modern Era:

Australians at war get a radio station
Things Naval

Epilogue

The ANZAC 100 activities begin
The Centenary of Gallipoli: The opening address for the Centenary celebrations
Closure of the ANZAC Centenary Stories from Centenary activation events.

Plus many more articles previously published in Amateur Radio magazine and several new stories.

Tune for maximum brightness: An LED antenna current indicator

Peter Parker VK3YE

QRP portable operators often need to know if they are getting out or are correctly tuned up. Many simpler commercial or homebrew rigs don't have inbuilt VSWR indicators and external meters are often too bulky. Besides an indicated 1:1 VSWR is no guarantee of antenna effectiveness.

Before most amateurs used coax feedline or worried about VSWR, a much simpler indication was used. A light bulb, shunted with a small coil of wire, was wired in the antenna line. The output network or antenna coupler was adjusted for maximum current, which was indicated by maximum lightness on the bulb. 1970s solid state Codan transceivers, which needed to be easy enough for the untrained to operate, employed a similar arrangement. The phrase 'tune for maximum brightness' frequently appeared in articles and equipment manuals of the era.

Described is a more modern version, using an LED and ferrite toroid. A useful accessory for QRP portable work, it slips over an end-fed wire antenna just near where it connects to the antenna coupler. The antenna coupler is adjusted for maximum indicated brightness which also coincides with lowest SWR. Consequently, while it gives an indication rather than a measurement, the LED current indicator is a smaller and cheaper substitute for an SWR meter in portable situations where bulk and weight must be kept low. No originality is claimed; the inspiration to build it came from an item on K7HKL's website (<http://sites.google.com/site/arvidevans/>).

No project can be simpler. The ferrite toroid is an unknown

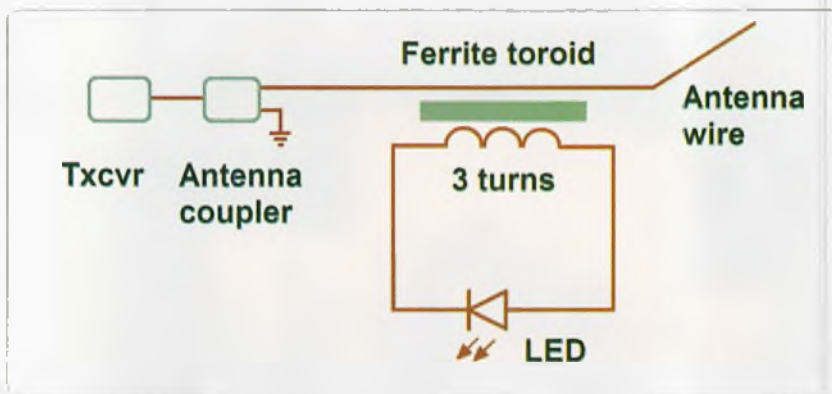


Figure 1: Schematic diagram.

salvaged type. However you could use an FT-50-43 or the smaller FT-37-43. The only thing that matters is its hole must be big enough for the antenna wire to slip through. Figure 1 shows the circuit.

Three turns of enamelled copper wire provide a voltage step-up which drives the LED. Since the signal is AC, the polarity of the LED doesn't matter. Add more turns for more sensitivity and remove turns for less sensitivity. The three turns

used here provided a good indication for power levels between 0.5 and 5 watts. The LED used here is a garden variety 5 mm red type.

If you've got a selection of LEDs an interesting exercise is checking which are the most sensitive. While LED data sheets specify around 20 mA current for full brightness, they turn on at a fraction of a milliamp. I took advantage of this by testing LEDs for maximum sensitivity by comparing brightness of a selection with a 220 k Ω resistor in series with a 12 volt supply.

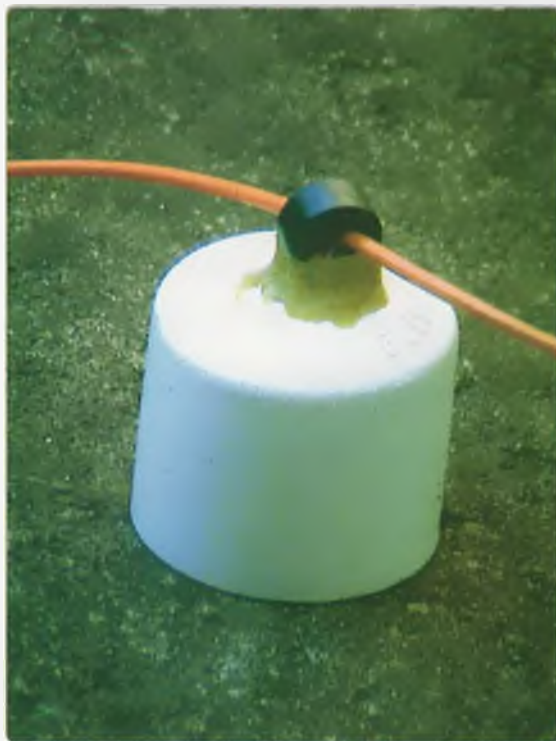


Photo 1: View of toroid.



Photo 2: View of LED.

You could get by with just the toroid's 3-turn winding wired to the LED. Unfortunately that's not robust unless your LED has long enough leads that you can dispense with the enamelled copper wire, slip some insulation on the LED and use that to form the secondary coil around the toroid.

LEDs are often hard to see in bright sunlight. You can overcome that by providing some contrast. I used a white end-cap for PVC pipes. The LED was on the concave side to provide shading. A permanent marker (or paint) can be used to increase contrast and thus visibility, as shown in Photo Two. A black rubber foot from a chair or table is another possibility though its darkness will increase the risk of it being left behind after a night of portable operating.

This relative antenna current indicator has provided good results from 160 metres to the higher HF bands and is highly recommended for the portable operator. More information, including a demonstration, appears in the video at <https://www.youtube.com/watch?v=NjHyXi1SrZs>

WIA DX & operating awards



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

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Switching from the Serial Port, cheaply!

John Sutcliffe VK3TCT

An old friend VK1CJ claims radio amateurs have deep pockets and short arms; if John is half correct this article will suit an amateur radio operator wishing to switch power or maybe PTT by using the space-bar much like 'EchoLink' from an IBM compatible computer serial port. Most of the electronic parts required could be sourced from the junk box and the Q-basic software is free. I have written two Q-basic applications to perform the switching.

The two Q-basic applications are:

- "Comswitch" an application to switch a relay from the serial port, in my case I will use this application to switch on a power supply when running a remote transceiver; the application can be hidden in the system as an .EXE file and run when I wish to bring up the transceiver; somewhat like a key. When the application is run it switches on the relay, switch off by pushing the 'Tilde' "~" key, recommended for closing the program, the 'Tilde' key is the very left/top shifted key on a QWERTY keyboard.
- "Comswitch1" is similar to the previous program and has an additional loop looking for the

space-bar; the object here is to switch the relay off and on by momentary pressing the space-bar which is useful for keying a transmitter, similar to 'EchoLink'. The same conditions apply for terminating the program as "Comswitch" i.e. pressing the 'Tilde' key closes all files and exits the program.

The IBM serial port is an adoption of the RS232 serial protocol with a different name, the original RS232 protocol was designed to run with signal swings from -10 to +10 volts, the actual standard is broader than the levels I have stated but expect these levels. My introduction to RS232 was on Digital Equipment Corporation PDP11 computers

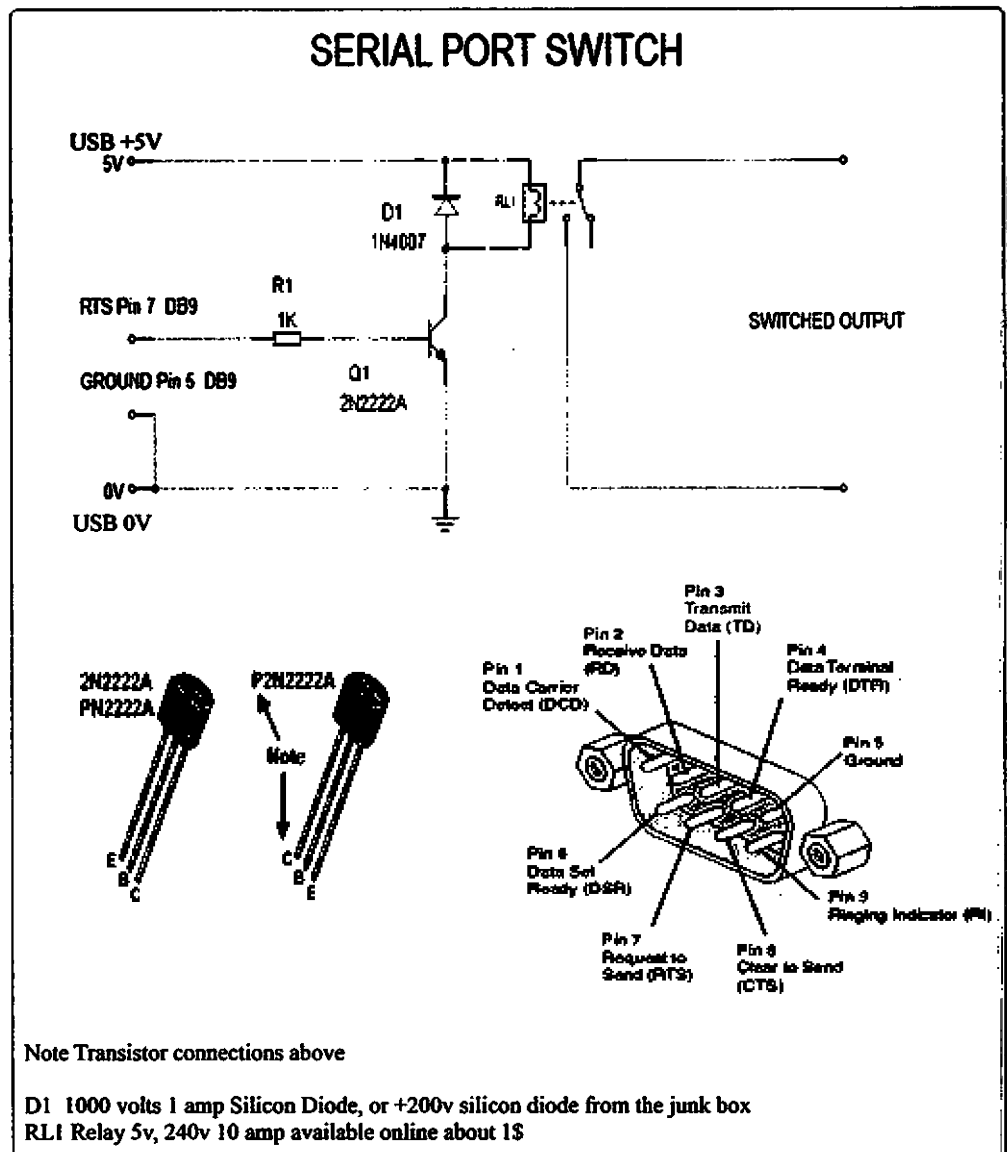


Figure 1: The circuit diagram.

running ASR33 Teletype terminals as I/O terminals.

Today computers are not supplied with RS232 ports (Serial Ports) but they can be added by installing a card into the computer or using a USB to Serial interface cable, both are available online at little cost, be aware that the voltage swings on the USB to Serial interface cables are not always RS232 compatible and are very close to TTL levels (approx. 5 V to 3.5 V,) and expect unpredictable results with some applications using the USB to Serial interface cables. The answer of course is to use an older computer with the ports already installed and the older computer will still run most amateur radio applications.

The small applications that I have written are run using Q-basic a simpler adaptation of quick basic, Q-basic (QB64) can be downloaded freely from the internet at: <http://www.qb64.net/>

For amateur radio operators familiar with downloading computer applications, download and run

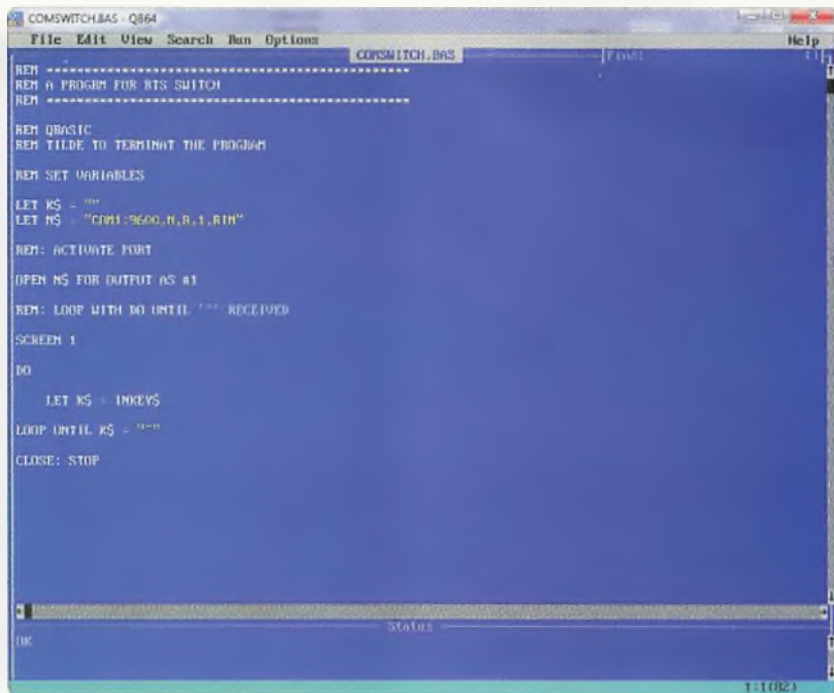


Figure 2: Version 1 of the switching program.

QB64 from the above address (QB64 is free;) a basic program can then be entered and saved, the program will go into the QB64

directory, the program can then be run from the top line by clicking on 'RUN'. When a Basic program runs successfully QB64 will also

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More and more Home Brew parts every month!!!

generate an .EXE file. The .EXE file can be saved to the start menu.

For those wishing to have more detailed instructions follow the indented paragraphs.

- Download and Install the QB64 software from the above site using (Download zip) and select the 'open' option, the file is not saved, select the save option if you wish to save the file. The computer will stop indicating a file at the top of a blank screen, open this file with a double click on the mouse, select qb64.exe and double click with the mouse; the option then is to extract all from the zip file, do this; the computer will then select a default location, use the default location and the computer will then extract all the working files to the location indicated.
- After extraction the computer will again stop with a file at the top

Figure 3: Version 2 of the switching program.

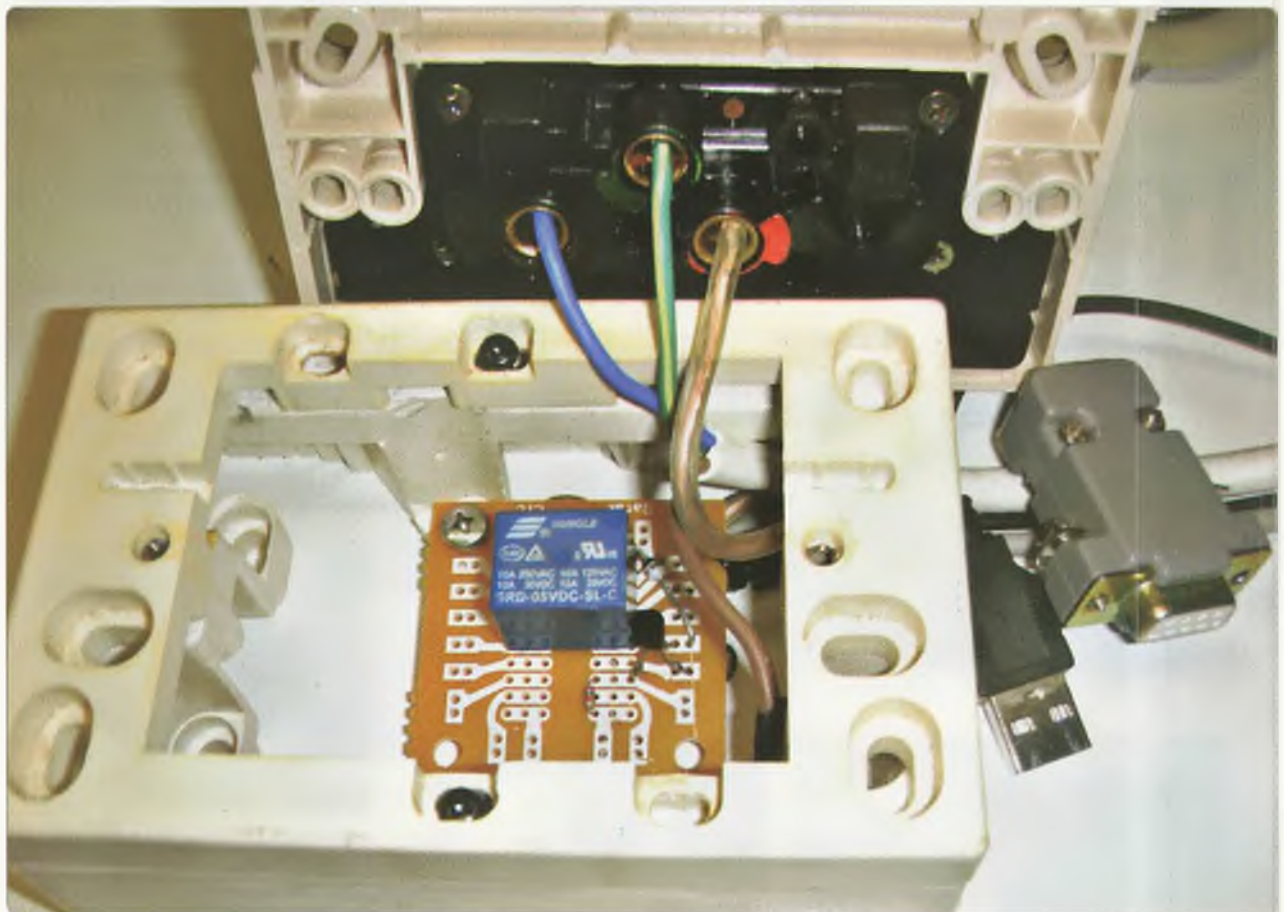


Photo 1: The physical implementation of the circuit.

of the screen, open this folder and QB64.exe is the Q-basic application software you will use; at this point right click on the QB64.exe file and select, pin this file to the start menu, the icon can then be dragged to your main screen if you so desire.

- Double click on the QB64 icon, I get a publisher warning, click run and up will come the QB64 application screen and you are now ready to enter a 'Basic' program.
- Enter the application of your choice, 'Comswitch or Comswitch1 by typing each line carefully. As you enter the program you will get some indicated errors at the bottom of the screen, ignore these until you have completed the entire program entry; the backspace and arrow keys can be used for editing; the software will convert all text to upper case.
- Once the entire program has been entered you should have OK at the bottom of the screen if all is entered correctly, if not the program will indicate the line's that are at fault, the faulty line number includes blank lines, count down and make the necessary corrections, look for things such as 'S' instead of dollar '\$' and colon instead of semicolon.
- Remember QB64 will only work with ports one (1) and two (2) and that is why I have entered this on a separate line, you may have to alter a port number.
- First job is to save the entered file, click on file at the top left of the screen and select 'Save as' enter the desired file name and enter will save the file into the Q-basic directory, now try running the program by clicking 'Run' then 'Start' and 'Run' again and you should have either a blank black screen 'Comswitch' or a blank black screen with 'Push space bar to Transmit' in about the centre of the screen for 'Comswitch1'.
- Q-basic will create .EXE files for each of the programs once it has run correctly, these can be located by using the file locator, click on the 'windows' icon at the

bottom left of you main operating window, enter Comswitch or comswitch1 into the file searcher and they will be listed, drag the appropriate '.EXE' file to your main operating screen and you can run the program without loading 'Qb64'.

Testing the port is straight forward. Pin 7 on the serial plug (port 1) should switch from approx. -10 to +10 volts when Comswitch is run and when the space-bar is pressed running comswitch1; one could use a com port tester, a multimeter or a led lamp with a 1k resistor in series. The led lamp would be very simple as the polarity is not essential, so long as the lamp indicated switching all should be well. **Be aware Qb64 will only operate on ports one and two, also be aware a previous program such as Ham Radio Deluxe can leave the port enabled and must be reset in the control panel for the switch to operate, to reset check the method on 'Google'.**

Building the circuit, not much in this as it is very simple; I built mine on a PCB Prototype board as the relay connections could be brought out to the edge. Most of the components can be found in the junk-box; the diode can be purchased for a few cents just go for a common type such as 1000 PIV by 1 amp, ensure the cathode goes to the supply.

The transistor type I suggested is not mandatory and there are a number in the BC variety such as BC535 and BC431 that would do the job.

The relay I used is a five volt coil type capable of switching 230 volts @ ten amps.

To extract five volts from the USB socket I cut the end of a USB extension cable, in my case the red wire was +5 volts and black 0 volts. You will need a fine soldering iron to connect the cable to pins 7 (RTS) and 5 (Common) on the DB9 female socket and it would pay to use shielded cable with RF around.

Happy switching.

Tech Editor note

If the unit is used to switch mains

HAM RADIO HOUSE

The Boatanchor shop!

www.hamradiohouse.com

Email: hamradiohouse@tpg.com.au

Phone: Stephen - VK2ASC - 0414-392653

Receiving Valves (NOS except as noted)

0B2	\$9.00	6AF4	\$9.00
0AZ	\$9.00	5Y3GT	\$20.00
80N8	\$9.00	5AR4	\$28.00
6AC7(NIB)	\$6.60	13D67	\$9.00
6U8 (A)	\$9.00	12DX6	\$9.00
6X7	\$10.00	12B26	\$20.00
6SH7	\$8.00	12BY7	\$20.00
6SQ7	\$8.00	12BE6	\$13.00
6SC7	\$17.00	12BA6	\$13.00
6SA7	\$8.50	12AX7/	
6K6GT	\$10.00	ECC83	\$35.00
6JH8	\$9.00	12AU7	\$23.00
6H6GT	\$9.00	12AT7	\$18.00
6GK6	\$14.00	12AZ7	\$12.00
6EW6	\$9.00		
6EV7	\$9.00		
6DC6	\$14.00		
6D10	\$19.00		
6CX8	\$8.00		
6CA4	\$25.00		
6BZ6	\$10.00		
6BV8	\$12.00		
6BN8	\$15.00		
6BE6	\$8.50		
6AW8	\$8.50		
6AL6A	\$10.00		
6AQ5A	\$10.00		
6AN8	\$10.00		

Transmitting Valves

6146B Nos	\$48.00
6146B Ch	\$30.00
G-807	\$15.00
6DQ5	\$20.00

Caps, valves avail.

N:PL259;PL259:N



\$4.40 each

Racal RA-17



\$990

Drake R4C +T4XC MS4+AC4+acc



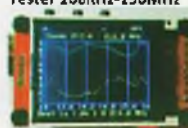
\$1275

ZL1CVD Boatanchor DDS VFO - assembled



\$98

"TenaTesta" Antenna Tester 100KHz-150MHz



\$88

voltage, the relay must be specified to handle these voltages. Also ensure there is no possibility that the AC wiring can come into contact with the control wiring. Any failure here will result in serious damage to the connected computer and in the worst case death of the operator.

It is good practice to connect a diode between the base and emitter of the transistor to prevent reverse breakdown of this junction when a reverse voltage is applied, as will be the case when the RS232 line swings negative. Just about any diode will do: e.g. an 1N4148 or any of the 1N4000 series 1 amp diodes: Cathode to the base.

Build your own latest WSJT-X release

Steve Ireland VK3VM / VK3SIR

Amateurs traditionally like to be the "new kids on the block" when it comes to technology. Likewise there has been considerable interest in the software "WSJT-X" developed by Nobel Laureate Joe Taylor K1JT.

Joe has standard "approved" versions of WSJT-X as well as his other tools WSJT, MAP65 and WSPR available at his home website <http://physics.princeton.edu/pulsar/k1jt/index.html>. At the time of writing, Joe's current release version of WSJT-X was at version 1.6. Yet many amateurs will be aware that when you log into sites that report contacts, such as <http://pskreporter.info>, it will be noted that some Amateurs are using versions as late as Version 1.7 release 6618 (current at time of writing).

There has been a considerable number of new radios released recently – namely the Yaesu FT-991 and the Icom IC-7300. Yet the Version 1.6 as released on Joe K1JT's website does not support these radios or if it does, not properly – yet you also observe on <http://pskreporter.info> that people are successfully using these radios with this software.

In addition it is widely known that "hacked" versions of WSJT-X are commonly in use for activities such as "High Altitude Balloon" tracking. One such example of a "hacked" version of WSJT-X that is used can be downloaded through the "PicoSpace" group at <http://picospace.net/?p=552>

This raises the following questions:

- How are amateurs obtaining this latest software that supports the latest radios?
- How are amateurs "hacking" the software for specialist applications, such as High Altitude Balloon tracking?
- How can you contribute to this software?

The focus of this article will be on guiding interested amateurs with regards to downloading and deploying the JTSDK – The "Joe Taylor" modes Software Developers Kit and then on building the software itself. Using the kit and modifying the software is way beyond the parameters and scope of this article. But here I aim to explain how get, deploy, compile and finally install software compiled and made available through the JTSDK.

Disclaimer

The following has been released by the ARRL <http://www.arrl.org/arrlletter?issue=2015-09-24#toc08>:

Nobel Laureate Joe Taylor K1JT, the developer of the popular WSJT "weak-signal communication" software suite is advising users to avoid what he called "unauthorized" versions of his software. He said problems could result by using these builds on the air, and any results that might be shared with the broader user community would be unhelpful.

"Third-party individuals – i.e., others not part of the WSJT development team -- have been compiling WSJT-X from the open-source code and making unauthorized 'releases' of their builds," Taylor said September 8 in a discussion of WSJT-X "fast modes" on his website. "I do not recommend use of these builds on the air. If you operate with one of these unauthorized 'rXXXX' code revisions in our experimental code branch, you have no idea what you've got." Subsequent observations regarding what does or does not work, he said, then become "worse than useless. [T]hey waste your time and ours."

(Source: <http://www.arrl.org/arrlletter?issue=2015-09-24#toc08> accessed 13/4/16)

There is also the risk in the process of some undesirable product – possibly interference – being introduced through a beta version.

But conversely, there is also the advantage of additional support and vastly improved resolution of weak signals.

One must of course exercise extreme caution when deploying and using this software. You must stick to the rules: test, monitor, and continue monitoring. Openly accept constructive criticism and desist using the new versions if problems are identified.

Overview of the JTSDK

The "Joe Taylor Software Developers' kit" is a set of integrated and complete packaged tools that can be utilised to download, compile and deploy the JTSDK for Windows and Linux. Every tool and component that you need is able to be retrieved and compiled through this complete Developers' Kit. There is nothing that you need to purchase – all is "open source".

This article will concentrate on deploying the JTSDK under Windows. The actual build and design methodology is Linux-based. The JTSDK for Windows is actually a multiple set of tools and code libraries that allows these Linux/Unix based utilities and libraries to work under a Windows Environ.

Obtaining the JTSDK

The JTSDK can be obtained from <https://sourceforge.net/projects/jtsdk/>

The current set of installers for the Windows ("Win32" – version 2.0.0) can be directly accessed at <https://sourceforge.net/projects/jtsdk/files/win32/2.0.0/>

It is extremely important that you read and follow the information provided at <https://sourceforge.net/>

[projects/jtsdk/files/win32/2.0.0/](https://sourceforge.net/projects/jtsdk/files/win32/2.0.0/) before commencing. This page contains all the information required, in sequence, to download, deploy and update the SDK (at Version 2.0.4 at time of writing). In addition, under the section “Basic Compiling Instructions”, a sequence of steps is provided that you can use to compile Hamlib Version 3. Hamlib Version 3 (Hamlib3) is an essential rig communication library.

Once installed the entire SDK will take up approximately 7.25 GB of hard drive space. I would also recommend compiling the system on a 64-bit Windows deployment (Windows 10) with at least a dual-core processor and 8 GB of RAM. Any programming/compiling tasks are processor intensive.

Installation of the JTSDK

This section summarises resources at <https://sourceforge.net/projects/jtsdk/files/win32/2.0.0/> Please refer to this page for the latest set of instructions.

Obtaining the required Installation Packages and Updates

You should pre-download the following files and/or any additional files (if listed):

MS-Vcredist (2010)	Visual C++ 2010 Windows Libraries	8.57 MB
MS-Vcredist (2013)	Visual C++ 2013 Windows Libraries	6.20 MB
OmniRig	A “Universal Rig” driver written by Alex Shovkopyas, VE3NEA	727 KB
JTSDK-2.0.0-win32.exe	Main JTSDK Installer	682.0 MB
JTSDK-2.0.0-u1-win32.exe	Update 1	12.1 MB
JTSDK-2.0.0-u2-win32.exe	QT 5.5 and GCC 4.9 updates – Update 2	634.5 MB
JTSDK-2.0.0-u3-win32.exe	Ruby and Ascidoctor – Update 3	16.5 MB
JTSDK-2.0.0-u4-win32.exe	Installation and Script Updates – Update 4	304.8 kB

Some of these updates are not considered critical – but it is important to download each of these and deploy each package in the sequence listed above from my working experience with the products.

Some of these updates are quite large; others that may seem small can also pull files from “The Internet”. Please allow, as a guide, at least an hour to perform the entire set of activities once downloaded.

Updating the Installation

Once installed it is critical that updates be performed and scripts run to enact the upgrades of the resources. For Windows 8.x/10 the steps should be similar to:

- Left-click on the Windows Home Icon on the desktop (lower left corner)
- Select All Apps,
- scroll, down to “J”
- Select “JTSDK” / “JTSDK Maintenance”

This will open a “command shell” using command sets that is “Unix-like”. At this command prompt (C:\JTSDK>) type the following commands:

- update ← Packages from the Internet will be downloaded
- upgrade ← This will pre-download the latest source files for all the software that can be compiled under the JTSDK.

It is recommended that you perform these last two steps often – if not before you attempt to recompile the software – as changes are posted regularly.

On completion of the final “upgrade: set the JTSDK should now be deployed, updated and primed with the latest software source files all ready to be built.

Building WSJT-X

Preparation: Building and Deploying the Hamlib v3 Rig Libraries

Before WSJT-X or any other software can be deployed the Hamlib3 Rig Control software and libraries must be downloaded, compiled and then deployed. It is this often-changing software that provides the support for your latest rig (i.e. FT-991 or IC-7300). It is vital that you keep this software almost up-to-the-minute with regards to its release on your systems.

Perform the following steps:

- Click on the “JTSDK-MSYS” Icon on your desktop
- On first execution this should set up a “pseudo Unix-command-line-like” environment. It may require you to close and reopen this window again.

At the command prompt (similar to user@machinename~\$) type the following command:

- build-hamlib3

A long set of scripts should run. Execution may take 10-15 minutes. These scripts download the latest Hamlib Libraries, prepare the compiler environment, compile and then deploy the Hamlib libraries so that other software can use these software libraries.

On completion, close the “JTSDK-MSYS” environment window.

Building WSJT-X

Once Hamlib Version 3 is deployed the process of actually building a version of WSJT-X is relatively simple.

- Open “JTSDK-QT” by clicking on the Desktop Icon or using the Start Menu

At the C:\JTSDK prompt type the following command:

- build-wsjtx package

Note: The instructions at <https://sourceforge.net/projects/jtsdk/files/win32/2.0.0/> suggest typing build-wsjtx rinstall . The advantage of the method that I have detailed is that the JTSDK will produce a self-extracting installer in .exe format that will create a portable version of the software. This installer can be copied to other machines and deployed there.

A long set of scripts should run. Execution may take 10-15 minutes.

On completion, the saved path of the completed installer for WSJT-X should be able to be found in the location displayed on the screen.

- Make a note of this location.
- Close the "JTSDK-QT" window.

If you installed the JTSDK in your root directory (recommended) then you should find the EXE file wsjtx-1.7.0-devel-win32.exe in the following location:

- C:\JTSDK\wsjtx\devel\qt52\1.7.0\Release\package

Use the file explorer to locate this file

- Right-Click on the Windows Home Menu
- Select File Explorer
- Navigate to "C:\JTSDK\wsjtx\devel\qt52\1.7.0\Release\package"

You now have in front of you the completed, compiled, up-to-the-minute version of WSJT-X ready to install.

Deploying WSJT-X

You should now be able to execute this self-installing file to deploy WSJT-X to your favourite location on your system.

Installation and usage of this package is beyond this article. If you are unsure of how to use this package then you should seek assistance from a good YouTube video or a good competent Amateur from your local Amateur Radio Club.

Other "Joe Taylor" programs that can be built

In addition the packages "WSJT", "WSPRX" and "MAP65" can be built.

Instructions to compile and deploy these packages can be found within the embedded information displayed on the main utility screens (i.e. "JTSDK-PY" if executed) or within the documentation provided at <https://sourceforge.net/projects/jtsdk/files/win32/2.0.0/>

Conclusion

WSJT-X and the suite of associated packages have found considerable utility and are extremely popular now as the preferred digital mode of choice for many amateurs. The whole codebase is extremely well packaged and the code is easily adapted for specialist applications, such as High Altitude Balloon tracking.

Amateur radio is also about technology and about adaptation. The WSJT-X suite has proven itself to be highly extensible and adaptable and therefore has found considerable utility in the community.

Be careful when using this software not to over-drive levels into the radio; check that signal processors are off and that ALC is not cutting in when you transmit (the subject of a previous article).

73

Steve Ireland VK3VM / VK3SIR
Assessor: 3-072

AR



WYONG FIELD DAY

26th February 2017

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Waverley Amateur Radio Society at Macquarie Lighthouse and Hornby Lighthouse, Sydney, ILLW 2016

Fred Lodden VK2EFL for the Waverley Amateur Radio Society

Macquarie Lighthouse (AU0022)

On Saturday 20 August 2016, the Waverley Amateur Radio Society (VK2BV) celebrated the 96th anniversary of its first licence (N249) granted on 18 August 1920, by activating the Macquarie Lighthouse in Vaucluse, Sydney. It is fitting that Australia's oldest continually licensed amateur radio club activated Macquarie Lighthouse, the site of Australia's oldest navigation aid. There has been a navigation aid on this site since 1791 with the first lighthouse built in 1818 and the current lighthouse in 1883.

The club had arranged access to the Macquarie Lighthouse from 0700 to 1600 local and members arranged to meet at 0730 on Saturday morning to begin setting up antennas and equipment. The plan was to erect dipole antennas on 20 m and 40 m, oriented at 90 degrees to each other to minimise cross interference. There is a large mown area surrounding the lighthouse providing a generous area for antenna erection. We had access to the upper balcony level of the lighthouse and used that as a support for one end of each dipole. The club used a portable mast of some 15 m height to support the other end of the 40 m dipole and used a fence of the adjoining property as the support for the other end of the 20 m dipole. A 2 m / 70 cm vertical was also lashed to the top balcony to provide a facility for those bands. Jonathan VK2FJTA positioned his vehicle on the grounds outside the building. He has a mobile setup with a HF



Photo 1: Laurie VK2GZ on the upper balcony with rope in one hand and a HT in the other hand, for co-ordination with the ground crew. I hope he hurled the correct one over the railing.

rig installed in his 4WD. Jonathon is still fine tuning the setup and was keen to get some practise on HF and compare his experience

with the other radios being used in the lighthouse. To provide a little sound isolation in what is otherwise a hard stone building where any



Photo 2: And this is the view to the west from the balcony of the Macquarie Lighthouse, with the Sydney CBD, Opera House, Harbour Bridge and buildings in North Sydney and Chatswood on the horizon.

sound travels and echoes within the building, the three stations were each set up in a different room on the ground floor of the lighthouse.

Operations commenced at 1000 local and there was good activity on the HF bands. There weren't all that many contacts to be made on VHF or UHF. 20 m was OK and I heard

Tony VK2KZ trying to establish a QSO with a JA station. 40 m had a considerable level of background noise and many operators that we had QSOs with from all around VK and ZL commented about the QRM, so it wasn't just a Sydney phenomenon. Skip VK2ALR worked quite a few CW QSOs on 40 m.

Photo 3: Skip VK2ALR working a CW contact on 40 m.



Because we had the front door of the lighthouse open all day and the fact that it is located right alongside a very popular walking pathway that goes along the cliff edge, we spoke to a number of passers-by who stopped to see what we were up to. We took the time to explain what the activity was all about and everyone I spoke to left with a WARS introductory brochure in their hand.

EME Group (The Space Cadets)

WARS have an Earth-Moon-Earth and space communications special interest group. We took advantage of the Macquarie Lighthouse location to conduct some tests across an overwater path to characterise the receiving equipment and determine its suitability for EME activities.

At the Macquarie Lighthouse, it was intended to mount a 6-element Yagi for 2 m on the upper balcony pointing north. Alex VK2PSF was scheduled to go to Avalon on Sydney's northern beaches with a portable setup comprising a KX3, a laptop, antenna and an attenuator and from

there transmit varying power levels into a quarter wave vertical. The distance between the two stations was 22 km.

At the Macquarie Lighthouse things didn't quite go to plan, as we were unable to mount the Yagi on the upper balcony. It physically would not fit through the access hatchway and it was too windy to try and haul it up the exterior of the lighthouse. So the Yagi was fitted to a seven metre fibreglass pole lashed to the boundary fence and receive testing was done at ground level. There was a clear view to the north, but the antenna height was about 15 m lower than planned.

The testing went exceptionally well. The JT65 signal from VK2PSF was easily received, even as the transmit power was reduced to 100 mW. When a 20 dB attenuator was fitted (so just 1 mW into the antenna), the signal was still S9. Only rotating the receive Yagi, first 45 degrees off beam, then 90 and 180 degrees, caused the signal to reduce below S9. So, the results are being analysed.

Hornby Lighthouse (AU0041)

Another WARS member, Grant VK2GEL, separately activated the Hornby Lighthouse. This lighthouse is right on the tip of South Head on Sydney Harbour and a mere 2 km



Photo 4: Tony VK2KZ working 20 m: Unfortunately, during the afternoon the power supply in the foreground produced a bit of a 'bang' and released the smoke. A little troubleshooting was unable to reveal the offending component and a spare power supply was pressed into service so that operations could continue.

north of the Macquarie Lighthouse. It is accessible only on foot. Interestingly Hornby Lighthouse is also within the Sydney Harbour Foreshore National Park and Grant used the occasion for a dual purpose. He activated the location as both a lighthouse and as a national park for World Wide Flora and Fauna. Operations at the Macquarie Lighthouse concluded at around 1530 and we had packed things up before 1600.

The Macquarie Lighthouse team: Laurie Gordon VK2GZ, Tony Monger VK2KZ, Skip Hodgson VK2ALR, Rob Halliday VK2XRH, Fred Lodden VK2EFL, Jonathan Adami VK2FJTA, Alan Hirschel VK2KAM, Eric van de Weyer VK2VE and Alex Stewart VK2PSF at Avalon.

At Hornby Lighthouse, Grant La Delle VK2GEL.



Photo 5: On the grounds of the lighthouse is the extendable portable mast, with dipole antenna and guy ropes fastened. On the right is VK2FJTA's vehicle with mobile HF rig.



IARU Liaison Report

Jim Linton VK3PC
e iaru@wia.org.au

Retiring IARU Secretary honoured

The International Amateur Radio Union (IARU) has awarded the outgoing IARU Secretary Rod Stafford W6ROD with the Michael J. Owen Memorial Award.

The Owen Award is named after Michael VK3KI (SK) who died in 2012 while serving the IARU Region 3 as its chair and being President of the Wireless Institute of Australia (WIA).

He may be best remembered for his WRC-03 work on Article 25 – revising the International Radio Regulations specific to the Amateur and Amateur-Satellite Services. His career of involvement began in the early 1960s.

Presenting the award at a dinner on the opening day of the IARU Region 2 General Assembly in Chile was IARU President Tim Ellam VE6SH. Obviously surprised, Rod W6ROD was very grateful for being considered worthy of the honour, describing Michael VK3KI as well remembered and himself an example of dedication to the interest of our hobby.

The Owen Award is bestowed upon an individual with "an outstanding trajectory of service to Amateur Radio."

Although Rod Stafford W6ROD has stepped down as IARU Secretary after seven years, Tim VE6SH appointed him as the Emergency Communications Special Advisor.

He will represent IARU interests in the ITU Development Sector, offering advice and counsel on



Rod W6ROD (left) receives the Owen Award from IARU President Tim VE6SH/G4HUA)

matters relating to emergency and disaster response communications.

The former ARRL CEO David Sumner K1ZZ, who has served twice previously as Secretary, joins the other voluntary IARU officers and Administrative Council members.

IARU R2 Conference

On alternate years each IARU region has a conference, the latest being Region 2 in Chile on October 10-14 2016 with the Radio Club of Chile hosting the bilingual affair with simultaneous English and Spanish translations.

Attending from throughout the Americas were 24 member societies with 13 of them by proxy, plus representatives from the IARU AC, Regions 1 and Region 3.

The President, Reinaldo Leandro YV5AM, told the conference of the recent passing of the King of Thailand Bhumibol Adulyadej HS1A, patron of the Radio Amateur Society of Thailand (RAST), who was once a very active and appreciated radio amateur.

The conference held a minute's silence to honour HS1A. The IARU R2 has sent RAST a condolence message.

The conference formed working groups to handle a busy agenda that was grouped in topics that included administrative and spectrum issues; then recommendations were made to the entire conference meeting in a plenary session.

Among the subjects was the IARU R2 HF Band Plan. The conference accepted the recommendations for an ongoing planning process rather than a three-yearly update and progressively in consultation with the other two regions, to move towards a single global band plan.

It also resolved that the IARU R2 would ask CITEL (Inter-American Telecommunications Commission) to adhere to the reciprocal and automatic operation by radio amateurs.

The Federación Mexicana de Radioexperimentadores was supported by a unanimous resolution to have the Mexican government allow foreign radio amateurs to operate.

The IARU plan for WRC-19 was discussed with member societies to ask for meetings with their administrations to discuss the agenda and obtain their support in the pre-planning process.

During a break a delegation from the conference visited Chile's Congress where they met with

some Chilean Senators to talk mainly about providing emergency communications.

In the television coverage of the meeting, IARU President Reinaldo YV5AM explained the role of radio amateurs in time of disaster. Senate President Ricardo W. Lagos agreed that radio amateurs provided emergency communications and he was in praise of that role when an emergency or disaster hit Chile.

The meeting also discussed a proposed Memoranda of Understanding (MoU) to support and protect amateur allocations in Chile.

Returning to the conference for the final plenary session, IARU R2 President Reinaldo Leandro YV5AM encouraged more active involvement and thanked the coordinators and volunteers that made the conference a success.

The 20th IARU R2 conference will be hosted by Radio Club Peruano in Lima Peru in 2019.

Emcomm workshop discusses the issues

The second gathering of those involved emergency communications for the Americas was held on October 11 2016 with 30% more participants when compared with the same conference Mexico 2013.

The workshop, co-chaired by the IARU Region 2 Coordinator Cesar Pio Santos HR2P and ARRL Emergency Preparedness Manager Mike Corey K11U, was sponsored by the IARU and ARRL and coincided with the IARU Region 2 conference.

There were many speakers on international issues facing Amateur Radio's response to emergencies and disasters. Major presentations included those from the radio societies of Chile, Mexico and Venezuela; Salvation Army Team Emergency Radio Network; International Telecommunications Union; and the Amateur Radio Emergency Data Network.

Discussion both inside and outside the workshop were on the themes discussed in the first workshop, as well as new focus areas to address.

It included greater public education on the value of Amateur Radio; cross border exercises to provide practice for large scale disasters; and proposed an online library for all engaged or wanting to be involved.

Spanish video of IARU R2 delegates at the Chile Congress: <https://youtu.be/W5OEDxlyqEc>

Emcomm workshop report: www.iaru-r2.org/wp-content/uploads/Press-Release-English.pdf

Over to you

A letter to the Editor.

A Mobile phone 'booster'

I would be interested to hear from WIA members who have poor mobile phone reception: at present I am experimenting with a homebrew passive booster in my backyard to boost my reception on 3G and 4G.

The setup I have here - which is highly experimental - consists of a UHF TV antenna (probably way off resonance for 3G and 4G) and I have cabled it directly to a 'broomstick' antenna that is commonly used on cars.

I think the broomstick is a vertical collinear antenna.

The reception here on my block in Albury is usually very poor and rarely gives one dot on the phone's signal indicator (S-meter). Yet we are at most three kilometres from the nearest cell phone tower - and there are a few of them in the town here.

So far I think I have managed to get the signal up a bit so that 2 or 3 dots show on

the S-meter and the phone works in some places in the house and garden where it was previously unusable.

I am wondering what other users have found in the way of passive boosters.

(I am aware that active boosters are not permitted by ACMA, except under certain circumstances.)

73,

Scotty VK2KE.

DX Awards

Marc Hillman VK3OHM

Below are listed all New awards issued in October 2016, plus all updates to DXCC awards. Go to <http://www.wia.org.au/members/wiadxawards/about/> to use the online award system.

New awards

DXCC Multi-band (1)

#	Call	Name	Mode	Band	Count
144	VK3TCT	John Sutcliffe	Digital	20 m	106
145	VK2RT	Bruce Beresford	Open	20 m	116

DXCC Multi-mode (Digital)

#	Call	Name	Count
57	VK3VH	Shaun Stoddart	101
58	VK2RT	Bruce Beresford	104

DXCC Multi-mode (Open)

#	Call	Name	Count
441	VK2MWG	William McCarron	275

Grid Square

#	Call	Name	Mode	Band
258	VK4FFAB	Rob Powell	Open	HF

IARU Worked All Continents (Basic)

#	Call	Name	Mode	Band
73	VK2RT	Bruce Beresford	Open	

Norfolk Island

#	Call	Name
27	VK9NG	Grahame O'Brien
28	VK3KG	Craig Cook

Worked All VK Call Areas HF

#	Call	Name	Mode
2364	EA6ARC	John Saunders	Open

Our SWL contributor has retired.

Are you able to put together regular contributions on this subject? Please read the information on how to contribute. <http://www.wia.org.au/members/armag/contributing/> and then send an expression of interest outlining your interest to: armag@wia.org.au

DXCC updates

DXCC Multi-band (1)

#	Call	Name	Mode	Band	Count
33	VK4TJF	James Fleming	CW	20 m	139
43	VK7CW	Steven Salvia	CW	20 m	265
45	VK2MWG	William McCarron	Digital	20 m	127
54	VK3EW	David McAulay	Digital	20 m	172
140	VK6XT	Richard Hill	Digital	20 m	106
27	VK5DG	David Giles	Open	20 m	146
32	VK4TJF	James Fleming	Open	20 m	181
41	VK7CW	Steven Salvia	Open	20 m	304
44	VK2MWG	William McCarron	Open	20 m	248
81	VK6APK	Aleksandar Petkovic	Open	20 m	281
87	VK6XT	Richard Hill	Open	20 m	138
99	VK3TCT	John Sutcliffe	Open	20 m	112
28	VK5DG	David Giles	Phone	20 m	117
36	VK4TJF	James Fleming	Phone	20 m	135
39	VK6WX	Wesley Beck	Phone	20 m	147
46	VK2MWG	William McCarron	Phone	20 m	235
98	VK3VH	Shaun Stoddart	Phone	20 m	175

DXCC Multi-band (3)

#	Call	Name	Mode	Band	Count
37	VK7CW	Steven Salvia	CW	30-20-17 m	717
70	VK3VH	Shaun Stoddart	CW	40-20-15 m	371
66	VK3EW	David McAulay	Digital	30-20-15 m	427
16	VK2MWG	William McCarron	Open	20-15-10 m	578
30	VK3SX	Bob Robinson	Open	20-15-10 m	670
36	VK7CW	Steven Salvia	Open	20-17-15 m	765
42	VK5DG	David Giles	Open	20-15-10 m	374
59	VK6APK	Aleksandar Petkovic	Open	40-30-20 m	694
65	VK3VH	Shaun Stoddart	Open	40-20-15 m	582
31	VK3SX	Bob Robinson	Phone	20-15-10 m	663
38	VK2MWG	William McCarron	Phone	20-15-10 m	539
60	VK6APK	Aleksandar Petkovic	Phone	40-20-10 m	494
72	VK7CW	Steven Salvia	Phone	20-15-10 m	498

DXCC Multi-band (5)

#	Call	Name	Mode	Band	Count
35	VK7CW	Steven Salvia	CW	30-20-17-15-12 m	1089
64	DHBLXT	Velko Pennala	CW	20-17-15-12-10 m	815
34	VK7CW	Steven Salvia	Open	30-20-17-15-10 m	1175
43	VK6APK	Aleksandar Petkovic	Open	40-30-20-15-10 m	940
47	VK3SX	Bob Robinson	Open	40-20-17-15-10 m	902
52	VK3SX	Bob Robinson	Phone	40-20-17-15-10 m	880

DXCC Multi-band (7)

#	Call	Name	Mode	Band	Count
10	VK3EW	David McAulay	CW	160-40-30-20-17-15-12 m	1681
14	VK7CW	Steven Salvia	CW	40-30-20-17-15-12-10 m	1430
15	VK7CW	Steven Salvia	Open	40-30-20-17-15-12-10 m	1527
23	VK6APK	Aleksandar Petkovic	Open	80-40-30-20-17-15-10 m	1153

DXCC Multi-band (9)

#	Call	Name	Mode	Band	Count
12	VK3EW	David McAulay	CW	160-80-40-30-20-17-15-12-10 m	1984
1	VK3EW	David McAulay	Open	160-80-40-30-20-17-15-12-10 m	2764

DXCC Multi-mode (CW)

#	Call	Name	Count
207	VK4TJF	James Fleming	171
217	VK3VT	Greg Williams	261
227	VK6APK	Aleksandar Petkovic	288
231	VK3VH	Shaun Stoddart	239
243	VK3WE	Rhett Donnan	105

DXCC Multi-mode (Digital)

#	Call	Name	Count
20	VK3EW	David McAulay	265
22	VK5DG	David Giles	143
25	VK3OHM	Marc Hillman	143
26	VK3VT	Greg Williams	164
31	VK6XT	Richard Hill	137
33	VK7CW	Steven Salvia	126

DXCC Multi-mode (Open)

#	Call	Name	Count
345	VK4TJF	James Fleming	200
363	VK3OHM	Marc Hillman	237
381	VK3VT	Greg Williams	309
386	VK6XT	Richard Hill	200
415	VK3VH	Shaun Stoddart	286
431	VK2RT	Bruce Beresford	131
435	JK1CYF	Toshiya Toba	126

DXCC Multi-mode (Phone)

#	Call	Name	Count
545	VK4TJF	James Fleming	150
569	VK3OHM	Marc Hillman	215



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.

Four directors retire at the conclusion of the next Annual General Meeting which will be held in South Australia, 20th May 2017, namely Roger Harrison, Ewan McLeod, Robert Broomhead and Fred Swainston. Each retiring director is eligible for re-election.

Nominations are called for from others also 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 licence.

Any person wishing to nominate 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 2017:

A statement signed by the candidate signifying his or her willingness to be a candidate for election as a director together with;
the full name, age, occupation 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.

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

Unit 20
11-13 Havelock Road
Bayswater
Victoria 3153

or by mail to:
PO Box 2042
Bayswater
Victoria 3153

Nominations received by facsimile or by electronic means cannot be accepted.

John Marshall
WIA Returning Officer

Don't forget



Don't forget to register for **MEMNET**.



DXTalk

Luke Steele VK3HU

The solar activity remained low for October, but it did pick up somewhat in the middle of the month. There was a nice bit of DX as high as 15 m into Europe around midnight. Late in the month, the recurrent coronal hole high speed stream influenced our magnetosphere, resulting in more geomagnetic storms.

Again there was little action on 12 and 10 m, with 15 and 17 m showing some activity. Twenty metres still provides good opportunities to most parts of the world, most days. Europe comes in with many strong signals on 20 m long path later in the afternoon, and into the evening. Thirty and 40 m are quite good, and 80 and 160 m are working reasonably well most days.

There has been a large number of DXpeditions during October and into November. In our region there was VK9NZ Norfolk Island, VK9LX Lord Howe Island, H44GC Solomon Islands and H40GC Temotu Province, 5W Samoa, T31T Central Kiribati, V6Z Micronesia, and T2J Tuvalu with Nob and Ken continuing their Pacific DXpedition. In Asia were 3W2RR Vietnam, XU7MDC and XU7AMD Cambodia, and 9N7ZT Nepal.

Monk Apollo, recovering from surgery, spent some time on air 8 - 10 October, and was heard here in the late afternoons on 20 m SSB and CW. It was reported that his callsign was pirated on 16 - 18 and possibly 22 - 23 October, when he was back in hospital for further treatment.

S21SM Syed has been quite active recently from Bangladesh. He



The Bulgarian All Saints Award certificate.

has been mainly on 15 m in our late afternoons/early evenings.

TZ4AM Jeff has been quite active on CW from Mali. He calls for VK at times, and puts in a decent

signal here. There has been little activity from Mali for some years, so it is good to see Jeff flying the flag there.

9J2BO Brian also shows up

regularly from Lusaka, Zambia. He is usually on CW, but sometimes uses SSB.

HC2AO Alex is on air most days from Ecuador. He prefers to operate CW and likes to operate the Low Bands.

Conditions should pick up somewhat over summer, with the higher bands usually improving over this time under seasonal influences. Lower bands will be generally noisier, due to storm activity increasing over summer, but should see more activity and better propagation.

Bulgarian Saints Award

Each year the Bulgarian radio club Blagovestnik runs the "Bulgarian All Saints Award", where each month, a saint in the Orthodox Church is commemorated by a special event station. An attractive award certificate is available free of charge via email, upon submission of a log showing at least five different memorial call signs. For more information, visit the club's website. <http://www.lz1kcp.com/>

Upcoming DX

After the very busy time with so many DXpeditions taking place in October and November, December and January looks very quiet, with only a handful of activations listed. This time is very good for DX, with a lot of DXers having holidays, and the time to spend on the radio, in which are generally favourable conditions. The frenetic "short QSO" of DXpeditions and Contests give way to more relaxed exchanges of the season's greetings. Enjoy this period of goodwill, and get on air. DXers overseas love working Australia!

DXpedition activity scheduled for December and January includes the following:

J3/VE7ACN, Grenada, 30 Nov - 8 Dec. Mike VE7ACN will be operating holiday-style from Carriacou Island (NA-147) on 40 - 10 m, mainly CW, some SSB and maybe 80 m. QSL via LotW, or VE7ACN via bureau or direct.

FS, Saint Martin, 1 - 11 Dec. (NA-199). K9NU, N9TK, W9ILY and K9EL, signing as FS/home call, will be on air for the CQ 160 m Contest with three stations.

E44QX, Palestine, 8 - 12 Dec. Bodo DF8DX plans to operate holiday-style from Jericho, West Bank, using 100 watts from an IC-706 into a vertical antenna. He'll be mainly on CW, and will upload his log daily to Club Log. QSL via LotW, or via bureau or direct to DF8DX.

VP5/VE7ACN, Turks & Caicos, 10 - 19 Dec. Mike will continue his holiday in Grand Turk Island (NA-003), on 40 - 10 m, mainly CW, some SSB and maybe 80 m. QSL via LotW, or VE7ACN via bureau or direct.

V63 Micronesia, 4 - 22 Jan. JA3ARJ (V63ARJ), JH3LSS (V63LSS), JA3AVO (V63AVO), JH3PBL (V63PBL) and W7AYA (V63AYA) will be active from Pohnpei (OC-010), on 160 - 6 m, CW, SSB and digital modes. QSL via home calls.

E51AMF, North Cook, 11 Jan - 6 Feb. Bengt-Erik K7ADD will be spending four weeks on Manihiki Atoll (OC-014), which is in the North Cook group, a separate entity to South Cook which sees regular activity from Rarotonga resident amateurs. Bengt-Erik plans activity 160 - 10 m in CW, SSB and RTTY with 1.5 kW and vertical antennas. QSL via LotW, Club Log, eQSL, or via K7ADD direct. For more information see his website. <http://e51amf.amateurfoundation.org/>

VK5CE/3, Gabo Island (OC-196), 31 Jan - 1 Feb. Craig VK5CE will be activating Gabo Island, mainly on 20 m, but also 15 - 40 m as openings present. This will be quite a costly trip for Craig, with a long drive, a private aircraft charter to get to the island, and expensive accommodation there, so any contributions will be appreciated. For more information on this IOTA activity, see Craig's website. <https://oc196.wordpress.com/>

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

Other news

The T31T Central Kiribati "Rebel DX Group" DXpedition led by Dom 3Z9DX made around 30,000 QSO, including around 5,000 with Europe, where the demand for this one is still very high. Dom plans to return to Kanton Island next year to "finish the job". As a result of this activity from Central Kiribati, the planned T31W "Perseverance DX Group" DXpedition has been cancelled. The Perseverance DX Group has been working on permission to activate couple of other Pacific entities, so we look forward to hearing their alternate plan for next year.

Pirate Hassan is still very active again as Y11H, and a few other call signs. Other Iraqis are now on air fairly regularly, so look out for them. See QRZ.com for information on stations heard, or spotted on the DX Cluster Network.

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

73 and good DX,
Luke VK3HJ

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

Christine Taylor VK5CTY

Buy and Sell

This will be over by the time you read this, but I hope you came to buy or to sell or just to meet friends. Interstate visitors are always welcome though most of the attendees are from VK5.

There are always bargains to be found and treasures to exchange. The opportunity to see the latest transceivers and other goodies is not to be missed.

As long as the weather blessed the day it is certain that everybody had a good time. See you again next year.

October Meeting

This was another special meeting that gave us the chance to see some new equipment and to learn about the some digital mobile radios.

Steve VK5SFA, who showed us his loop antennas a few months ago, introduced this the Digital Mobile Radio (DMR) system of VHF/UHF worldwide communication. Yes, with a handheld transceiver you can talk to the world. These units are available from a number of different manufacturers and come in a number of different sizes and styles as the picture shows.

He was ably assisted by Brendan VK5FBFB who provided us with a couple of film clips in which the system was explained. We have seen something similar in D-STAR but this is the very latest idea which has only fairly recently become available to amateurs.

The system was initially a commercial development. It is used by thousands of professional land-mobile radio networks worldwide. However, as a few of those using it were also radio amateurs, they extended it to include operation on the UHF amateur bands.

One of the special features is the use of TDMA (time division multiple access), so that two separate signals can use the same 12.5 kHz 'slot', thus freeing more frequency space for other users.

Voice, text and data can all be used and some TRX also provide location information or have call alerts built in.

Repeaters have been developed alongside personal radios as currently there are up to a dozen repeaters already being used in Australia and thousands worldwide all of which can be accessed from a handheld. The frequency used in

Australia is 438/9 MHz in the UHF band. Each has its specific ID. Each handheld has to register and be provided with its particular ID.

There are a number of colours which probably are associated with different countries. Australia is colour code 1. There are also different time slots for different countries. There are associated with worldwide calling. Some examples are Time Slot 1(TG1) is worldwide calling but, if you use TG13, you are calling for Worldwide English speaking contacts.

Steve and Brendan then demonstrated by having a number of local and overseas contacts we could all hear. The audio was certainly clear and pleasant listening.

Christmas Dinner

The venue for the dinner is the Belair Hotel. The date is 18 December 2016 and the time is 12 noon. Do come along as it is a fun dinner and it is good to have a chance to wish our friends Season's greetings. The weather has been kind other years, we hope it is the same this year.

Annual Picnic in January

The date of this will be broadcast. The venue will probably be the same as we have used for several years. The lovely spreading gum trees provide plenty of shade for us all.

Christmas and New Year Greetings from the Committee

With the New Year and AGM early in the year, think about offering your services to the Society as a number of places on the committee will become vacant then. The viability of any club depends on people offering their services. The duties are not onerous but the rewards are worth your time.

(Digital Mobile Radio)



Handheld transceivers of many varieties.



The WIA AGM 2017 details



The Wireless Institute of Australia annual general meeting weekend is in historic Hahndorf South Australia from **Friday 19** to **Sunday 21 May**, with the event outlined on the WIA website.

Those attending the main event will head for the Adelaide Hills Convention Centre. The theme for this event and associated activities is *'Inspiring Leadership: the future of Amateur Radio'*.

The location is the tourist township of Hahndorf, only half an hour from Adelaide, within reach of the famed wine district of the Barossa Valley and near the Lofty Ranges.

Accommodation, transport, and the many tourist attractions are shown. The event starts on the Friday night with an optional restaurant gathering, the AGM on Saturday along with the open forum, and followed by technical presentations.

During this time there is a partner tour, and all will come together for the traditional gala WIA dinner on Saturday night.

The Adelaide radio clubs have been busy organising the weekend. The WIA has begun taking bookings. Now is the time to make plans to be part of the **WIA AGM 2017** on **19-21 May**.

Promote our hobby



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

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

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



Contests

Trent Sampson VK4TS
e vk4ts@wia.org.au

Contest priorities for December

Contest	Date (UTC)	Rules	Difficulty	Software	Modes
ARRL 160 m	2nd/4th Dec	www.arrl.org	Easy. But need DX antenna	N1MM/TR4W/	CW
ARRL 10 m Only	10th/11th Dec	www.arrl.org	Easy Fun	N1MM/VKCL	SSB
Stew Perry Top Band	17/18 Dec	http://www.kkn.net/stew/ 160 m Only	Easy. But need DX antenna	N1MM/TR4W/	CW

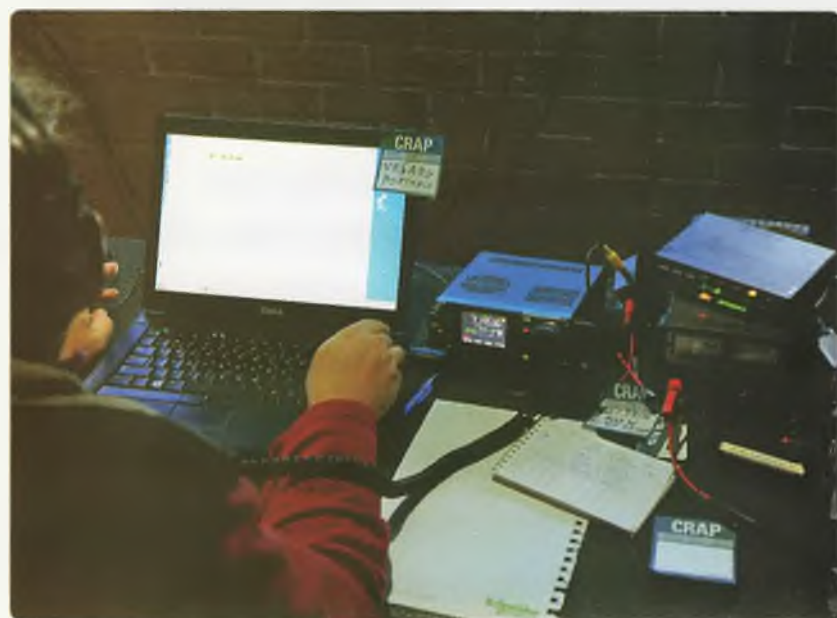


Photo 1: Simple stations do get results.

After finishing the CQ WW SBB this column is being typed - and what a tough gig it was with the bands making us work for contacts.

Ed N1UR in an email to the CQ Contest Reflector commented: "Low sunspots often mean great 40 - 160 conditions. This was low sunspots combined with highly absorptive storming conditions. By the time 1200Z rolled around on Saturday, people were throwing in the towel. Not because of low solar numbers, but because of the storm."

From VK4KW the ongoing improvements meant that even

at the bottom of conditions we still managed 700 + contacts on 10 metres and over 2100 on 15 metres - To me that is one of the reasons contesting is interesting. We continually improve VK4KW with bigger and better wires and bigger and better aluminium. If you have not improved your station over a sunspot maximum then you can look forward to a very tough bottom of the cycle.

Some ideas on entering the contests

ARRL 160 m

Owing to the short hours of this contest, it is all about fun. You do need an antenna capable of working into North America on CW.



Photo 2: Laptops and interfaces make digital fun.



Photo 3: No need for multiple beams in the digital world.

Some of these vary from a simple dipole to multiple verticals. One of the simplest is the Rippletch 160/80 m Sloper antenna: chat with Tony VK3TZ about what suits your station: <http://www.rippletech.com.au/html/tz-1820sl.html>

ARRL 10 m

This year this will be a hard slog. For those without gain antennas, the past few years have been fun in this contest but 2016 will sort the girls out from the boys (you will have to work out the gender slant). Even stations with multiple gain antennas may just be listening to band noise but those who tough it out will be in for a few surprises.

The VK record in this contest was from VK4KW with Phil VK4BAA and myself. Phil did the CW and I took turns on SSB. Tips are: don't leave the chair during potential

openings and look for skewed paths - the bands are not in good shape but December does turn on our best 10 m propagation.

Stew Perry Top Band

This event is another 160 m event. CW only, the biggest difference with the Stew is that it is a distance based contest, so VKs are at a big advantage with multiple points per QSO.

Contesters Tricks VKCL

VKCL by Mike VK3AVV has been a standard by which all Australian Contest loggers are judged. The programme in its native format does not support Voice or CW Keyers but there are several work arounds. VK3VT has produced an AHK file to run CW Type and the K9DUR Voice Keyer - A quick google will find that

or see: <http://nerg.asn.au/rdcontest/Setting%20up%20VKCL%20and%20Voicekeyer.pdf>

Also, the Software by SM3W also integrates well with VKCL Voice Keyer 1.7:

http://www.sm3wmv.com/homebrew/voice_keyer_download.php

Omni Rig is used to support the rig data interface.

IT IS NOT A GOOD GENERAL LOGGER

Networking support is excellent, including chat between operators in multi-op stations.

Contester of the month – VK5GR

Contester of the month for December is Grant Willis VK5GR.

While he has been around amateur radio for a while, a

resurgence in activity from VK5 HF community has Grant as one of its drivers; a keen digital modes player and a true team player - Some may know Grant from his proposals for frequency allocation proposals and his time on the WIA board - But here is Grant the operator:



Photo 4: Grant VK5GR in action during a contest.

What is your favourite Contest?

Singling out just one as a favourite is hard for me as there are two or three aspects of contesting I like. For the sheer fun of it, the Digifest contest (<http://mixw.net/misc/DigiFest/>) is probably my favourite digital modes contest; where you get to repeat work stations on each of five different modes on the five main contest bands (RTTY, PSK, MFSK16, Olivia and Hellschreiber). For SSB, it has to be the John Moyle Field Day.

What is your favourite Rig?

Well, I only have one, so I guess it is the Kenwood TS-690S. An old but reliable workhorse in my shack that is easy to drive and does what is says on the cover. Having used others during the VK5ARG contest activations, I do also have a soft spot for the Elecraft K3.

What modes do you contest in?

Both SSB and RTTY. I haven't managed any big scores in a RTTY contest yet but that is more due to home station capability at this point. I have entered more digital mode contests than SSB ones this past year.

What is your favourite contest band and why?

For RTTY it has to be 20 m into Europe. For SSB, 40 m for all round

domestic coverage throughout a large part of the day. I do have a soft spot for 80 m at night however, having had some of my biggest point gains on that band at night. It is not a band to be overlooked, especially as we head deeper into the sunspot minimum.

What is your preferred Contesting Software?

For the domestic SSB contests, I use VKCL by Mike VK3AVV. For the RTTY contests I am still experimenting. Integration between the RTTY terminal software and the logging platform is key. For RTTY currently I am using fldigi. I quite like the user interface fldigi presents, although its RTTY decode isn't fantastic. To overcome that I also run a copy of GRiTTY at the same time, which has more advanced decoding routines. For digital modes logging I use the native log function in fldigi, but do find it has a lot of problems, particularly at the end of the contest when it has to be translated into Cabrillo format. I am looking at MMTTY and its ultimate integration to N1MM as a final solution but haven't got it working yet.

What is your preferred Mic and Key?

At this stage I don't have a preferred one. I am still using the basic microphone that came with the Kenwood. I do like the Heil Pro-Set Plus that I have on loan and are very likely to get one of these for myself.

What is your "not so secret" weapon?

Location, Location, Location..... Get somewhere with a low noise floor so that you can pick out the weak stations and work them, especially on the low bands. Oh, and antennas with as high a radiation efficiency as you can get - make sure your signal can be heard - especially if you are only running 100 W and are going up against stations using amplifiers.

What is your best tip to a newbie contester?

If you are a low(ish) power station, I have found that you may not

always pick up the hunt and pounce operators who might for sake of ease skip over your weak signal and not give you call. My solution has been to mix calling CQ for 20 - 30 minutes with about 10 - 20 minutes of hunt-and-pounce style activity. This has worked pretty well for the RTTY contests for me too. Other big stations will usually try and answer weaker calls and at least you will ensure you get all of them into the log.

What are your aspirations in contesting?

To have fun and build skills running busy bands and pile-ups - good training for future IOTA activation plans.

What would you like to improve in your skills and/or station?

I think the first thing is to get a second rig and get into SO2R operation. I also need to build skills in operating as the target station calling CQ when running RTTY split frequency operation.

Who is VK5GR?

I was first licensed in 1986 at age 14 whilst in high school as VK5ZWI. The first few years saw me active on ATV and RTTY/Packet modes on VHF as well as participating in foxhunting (having competed in the Australian Fox-hunting championships in Mt Gambier for a number of years with various VK5 teams). I was also involved with running several clubs in Adelaide during the 1990s (SCARC and SAPUG) and held a position on the VK5 Division WIA Council in the late 1990s and early 2000s, eventually performing the Federal IARU liaison role. I then dropped out of amateur radio for about six years, returning about 2008 as VK5GR. Today I have rekindled my interests in Packet Radio, ATV, Contesting and been active with the Project Horus high altitude balloon group in Adelaide. Finally, after 30 years, I also discovered the magic of HF and am now working to establish a meaningful HF station at home. Digital modes on HF have

captured my imagination too and a lot of time has been spent this year chasing a DXCC on digital modes, all using 100 W and a dipole (96 countries worked so far and 75 confirmed). Into the future, portable HF operation is calling and exotic places around the planet await.

I have been contesting on and off for about 30 years, initially starting out with the South Coast Amateur Radio Club under VK5ARC or VK5TTY. Since 2010 I have been involved in some of the larger contesting operations that the Amateur Radio Experimenter's Group has staged in the John Moyle, IARU Championships and the Oceania DX Contest. 2016 was

the first year I have had a HF station setup at home, and so my contest participation has taken off. I am a big fan of digital modes so this year I have participated in about five digital mode contests. I haven't been competitive yet but none the less I am out there on the band. At the very least I get the pleasure of knowing that I am giving out multipliers to those overseas who are prepared to put in the effort to work my meagre signal and it is a great way to increase your DXCC country count as stations appear in contests from the most unlikely of places.

Contest Terms

Run: Call CQ and stay on the same frequency.

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

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

Multi: Short for Multiple operator or transmitter.

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

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

Help us



Contribute to the Weekly WIA News Broadcast.

See our website for details.

www.wia.org.au/members/broadcast/contribute/



AMSAT-VK

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

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

Website:
www.amsat-vk.org

Group site:
group.amsat-vk.org

About AMSAT-VK

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

AMSAT-VK monthly net

Australian National Satellite net

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

In New South Wales
VK2RBM Blue Mountains repeater on 147.050 MHz

In Queensland
VK4RIL Laidley repeater on 147.700 MHz
VK4RRG Redcliffe 146.925 MHz IRLP node 6404, EchoLink node 44666

In South Australia
VK5TRM, Loxton on 147.175 MHz
VK5PSC, Mt Terrible on 439.825 MHz IRLP node 6278, EchoLink node 399996

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

In the Northern Territory
VK8MA Katherine 146.700 MHz FM

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

Become involved

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

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

Ross Hull Memorial VHF-UHF Contest 2017

John Martin VK3KM

The next Ross Hull Contest will run through the month of January. Logs will be due by 13 February.

If you participate in the Summer VHF-UHF Field Day, remember that you can count Field Day contacts (one per station per band per day) in your Ross Hull Contest log. There is no need to exchange separate serial numbers for the two contests.

The possible rule changes that were flagged some months ago did not receive a positive response, so the 2017 rules will be unchanged from those of 2016.

For me this is contest no. 26, so it seems like a good time to take a break.

The Contest

The WIA maintains a perpetual trophy in honour of the late Ross A. Hull and his pioneering achievements in VHF and UHF operation. The contest is open to all amateurs. Certificates are awarded to all entrants, including certificates for the top scoring amateurs in each licence class.

Duration

0000 UTC January 1 to 2400 UTC 31 January.

In Eastern Summer Time, that is 11 a.m. on January 1 to 11 a.m. on 1 February.

Sections

- A: Best 7 days, analog modes.
- B: Best 7 days, digital modes.
- C: Best 2 days, analog modes.
- D: Best 2 days, digital modes.

Digital modes are defined as those in which the decoding of the received signal is done by a computer.

Entrants may submit logs for more than one section.

General Rules

One callsign and one operator per station. Stations may operate from any location. You may claim one contact per station per band per UTC day. Repeater, satellite, EME and cross band contacts are not permitted. Split frequency operation is allowed, for example on 50/52 MHz. Calling frequencies should be kept as clear as possible so as not to interfere with other stations making or listening for calls. If contact is established on a recognised DX calling frequency (i.e. 50.110, 144.100 etc), stations should QSY up to .150 or higher to make the contest exchange. All rulings of the contest manager will be accepted as final.

Contest Exchange

For Section A or C, Entrants must exchange RS (or RST) reports plus a serial number. Serial numbers need not be consecutive. *NOTE: For propagation modes such as meteor scatter or short-lived sporadic E openings, it is sufficient to exchange callsigns plus two further digits that cannot be predicted by the other station.*

For Section B or D, exchange callsigns plus two further digits that cannot be predicted by the other station.

While not an essential part of the contest exchange, Maidenhead locators may also be exchanged as an aid to distance calculations.

Logs

Logs must contain the following for each contact:

- Date and UTC time.
- Frequency and callsign of station worked.
- Reports and serial numbers sent and received.
- Approximate location or grid locator of station worked.

Separate scoring columns for each band would be helpful.

Scoring

Scoring will be based on the best 7 UTC days nominated by the entrant.

For each contact, score 1 point per 100 km or part thereof (i.e. up to 99 km: 1 point, 100 – 199 km: 2 points, etc.)

Multiply the total by the band multiplier as follows:

6 m	2 m	70 cm	23 cm	Higher bands
x 2	x 3	x 5	x 8	x 10

Then total the scores for all bands.

Cover Sheet

Logs must be supplied with a cover sheet containing:

- Operator's callsign, name and address.
- Station location (if different from the postal address).
- Section(s) entered.
- A scoring table set out as the example below.
- A signed declaration that the station has been operated in accordance with the rules and spirit of the contest, and that the contest manager's ruling will be accepted as final.

Please use the following format for your scoring table. If you wish you can cross-check by adding the daily totals across the table, but please make sure that you include the separate band totals.

See table over next page.

A cover sheet and scoring table is included in the postings on the WIA web site. Copies can also be obtained from the e-mail address given below.

Penalties

Minor errors may be corrected and the score adjusted. Repeated use of recognised DX calling

Date	6 m		2 m		70 cm		23 cm		etc	
Day 1	xxx		xxx		xxx		xxx		xxx	
Day 2	xxx		xxx		xxx		xxx		xxx	
2 Day Subtotals	xxx	+	xxx	+	xxx	+	xxx	+	xxx	= xxxx (2 DAY SUBTOTAL)
Day 3	xxx		xxx		xxx		xxx		xxx	
Day 4	xxx		xxx		xxx		xxx		xxx	
etc.										
7 Day Totals	xxx	+	xxx	+	xxx	+	xxx	+	xxx	= xxxxx (7 DAY TOTAL)

frequencies (especially when the reports indicate strong signals) may lead to disqualification. Inclusion of any false log entries will lead to disqualification.

Entries

Paper logs may be posted to the Manager, Ross Hull Contest, PO Box 2042, Bayswater Vic 3153. Electronic logs can be e-mailed to rosshull@wia.org.au. Acceptable log formats include: ASCII text, RTF, DOC, DOCX, XLS, MDB, PDF, or any Open Document format.

Logs must be received by **13 February, 2015**. Early logs would be appreciated.

Note on Calculating Distances

Absolute accuracy is not required. You just need to know whether each station is above or below the nearest multiple of 100 km, so you can use a compass to draw 100 km circles around your location on a map. Alternatively, you can use contest logging software that can calculate distances. If so,

you will need to exchange 6-digit Maidenhead locators to get an accurate distance measurement. You can also calculate distances from six-digit Maidenhead locators using a computer program that is available on the Ross Hull Contest page of the WIA web site.

Contest web page: <http://www.wia.org.au/members/contests/rosshull/>

Pre-sales of history book begin

The WIA Bookshop is now taking orders for the *'Wireless Men and Women at War'* publication that details the history of wireless communications before World War I, and in later years and conflicts.

The price is **\$29.95** plus postage for members and **\$35** for non-members, plus postage of \$9.

The pre-sale period is now available, with a discount applying to orders received by December 21.

WIA Historian *Peter Wolfenden VK3RV* has fully researched the content. Together with numerous additional contributors, the WIA Board fully supports this timely record of history as a must read volume.



The WIA Publications Committee is proud to make it available and after printing the book will be a mail order item from the WIA Bookshop.

http://www.wia.org.au/members/bookshop/page_data.php?id=258

36th ALARA Contest Results and Report

Diane Main VK4DI

VK7QP	Linda Luther	5,770 Points: Phone	Top Overall, Top VK7 Member
VK3VIP	Jean Fisher	4,296 Points: Phone & EchoLink	Top VK3 Member
VK5YL	Shirley Tregellas	2,775 Points: Phone & EchoLink	Top VK5 Member
VK4SWE	Lyn Battle	2,480 Points: Phone, CW & EchoLink	Top VK4 Member
VK6DE	Bev Hebiton	1,197 Points: EchoLink	Top VK6 Member, Top EchoLink
VK2FENG	Helen Kilborn	1,152 Points Phone & EchoLink	Top VK2 Member, Top Foundation
VK4DI	Diane Main	8,112 Points: Phone	Check log
ZL2 UJT	Ngairie Jury	763 Points: Phone	Top ZL Member
VK2IUW	Hilary Bridel	5,111 Points: Phone, CW & EchoLink	Top OM Overall, Top VK2 OM
VK4CC	Col Clarke	320 Points: Phone & CW	Top VK4OM
VK7IF	Ian Fletcher	275 Points: Phone	Top VK6 OM
VK3AJV	Mike Subocz	275 Points: Phone	Top VK3 OM
VK5HEL	Geoff Osborne	120 Points: Phone	Top VK5 OM
VK6DW/P	Ian Cook	100 Points: Phone	Top VK6 OM
VK2FAIB	Gordon Gam	100 Points: Phone	Top Foundation OM
ZL3VZ	Bill Cousins	510 Points: Phone	Top ZL OM

25 Logs submitted:

14 x VK ALARA members

1 x ZL Member

No YL Non-Members

9 x VK OM Logs

1 x ZL OM Log

This year's ALARA Contest saw some changes to the rules with a return to a straight 24 hour contest and the introduction of multipliers to give the contest a bit more interest.

I did notice that a number of YL participants didn't realise that the exchange format had changed. The rules were up on the website from late May and printed in *AR* magazine prior to the date of the contest.

I also had a number of announcements on the WIA news. The rules for next year won't change significantly. The

majority of contacts were on phone with only three members using EchoLink exclusively and no 2 m contacts at all. The inclusion of EchoLink has resulted in a number of negative comments directed at the contest format, but as we have a few members who can only use EchoLink it will remain in the short term.

Mike VK3AVV kindly updated his VKCL Contest Logging program to incorporate the new rules. The ALARA contest has been included in this VK specific contest log for over 10 years. Mike is very generous in providing the program free.

A total of 25 logs were received which is five more than last year.

Conditions weren't that great for DX but there was a reasonable amount of VK /ZL activity.

Once again there weren't a lot of YLs on air and I wonder if this is because they think contests are difficult and maybe just need to gain confidence to get on and have a go.

Perhaps asking a local club to assist with learning computer logging or getting involved with a field day will give the YL's some extra skills to make this contest great again.

The ALARA Contest isn't one where you need to operate at breakneck speed, but is one where newer operators can get involved comfortably.

Certificates and Plaques should have been received by the winners before this report is published.

Diane Main VK4DI
ALARA Contest Manager.

Wanted

Articles and high quality photographs for
Amateur Radio and Callbook.

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





ALARA

Christine Taylor VK5CTY

You don't have to only use a Monday night to make a contact

As well as our normal Monday night ALARA 80 metre net, if you have HF there is a YL net on a Monday afternoon at 0500UTC on 14.222 MHz. This net has been running for many years and is currently 'warming up' as the sunspot cycle rises. It is a good space and time to find overseas YL and OM contacts. The OMs are as keen to make YL contacts as we are to make contact with them.

Also on a Monday the ANZA net is popular on 14.183 MHz at 0515UTC. This can usually be found as the 222 Net finishes. Currently Lyn VK4SWE is Net control for the Monday session for the ANZA net. You will find a few YLs on this net, Shirley VK5YL and Leslie VK5L0L, with June VK4SJ and Elizabeth VE7YL.

After the ANZA net on a Monday, Lyn VK4SWE runs a ROTA net (Recipes on the Air) session. It's a way of getting YLs on to the radio and is proving lots of fun with the OMs as well. Please join us whenever you are home on a Monday afternoon, usually around 0615 UTC.

If you don't have HF, try the ALARA Conference station on the fourth Thursday of the month (0500UTC) for the YL Downunder net. Shirley VK5YL is net control for this group. Shirley, VK5YL, has lots of information about all these nets as well as being a regular on most of them.

The ALARA-Conference station on EchoLink was started a few years ago when some of the VK4 YLs wanted to make contact with DX ladies but only had access to 2 meter hand-held radios. Shirley



Photo 1: A rescued wallaby.

was asked to be net control initially and our station has now grown and has passed from the OM, who set it up all those years ago, to ALARA Inc with Shirley as Conference Controller. We have regular nets held on this Conference station with DX contacts, especially on a Friday morning from the US YL groups.

The ALARA Contest

We were rather disappointed that there were not more YLs on the air during the Contest. It is our Contest and it is us that other amateurs want to hear so please ladies, see if we can put aside a little time to publicise our hobby to the outside world. If you are not yet comfortable on HF, use the Remembrance Day contest the previous weekend as a practice run. The ALARA Contest is not a serious one, but it gives us a chance to talk to people we do not often hear.

(ALARA Contest Results are in this issue)

An on-going JOTA station in VK4

It's been a busy month for ALARA Member Diane VK4DI and husband Bill VK4ZD. October 15th and 16th saw Diane and Bill participate in their 35th JOTA weekend since 1978. Their daughter Alizah VK4FOX and Darling Downs Club member Paul VK4CPS also assisted over the weekend.

The property was tent city for 24 hours! A total of 30 guides and leaders from Gatton, Helidon & Goondiwindi descended on their Lockyer Valley ham shack for a weekend without phones or internet. A surprise visit from the owner of the neighbouring property with some rescued wallaby Joeys added some excitement.

This is the fourth year the Goondiwindi Guides have made the trip. The leaders had drilled the girls with the phonetic alphabet and they were given a short training on talking into the microphone. A number of the guides have attended

before and were able to encourage their friends. One of the leaders said she has been in Guides for 20 years and wishes she'd attended JOTA before now. Everyone wants to return in 2017. The guides thoroughly enjoyed getting on air and talking to other groups, in fact some of them needed a lot of encouragement to allow someone else to sit in the operator's chair. Diane presented some of the girls who excelled "On Air" with Certificates to recognise their efforts.



Photos 2: At the mike for JOTA.



Photo 3: A guide with her Certificate.

Diane is also involved with the VI50CC special event station to celebrate the 50 Year Anniversary of the Cooby Creek Tracking Station north of Toowoomba. The Darling Downs Radio Club set up a field day station on site for the reunion weekend on Oct 23rd & 24th with information on Ham Radio. Diane was interviewed by Win TV with Bill



Photo 4: At Cooby Creek.

being filmed making a contact into Pitcairn Island as well.

Some of our travellers return

Shirley VK5YL, our President and her OM Jim have returned from their Asian cruise, though unfortunately, they caught some nasty bugs so they are still recovering. But they experienced a totally different culture and living conditions to what we are familiar with in the Western world. Some great memories of elephant rides, pewter bashing and Butterfly Park will stay with them.



Photo 5: Front: Mum Elsie, Robyn VK3WX & Cristina VK3FCRS. Back: Susan VK3FZZY, Kaye VK3FKDW, Jean VK3VIP, Carla VK3-A, Donna VK3FRET, Noreen & Margaret VK3FMAB.

A great Thai recipe has been by shared Shirley on the ROTA net.

Tina VK5TMC, our Treasurer and her OM Robert have returned from the USA where they enjoyed catching up with Tina's family and toured most of the incredible National parks which I visited a

couple of years ago. They also took advantage of the 'end of season' sales to replenish their wardrobes with clothes several sizes smaller than before, to fit their newly svelte shapes.

Both YLs will have tales to tell on the Monday

night nets. Remember these are on EchoLink on the first and third Mondays, and on 80 metres on the second, third, fourth and fifth (when there is one) Mondays. All nets start at 1000UTC in the Summer time.

VK3 News

On Friday 28th October, ALARA YLs and OMs gathered for dinner at the Glen Waverly RSL to meet Donna's Mum. Noreen has been over from Adelaide for a short holiday and it was lovely to spend some time with her.

The next VK3 lunch is in November in Sunbury with Xmas celebrations. Details will be emailed.

Lunches for 2017 have been booked and the list will be out soon.

Merry Xmas and Happy New Year to all from ALARA in VK3.

The International meet in the UK

This was attended by a small number of VK YLs. We await their return and look forward to their reports soon.

Christmas and New Year Greetings from all on the Committee.



VHF/UHF - An Expanding World

David K Minchin VK5KK

Introduction

Season's greetings to all! This month we have an updated report on Tropospheric openings across parts of Australia as well as a report on EME activity. In the technical corner we have part four of the microwave local oscillator series as well as Kevin VK4UH's Meteor Scatter report.

2016/2017 Tropo Season

At last there has been some sign of life over our long distance paths! For regular watchers of the Hepburn Tropospheric chart, there has been a lot of black across the bottom of VK and ZL with some "colour" up the eastern coast of VK but not quite extending to ZL. Now that it has finally (nearly!) stopped raining across VK2, 3, 5 & 6, there has been some evidence of the season opening.

As previously reported in this column, Rob VK6LD operates a remote station at Albany with 144 MHz & 432 MHz capability (VK6LD/P). On 5/11/16 Rob reported hearing the Adelaide beacon VK5VF on both 144.450 & 432.450 MHz (519) from 0121Z till the last report at 1943Z. Rob also heard the newly updated VK5RSE beacon on both CW and JT4 modes on 144.550 MHz (519) at a distance of 2037 km @ 0641Z (Mid-afternoon). Early next morning, Ron VK6VOX @ Katanning, WA also copied VK5VF on 432.450 MHz at 1705Z.

Hepburn at the time showed a very consistent pattern of good colour a number of days out for the Australian Bight path. It was also correct in predicting that the

opening would be short lived (1 day!). No reports of actual contacts occurring or any WSPR activity.

The opening could be the "marker" for the ~4 week Tropo cycle across the Bight; we should know by the time you read this! For interest, the Australian Bureau of Meteorology (BOM) reported in its ENSO (El Niño Southern Oscillation) wrap-up for 2016 reports the following:

"The tropical Pacific Ocean remains El Niño Southern Oscillation (ENSO) neutral. Negative Indian Ocean Dipole (IOD) conditions continue, but are likely to ease by the end of spring.

Trade winds in the tropical Pacific have returned to near-average after a surge in early October. Correspondingly, sea surface temperatures (SSTs) in the central tropical Pacific Ocean cooled but then rebounded and remain within the ENSO neutral range. In the atmosphere, the Southern Oscillation Index (SOI) has returned to near-zero values. However, cloudiness near the Date Line continues to reflect a La Niña-like pattern.

Most climate models predict SSTs will remain cooler than average, but ENSO-neutral, through until the end of the 2016/17 summer. Only two of eight models suggest brief, weak La Niña levels may occur towards the end of 2016. The ENSO Outlook remains at La Niña WATCH.

Warmer than average sea surface temperatures to Australia's north suggest that some La Niña-like impacts are likely, even if an event never fully develops.

The negative IOD event, in place since late May, persists. Warming of SSTs east of tropical Africa has seen IOD index values weaken over the past month, but SSTs remain very much warmer than average south of Indonesia. Models indicate the IOD will return to neutral by the end of spring. Both a negative IOD and La Niña typically contribute to increased rainfall in spring for eastern and central Australia."

Perhaps supporting the BOM's La Nina observation in the Pacific, VK4 has had a series of Tropospheric openings on 144 MHz with 57 – 59 signals over distances of up to 1400 km. Openings occurred around 21/10/16 and 31/10/2016 indicating a good build up for the ZL season. Overland Tropo paths continued to perform in October as per previous months between VK2, 3, 4 & 5 with Leigh VK2KRR reporting good conditions to VK5 (800 km) on 8/10/2016 on 144 & 432 MHz despite being on the back end of a rain cell.

VK4EME 432 MHz EME Report

Allan Downie VK4EME (QG63kq) has been active on 432 MHz EME for many years. Allan's impressive 16 x 15 element (240 elements!) array has been in service for 10 or so years and recently needed some maintenance. It didn't quite go as planned:

"I was lowering my EME array, (16 x 15 DL6WU Yagis). It sits upon a tilt-over Nally tower. The antennas were most of the way down when the hook on the winch wire, which apparently did not lock in properly,

slipped off and the array fell about two meters onto the ground. Its fall was arrested only by the elevation linear actuator which now had a 30 degree bend in its arm and thus became forever useless. At the same time I had taken one giant leap for mankind in the opposite direction. I think I may have said something like: "golly gosh", more or less".

"The damage to the array was not extensive, but there were a few slightly bent Yagis, a bent cross-arm and the requirement for a new linear actuator. The cross-arm had to be taken to the local engineering company for straightening, which meant all the Yagis had to come off. Thanks to the invaluable assistance of Zane VK4ZB, we repaired several Yagis, made joins on the open-wire phasing harness and resealed 1:1 balun and coaxial connectors and so eventually we were able to put Humpty Dumpty back together again. Sun noise tests showed that all was working normally."

"By late September in less than optimum EME conditions, I managed to work BH4PVP at -23 dB. He runs 4x23 and 100 Watts. This gave me some confidence that the array was working fairly well. In mid-October I worked SM7GVF, UT6UG, DL6SH, DF3RU, OK1DFC, OH3LWP, PA5Y, Dj4TC, EA5CJ, F6APE, PA3CSG, PA2V, DL8FBD, G4RGK, DD0NM, PA2CHR and US7GY. The second leg of the annual ARRL EME contest was held over the weekend 22/23 October 2016. The following stations were worked; KN0WS, KA1GT, K2UYH, JE1TNL, K4EME, K3MF, K7MAC (100 w to a single 32 element yagi!!!), K5DOG, OH2PO, DL7APV, SM7SJR, YL2GD, HB9Q, UT5DL, OH2DG, EB2FJN, DL6SH, UA3PTW, PI9CAM, W7MEM, and W5LUA."

I am looking forward to the last leg of the contest in November. If anyone reading this thinks they would like to have a go on 70 cm EME I would be keen to arrange



Photo 1: VK4EME's 432 MHz 240 element EME Array.

a sked (or try to answer any questions). A minimum of one or two decent Yagis (2x24 or 1x32+) and 100 watts AND a good low noise preamp, preferably masthead mounted is needed. Elevation is

not necessary as the last/first 10 degrees of moon will be sufficient. By way of example, I have worked many, 4x11 or 4x13, 2x19 or 2x25, (KJ7OG 2x12 500 w and EA5CLH 2x11 and 50 W are examples) and



Photo 2: VK4EME's damaged elevation actuator.

the odd one yagi station such as K7ULS 9 w/1 and 70 W and K7MAC 32 el and 100 Watts. All it takes is a bit of perseverance sometimes. My email address is vk4eme@westnet.com.au."

Throughout 2016 I've had a few suggestions to include a section on EME every month. Historically VK has been an early adopter of EME from the days of Ray VK3ATN's exploits in the mid 1960's and a series of world records set over the years. A growing number of VK stations have been active on 144 MHz to 24 GHz EME in the past 10 – 15 years. And Digital modes now mean EME contacts can be achieved with more modest equipment.

From the Jan/Feb 2017 issue we will have a regular section on EME. Contributions can be anything, even just a short email to let me know what band(s) you are QRV on EME will be welcome! Even if you are not active on EME hopefully you will be inspired to give it a go! The deadline for contributions is a few weeks after you read this (20/12/2016), just email me as per the address at the top of the column.

The Microwave Local Oscillator Part 4

This month we will talk about combining old and new technologies to produce a "clean" PLL based microwave local

oscillator. But first some more feedback on those Chinese sourced ADF4350/51 PLLs!

As more people have experimented with the PLLs available on eBay a few more details have emerged. The question most asked is: which ones are good and which ones to avoid. The only guide so far is the second oldest rule in the book; you get what you pay for! There would seem to be two groups. Those that are about double the price of the cheapest ones do look like a serious design attempt and probably use genuine first grade ADF chips. They would seem to perform closest to specification. The other group (cheapies) has variable quality and mostly seems to have ADF chip seconds, miss-labeled chips or maybe even counterfeit chips! A slight variation in the way the chip is printed is a clue to the latter. Hams being hams most have bought the cheap ones, hence the largely poor results!

Andy G4JNT has recommended swapping a genuine ADF4351 into one of the cheaper boards to improve performance. This is not an easy job however, as ADF4350/51 use a LFCSP 32 pin chip with its ground-plane soldered to a large earth pad. Genuine ADF chips are available from the usual on-line electronics merchants like Element 14, RS Components, Digi key etc but they are not cheap (~A\$28).

This confirms why there is such a difference in price for these PLL boards on eBay. You will find ADF chips cheaper on eBay but then you could just be buying another questionable ADF chip! In the end, it's probably easier to buy a better quality PLL board to start with and maybe skip the cheaper ones for serious work.

Now to our main subject for the month:

In various parts of this series, we have discussed the resonator used in the PLL VCO being a pivotal part of overall performance. Using a quartz crystal as the resonant element of a VCO is still at the top of the performance list for phase noise and spuri.

"Pre-PLL", a quartz crystal local oscillator chain was the most popular way to generate a local oscillator signal. Unfortunately, as you go higher in frequency the complexity (number of stages required) gets higher to the point where the local oscillator is the most complex part of the transverter. The extreme is on 76/122 GHz where the transverter could be an 8 stage multiplier chain followed by a single diode mixer! That all said, a number of traditional transverters available still do use a crystal oscillator multiplier chain, i.e. the DB6NT range of transverters including the 10 GHz Mk2 transverter kit (www.kuhne-electronic.de), etc. Others use a mixture of onboard multiplication requiring a ~1 GHz local oscillator (Down East Microwave, VK3XDK or Minikits) so you can either use a PLL or a separate crystal oscillator chain. Local oscillator kits (500 MHz – 12 GHz), heaters and crystals are all still available for most popular frequencies from Minikits, Kuhne Electronics, etc.

There are two ways to go about locking a crystal; an external controller to lock the existing oscillator or an external PLL locked oscillator.

From the mid 1990s a few schemes appeared to lock crystals

to a stable reference. Dave Clawson WA6CGR published a discrete design in the 1994 Microwave Update to lock the then popular Frequency West harmonic microwave sources. In 1996 David VK5KK adapted Dave's design and produced the "KK048" kit to be used with the then popular G4DDK, KK7B and G3WDG crystal based local oscillators. Through the VK5 Equipment Supplies over 100 of these were sold in VK and overseas, the last request for boards was only a few months ago! (Sorry no longer available but still have the Protel files).

In the early 2000s Louis Cupido CT1DMK produced the much simpler "Reflock" and "Reflock 2" PLL reference using a CPLD programmable array chip. If you are lucky you will still find parts to make a Reflock. Both the Reflock and the KK048 were designed as an "add on" to an existing local oscillator work with a 10 MHz reference but can be adapted to work with any reference up to 25 MHz. More recently, David VK3HZ and



Photo 4: VK5KK's 10 GHz EME Transverter, OE2JOM PLL Source.

Graham VK3XDK designed the X-ref PLL for locking the reference oscillator of various commercial rigs. Quite conceivably a design along those lines using a modern PLL could be used to lock a ~100 MHz oscillator.

More recently the use of a completely separate PLL locked crystal oscillator has become more popular. This enables a better quality and thermally insulated

oscillator to be constructed. A quick Google will find a number of designs, most use the same PLL chips we have previously discussed. The most popular is the one designed by OE2JOM using an ADF4252 PLL, published in Dubus 4/12 and Technik 12. These are popular in DL/OE and used almost exclusively above 47 GHz, in some cases to provide the ~100 MHz

Photo 3: Component side of the OE2JOM PLL Source.



reference for DRO based oscillators. Hans produces kits (minus crystal) for both 1 mW and 10 mW versions. If you need more information please email me. I've built several of Hans OE2JOM's external oscillators, the photo shows one installed in my 10 GHz EME transverter.

To use an external oscillator with an existing crystal oscillator chain it is a simple matter of removing the crystal and coupling the external oscillator via a .001 uF capacitor to the FET gate.

PLL locking a crystal still needs consideration of the same factors of bypassing supply rails, solid construction, etc, as with any PLL system. The biggest drawback of using a crystal is that it will only operate over a 2-5 kHz range at the fundamental frequency so you need to be able to source one on the right frequency! As the tuning lock range is fairly limited, the thermal characteristics of the crystal are important. This means using a quality crystal designed for 40 – 60 degree operation and a good crystal heater. In some cases you can "rubberize" the crystal to cover a wider range but experience tells us that locking issues can occur with temperature excursions.

Next month I had planned to slot in an "out of the box" review of the Lime-SDR board. However, delivery has now slipped to mid-December 2016. With the postal system being clogged over Christmas delivery, it probably won't happen till New Year now, so instead we will have the final part in the PLL series.

In closing

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

73's

David VK5KK

Meteor Scatter Report

Dr Kevin Johnston VK4UH

Season's greetings to all the "rock-ops" and may your pings be loud, long and often!

Writing this column at the end of October, there are just the first signs of a general improvement in Meteor-Scatter conditions as Summer approaches and the tilt of the planet towards the sun enhances meteor reflections for us here in the southern hemisphere. The Orionids Meteor Shower came two weeks ago, peaking around 22 October 2016, and again clashed with a professional commitment, which also occurs on that same weekend every year, keeping me away from home and off the air. Hopefully I will be able to publish some reports in the next edition. Remember that the Leonid and Geminid showers are also coming over the next two months; details are at the end of the column.

As mentioned last month, a series of activity sessions have been running on Sunday mornings on 144.330 MHz in parallel to the normal activity periods for everyone to have the opportunity to try out some of the newer digital MS operating modes. Trial sessions dedicated to JTMS, JTMSK and MSK144 have occurred with variable success and more are planned for the Holiday season and New Year. It does appear at this time that MSK144 mode is where a lot of "development energy" is being spent by the development teams. The new Forward Error Correcting digital mode, which uses time-division-multiple-access (TDMA), is showing promise for MS operating even under very poor conditions. The only serious downside is that with MSK144 we will be forced to move away from our current VK/ZL practice of working several stations simultaneously and accept a one-at-a-time approach. I will bring forward more information on

development as it comes to hand.

Functional versions of the software are appearing on the web, including on Peter VK5PJ's site, where downloadable versions of WSJT-X can be found.

WSJT-X ver.1.7.0 RCI has a fully functioning version of MSK144 available. Also on Peter's site is an older but rather unstable version containing JTMSK mode.

vk5pj.com/wsjsx see ver. 1.7.0 r.7136 RCI

Up to date notices about planned practice sessions will be posted here, time permitting, on the Meteor Scatter e-mail-out and also on the VK-ZL VHF UHF Microwave Facebook page and the new OzLogger notice board. I hope everyone has registered for all of these new facilities already?

The next major Meteor Showers on the calendar will be:

Leonids shower peaking 17 November 2016 (ZHR 20/hour)

Geminids Shower peaking 14 December 2016 (ZHR 120/hour)

Any contributions or MS activity reports for this column are always welcome.

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The festive season is looming as we all enjoy the warmer weather and some hot spells during summer. The Council of Amateur Radio Victoria wishes all the complements of the season and a Happy New Year 2017.

The office at 40g Victory Boulevard, Ashburton, will close at 1 pm on Tuesday 20 December 2016 and re-open at 10 am on Tuesday 7 February 2017 next year.

ARV offers a sincere thank you to the volunteers who do the administrative functions and interface with members and the public. After many years of dedicated service, John Brown VK3FR has retired with our best wishes from the Office Management role and replaced by Rob Whitmore VK3MQ.

Thanks also to the Internet Project Development Officer, Gary Furr VK3FX for streamlining the online presence including the website, bookshop, awards applications and member subscriptions.

While the office is closed, urgent matters will still be handled. The end of our year is December 31 2016, with financial statements, stocktaking and an audit to be done.

The Annual General Meeting will be at 8 pm on Tuesday, 11 May 2017, at 40g Victory Boulevard Ashburton. Notice of special resolution must reach the Secretary by 2 pm on 14 February 2017.

Victorian LGA 2017 Challenge

This unique 'once off' special operating award from Amateur Radio Victoria is to encourage on air activity based on communicating with and between the 79 Local Government Areas (LGA) in the State of Victoria.

The Victorian Local Government Award Challenge is during the 2017 calendar year. It will be open to all, either "Activators" or "Hunters", and participation is encouraged in both categories.

The major awards are:

- Most VK3 Local Government Areas activated in 2017
- Most VK3 Local Government Areas worked in 2017

The winner in either category will receive, at no cost, a professionally designed, engraved and presented Wall Plaque, for display with pride in their radio shack.

Minor awards are eligible logs for Activator or Hunter categories

and will receive a professionally printed and sequentially numbered (gained from dates and UTC times) Award Certificate, at no cost. The Rules and Requirements are on the website under Awards. It sounds like a lot of fun. Are you up to the challenge?

Training and assessments

Thank you to those who have recommended the quality Foundation licence classes and assessments to others or have used them to upgrade their qualification through assessment.

The next session is on 10-11 December 2016 at the at the Amateur Radio Victoria office 40G Victory Boulevard, Ashburton.

The Foundation licence study and operational practice guide book, essential reading for those wanting to become a radio amateur, or as a shack reference, is available as a mail order for \$35 from the online bookshop via the website.

Please be quick to enrol or make further inquiries by contacting Barry Robinson VK3PV foundation@amateurradio.com.au or 0428 516 001.

Participate

Summer VHF/UHF Field Day	14-15 January 2017
Ross Hull Memorial VHF/UHF Contest	January 2017
John Moyle Field Day	18-19 March 2017



VK2news

Tim Mills VK2ZTM
e vk2ztm@wia.org.au

Well, it is summer and another year almost exhausted. This is the time when some clubs take an extended break from meetings and general activities. Everybody should plan to remain active with the various nets and other on air activities - lest some members drift off into other pursuits.

In recent times, **Westlakes** held their rescheduled car-boot sale which was washed out in September 2016. They also had the misfortune earlier in the year to have one of their repeaters put out of action by lightning. **HADARC** are towards the end of their 40th anniversary celebrations. One activity was to have members download a small flyer about the club for a letter box drop. The **Mid South Coast ARC** is another club who celebrated their 40th anniversary in November advises Secretary David VK2LDW. **ARNSW** held a Talk Fest early November 2016, along with a Foundation course weekend and a Trash & Treasure. The 2016 ARNSW Upgrade course ended mid-month. The driveway crossing from Quarry Road into VK2WI has been upgraded.

There is still much happening this month. The **Oxley Region ARC** has their annual Christmas party on Saturday 3 December 2016. They continue working on establishing the region's 6 metre repeater. **WICEN NSW** will have a training day on Sunday 4 December 2016 at the VK2WI site. There are exams for obtaining an **American Amateur licence** in Oberon NSW on Saturday 10 December 2016; seek details from Julian VK2YJS or check the Exam locations on the ARRL

web site. VK2WI News continues over the holiday period with morning only sessions on Christmas Day, New Year's Day and 8 January 2017. The evening sessions resume on 15 January 2017.

Manly Warringah RS recently commissioned their Software Defined Radio project. It covers 200 kHz portions of five HF bands, being 160, 80, 40, 20 and 15 metres. Go to their web site www.mwrs.org.au and click on the - WebSDR - link in the top menu. This project was in part funded by a Development Grant from ARNSW.

ARNSW is sending out the 2017 fridge calendar with all the general activities listed. In January 2017, the major event is the Trash & Treasure on Sunday 29. In February 2017 there is another in the Talk Fest series on 12 with the Central Coast field day on Sunday 26 February 2017. In March, the evening upgrade course commences on Monday 6. The first of the Foundation weekends will be on 18 and 19 and a Trash & Treasure on the 26. The ARNSW AGM is scheduled for Saturday 29 April 2017.

As many readers will know, ARNSW operates an equipment disposal service as part of the Trash & Treasure operation with major items on offer listed on the web site www.arnsw.org.au It should be noted that the only way to make an offer on items listed or any other request is by an email to disposals@arnsw.org.au The incoming email is time stamped as well as being a recorded message. Nothing is achieved by telephoning the unmanned ARNSW office as the answering machine is only checked

every couple of days.

The **Illawarra ARS** are currently trialling a Yaesu Fusion C4FM repeater at the VK2RMP Maddens Plains site on 438.725 MHz. In FM mode it is in the usual 5 MHz negative offset with a 123 Hz CTCSS access tone required. The repeater is operating in the Auto Mode, so analogue FM transmissions are retransmitted in FM, while digital C4FM are retransmitted in C4FM. They would like reports on this UHF repeater on 8725. Illawarra ARS provide retransmission of VK2WI News through their repeater network on 6 & 2 metres. They also provide EchoLink coverage through VK2MT-R and VK2BGL-R.

Since the days of crystal locked car phones, the 6 metre news coverage from VK2WI has been on the FM simplex channel of 52.525. This will change in the future to the 53.850 MHz VK2RWI repeater when an interface module is completed.

There is no need to tell you that HF propagation is poor at present and noticeable on the various HF broadcasts. While VK2WI has a range of frequencies in operation plus the 5 MHz VKE580 signal on 5425 kHz USB and linking to several repeaters beyond Sydney, it is still a struggle. At VK2WI some recent equipment upgrades have enabled a trial of live streaming of VK2WI News bulletins. The web stream is live during both Morning and Evening news bulletins as well as special broadcasts. There is some delay in the encoding and transmission over the internet, but the system uses a service 'in the cloud' with capacity for a large number of simultaneous listeners. It

might be a helpful alternative when HF conditions are not co-operative. We are also working on a method to serve recorded bulletins and other audio items 'on demand'. Both can be found on the ARNSW website or arnsw.org.au/audio

The VK2WI station has surplus to present requirements an older style 70 cm FM repeater. While not the latest technology, it may be suitable for use in some part of VK2. It is a rack mounted Philips 815 with a separate receiver and transmitter and a set of mobile cavities. It is currently has crystals for 8600. This

channel would be useable within VK2 - beyond the Sydney region, subject to band plan availability. It does not have an interface controller. Expressions of interest will be considered from any duly constituted club or group within VK2 - it's free - if they are prepared to get it operational within six months. Offers - indicating how they would utilize it - will be accepted by email to callbacks@arnsw.org.au, before 31 December 2016.

At intervals ARNSW provides some Development Fund Grants and while none were made this year,

consideration is being made to offer some in 2017 to duly constituted VK2 clubs and groups. More details will be given in the February notes. The ARNSW Library team has just about completed the massive sorting of magazines. Currently there are no requirements for more magazines. Next year there may be a call to fill the gaps. It is planned to have the Library open on the Monday evenings of the 2017 upgrade course.

Season's Greetings - see you again in the February issue.

73 - Tim VK2ZTM.



Silent Key

John Somerville Innes VK2AUI

John became a Silent Key in October 2015 at the age of 81 years. Born in Canberra, John started his schooling there before the family moved to Sydney in 1939 where he completed his education. In the early 1950s, John did his National Service training in the RAAF. He continued in the active reserve becoming a Radio and Radar Instructor to the University of Sydney Squadron while he was studying there.

He started his working life in the 1950s, first in VHF communications before moving into the new television industry, at Channel 7 Sydney and then Channel 9 Brisbane with their transmitters, antennas and microwave links.

In 1960 John joined RCA as a field engineer in all their communication interests throughout the world. He became Chief Engineer of RCA Australia in 1966 until he went into a new business venture in 1973 in the field of transformer manufacturing but kept up his involvement as an independent consultancy to the radio and television industry.

In 1977 John commenced a new business in designing, manufacturing and installing AM broadcast directional antennas systems. He also became an importer of test equipment and transmitters to the Australian market. This - along with his highly valued consultancy

work lead to him form the company - Innes Corporation.

John obtained his Amateur licence in 1955 and remained an active Amateur operator, including writing several technical articles for amateur publications locally and internationally. He was a great mentor to many young engineers and largely regarded as the foremost authority on MF transmission in our country. John only recently retired from his business but kept abreast all that was happening in the industry.

Vale John VK2AUI

[Mathew Magee VK2YAP and Tim Mills VK2ZTM]



New Foundation Manual is available now

Your **Entry into Amateur Radio**.

The Foundation Licence Manual 3rd Edition is **now available** for purchase.

The Manual is attractively presented and contains all the information needed to qualify for the Foundation licence in Australia.

It includes the Foundation licence syllabus and other extracts reproduced with permission of the Australian Communications and Media Authority.

To purchase the Manual, order on-line at the WIA bookshop or obtain a copy through the learning facilitator at your local radio club.

http://www.wia.org.au/members/bookshop/page_data.php?id=113

SOTA & Parks

Allen Harvie VK3ARH



Photo 1: 9 Activators present for the weekend: Warren VK3BYD, Allen VK3ARH, Ken VK3KIM, Rod VK2TWR, Peter VK3PF, Ron VK3AFW, Crompton VK2HRX, Phil & Cathy VK3BHR.

Snowy Mountains SOTA Weekend 1st October 2016

Snowy Mountains SOTA weekend was an opportunity for new and experienced activators to activate summits in the Snowy mountain area.

This is a popular area due to the abundance of high scoring summits with good access. Rob VK2QR was key to this event as he lives and works in the area; so Rob did the ground work and arranged for accommodation at the Snowy Mountains Resort and Function Centre in Adaminaby as well as recommending summits to consider.

We decided to operate as groups to qualify known summits with good access and then swap during the day. This will ensure all gain the opportunity to qualify and see a lot of the Snowy Mountains. We broke off into groups consisting of Crompton VK2HRX, Warren VK3BYD and Allen VK3ARH in Compton's Troop carrier then Ken VK3KIM, Ron VK3AFW and Phil VK3BHR went in Kens Land Rover.

Peter and Rod were coming from Nimmitabel heading for the same area.

First Day (1 October 2016)

We activated six summits VK2/SM-059 (Big Badja Hill) VKFF-0138, VK2/SM-052 (Bald Mountain) VKFF-0212, VK2/ST-007, Dampier & VK2/ST-013 (Middle Mountain).

Peter VK3PF and Crompton VK3HRX had 23 cm equipment, so that was on the table. Given the solar activity, it was not surprising that 40 m was not behaving. There were enough stations to ensure all would qualify. Warren VK3BYD wanted to qualify the summits on CW, so worked HF. 2 m and 23 cm was used to keep contact, qualify summits and secure S2S contacts.

The process was simple: after ensuring that everyone had worked the other summits and had the summit qualified, we all packed up and headed to the next target. S2S, new Unique and another Complete for all.

Access to all summits was straight forward with 4WDs. The road for Bald Mountain runs along the ridge line. Big Badja Hill has access to the foot of the summit as long as you stayed right. Access to Dampier via Curranbene Creek Road had a shallow creek to cross.

Peter VK3PF and Rob VK2TWR qualified The Peak VK2/SM-068 using 2 m SSB and then moved on to meet up with Ken VK3KIM, Ron VK3AFW and Phil VK3BHR on Bald Mountain VK2/SM-052.

After we have finished on Bald Mountain we regrouped and proceeded to drive into the Deua National Park for the final summit. The main reason was to verify access as there were creek (river?) crossing and given the recent rain decided best to approach with backup. Fears were unfounded as the crossing point whilst full and active, was solid and not an issue for the 4WDs.

Peter VK3PF and Rob VK2TWR had qualified Dampier VK2/ST-007 then



Photo 2: Rod VK2TWR on Dampier.

headed off to qualify Mt Cowangerong VK2/ST-001 whilst I (VK3ARH) decided to grab Middle Mountain whilst the group headed to VK2/ST-007, Dampier. Middle Mountain was just off the Minuma Range Fire trail and involved a short but intense walk up. The rest of the group had reached and set-up on Dampier by the time I arrived. We qualified on 2 m working Peter VK3PF and by now our group on VK2/SM-052.

Once back on the road, Ken noticed he had misplaced the top portion of the HF antenna on his 4WD so headed back to find it. We repacked cars and headed back to

the accommodation. We made it back to base just on dark, in time for tea.

Day Two

VK2/SM-036 (VK2/SM-036), VK2/SM-033, VK2/SW-015 & VK2/SW-021

Peter VK3PF and Rob VK2TWR headed south from Rod's home in Nimmitabel to activate Delegate VK3/VG-034, Goonmirk Rocks VK3/VG-048 and Cottonwood Range VK3/VG-057.

All the sites activated had good access. There were a couple of creek crossings, boggy patches

and the odd gate. We had gained permission to venture past gates before heading off.

We headed off up to VK2/SM-036 whilst VK2HRX Crompton went off to VK2/SM-033.

Access was good. We drove to within 900 m of the summit, weaving through the scrub following a 'track' to leave the 4WDs in a position avoiding heading up into the snow. We got out and followed the track walking to the summit. The summit is lightly treed and was in full sun with the snow still present providing a perfect operating position. Contacts included VK3ZPF and VK1DI.

Once qualified, we headed off to meet up with Rob VK2QR, to qualify VK2/SW-015 (Granite Mountain). There was some concern as to access due to the recent rain and wind but the roads had been magically cleared of trees and the 4WDs took the boggy sections in their stride. We had five HF stations set-up: more radios than chasers! ZL1BYZ and VK1DI helped but the propagation was against us. The final summit for the day was VK2/SW-021 (Pilot Reef Mountain).

After a tour of the Turnut #3 Power station, we arrived back at the accommodation quite late and had to enlist the assistance of Ruth to act as barkeeper to secure a well-earned ale or two.

There were summits on offer for Monday to activate. Rob VK2QR met Crompton VK2HRX and Warren VK3BYD to activate VK2/SW-073 (Talbingo Mountain) on the way home.

Thanks to Rob VK2QR for coming up with the idea and then finding accommodation in a central location on a long weekend. His advice in planning which summits to attempt was invaluable. Gate closures and weather reduced the possibilities but in the end we had more than we could fit in.

Blogs Details

<https://vk3hra.wordpress.com/2016/10/25/01102016-snowy-mountains-sota-weekend/>



Photo 3: The Adaminaby Crew walking up to the summit of VK2/SM-036.

<https://vk3pf.wordpress.com/2016/09/30/an-october-2016-long-weekend-in-the-snowy-mountains-1/>

VKFF Team Championship Sunday 16th October

The inaugural VKFF Team Championship took place on Sunday 16 October. The aim was to promote the World Wide Flora Fauna (WWFF) program. Teams of between 2 and 4 amateurs were formed, and they activated between 0000 UTC - 0600 UTC from a WWFF reference area with a view of logging the most number of park hunters.

Eight teams took part:

- **'The Odd Couple'** comprising of husband & wife team Joe VK3YSP and Julie VK3FOWL - Churchill National Park VKFF-0621 gaining 33 contacts.
- **'Tassie Devils'** comprising Jonathan VK7JON and his partner Helen VK7FOLK - Narawntapu National Park VKFF-0005 for 63 contacts.
- **'Team Pezo'** comprising Peter VK5PET and Steve VK5ZEO - Mount Magnificent Conservation Park VKFF-0916 for 20 contacts.

- **'Team Kookaburra'** comprising Tony VK3XV and Mick VK3PMG - Ararat Hills Regional Park VKFF-0958 for 150 contacts.
- **'The Walkie Talkies'** comprising Paul VK5PAS and Marija VK5FMAZ - Monarto Conservation Park VKFF-0828 - 138 contacts.
- **'Special Ks'** comprising of Les VK5KLV and Peter VK5KPR - Upper Spencer Gulf Marine Park VKFF-1757 for 29 contacts.
- **'The Irresistibles'** comprising of Gary VK1ZZ and John VK4VHY (operating as VK4ZL) - Undara Volcanic National Park VKFF-0506 for 7 contacts.
- **'The Mad Mix'** comprising of Mike VK6MB, Nick VK6FSEA and Jarrad VK6FFAR - Wellington National Park VKFF-0657 for 26 contacts.

More Details - <https://vk5pas.org/2016/10/27/2016-vkff-team-championships-results/>

VK <> G <> ZL S2S QSO Party 22nd October

Andrew VK1AD have been discussing opportunities for a VK <> G <> ZL S2S QSO Party with

Mike 2E0YYY. We needed a window of 0630 UTC to 0830 UTC when there was little expected activity on HF, with 20 m likely to be the predominant band.

The event was promoted using the SOTA Reflector and Facebook page (<https://www.facebook.com/groups/37631909313/>). The idea took off with international commitments to chase. Before the evening there were 54 summits across Australia, New Zealand, Japan, England, Scotland, Wales, Germany, France, Finland, Bulgaria, Portugal, Ireland, Austria, Belgium, Greece and Switzerland alerted for activations.

This is not a new event, as synchronised SOTA activations known as the VK Spring SOTA QSO and VK Autumn SOTA QSO were well attended locally and also by a number of G, GM, GW and DL activators but has to be the largest so far.

There were several cancellations and a couple changes due to weather on both sides but this did not curb the enthusiasm making for a successful evening. Ed - DD5LP reports that there were 73 spots on the evening. <http://reflector.sota.org.uk/t/vk-zl-europe-sota-s2s-party-22-oct-16-0630-0830-utc/13999/174>.

The success of this event is down to the contribution made by everyone to ignore weather and persist with contacts. I am personally looking forward to the next one.

SOTA QSO Party Links

<http://reflector.sota.org.uk/t/vk-zl-europe-sota-s2s-party-22-oct-16-0630-0830-utc/13999>

<http://vk1da.net/blog/2016/10/24/sota-qso-party-22nd-october-2016-at-bobbara-hill/>

<https://vk1nam.wordpress.com/2016/10/14/vkzl-and-eu-sota-s2s-qso-party-22-october-2016/>

<https://vk3hra.wordpress.com/2016/10/26/22012016-vkzl-europe-sota-s2s-party/>



VK7news

Justin Giles-Clark VK7TW

e vk7tw@wia.org.au

w <https://groups.yahoo.com/neo/groups/vk7regionalnews/info>

Contest News

VK7 Takes out the RD!

Congratulations to all who participated in the 2016 Remembrance Day Contest. There were 18 VK7 amateur who submitted logs with the standout being Steve VK7OO with 688 points who came third overall. Congratulations Steve and VK7!

SOTA News

There are 101 newly identified summits that went live on 1 November 2016 along with an updated version of the Association Reference Manual (ARM). Thanks to Andrew Ryan VK3ARR who is a member of the Asia-Pacific Management Team who provided some shiny new GIS tools that made the task much easier! Thanks Andrew. The updated ARM, KML files and information is available from the SOTA web sites and SOTA-Australia Yahoo group.

Award News

Congratulations to Frank VK7BC who has been added to the Worldwide Antarctic Program award Honour Roll for working over 100 call signs from at least 20 different Countries in Antarctica. Great work!

JOTA/JOTI 2017

Thanks to Peter VK7KPC for information about NTARC's JOTA/JOTI activation. There were 85 Scouting people from eight different groups who visited the clubrooms and operated the various radio activities. A special thank you to the Northern Area Rover Crew, members of which set up and ran the JOTI operation. The activities



Photo 1: LtoR – Peter VK7KPC and Ross Smith, Trevallyn Scout Leader, getting electronic kits ready for JOTA. (Photo courtesy of Peter VK7KPC).

included VHF foxhunts thanks to Andre VK7ZAB. The foxes were hunted with PVC and tape measure Yagis thanks to Idris VK7ZIR using receivers from Bryan Ackerly VK3YNG.

The HF station was active throughout the weekend and Kevin VK7KTN's demonstration of slow scan TV via his Android tablet attracted considerable interest. The electronics kits were popular and the younger members did well with the radio and CW communicators. Peter reported that in excess of 360 Scout and Guide members attended stations around the state and that this is about double the reported numbers from last year.

Thanks to Tony VK7AX from North West Tasmania Radio and TeleVision Group for the information

on the Sunday JOTA activities in the North West. Tony was assisted by operators Ross VK7WP and Roger VK7ARN. Roger provided HF communications and Tony assisted Scouts and Guides with soldering and electronic kit constructions which was a great hit. VK7RDR and VK7RAA 2 m repeaters were used for JOTA contacts as well. A successful day with many Scouts and Guides enjoying the activities!

WICEN Tasmania (South) Inc.

WICEN Tasmania (South) has been servicing the Tasmanian equine endurance riding community for ten years and a favourite ride is held annually at Pyengana in Tasmania's North East in late October. VK7s ARN, CL, Allan, FCDW, FNED, FJAX, JGD, MBD, TPE and TW



Photo 2: Very wet Roger VK7ARN and Peter VK7TPE at a Pyengana Checkpoint. (Photo courtesy of Roger VK7ARN).

Photo 3: NTARC's Casserole Carnival Night. (Photo courtesy of Alvin VK7ADQ & Peter VK7KPC).



assisted with the ride servicing three checkpoints and the base in the community hall. It started raining during the Friday night and did not stop until late on Saturday afternoon which provided the first challenge. There were 80, 40 and 20 km rides and fluctuating power at the ride base presented another challenges during the day. All riders and horses safely negotiated the trying and wet conditions and the WICEN Tasmania (South) crew made for home late on Saturday. Thanks to all involved and Roger VK7ARN for the above report.

Northern Tasmanian Amateur Radio Club (NTARC)

The NTARC Casserole Carnival was held in October and was a great success with over 33 sitting down to enjoy the many casseroles and dessert dishes that were on offer. The quiz master Bill VK7MX then took

the group through four rounds of five questions with each table competing. There were many raffle prizes and even a "Lucky Bum" prize won by Phyl, XYL of Joe VK7JG. All tables passed the quiz and enjoyed the night. A huge thank you to Ivor for the concept and for organising the event.

Radio and Electronics Association of Southern Tasmania (REAST)

January 2017 will see the Linux Conference Australia held in Hobart Tasmania and REAST member Scott VK7LXX is organising a one-day mini conference during the week of events. This will showcase talks and demonstrations on software defined radio, amateur radio activities, open source radio protocols and modulation schemes, design of telemetry transmitters and adding radio to your internet-of-things projects. If you would like more information or submit a topic proposal then please contact Scott VK7LXX at jsbragg@scriptforge.org

The 23 cm QSO Parties continue on a Sunday morning after the broadcast with the group experimenting with different hills and mountains being used to test

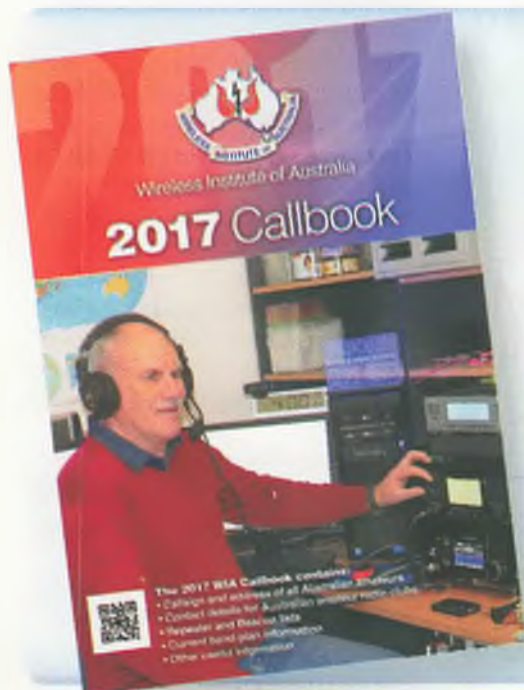


Photo 4: Kim Briggs VK7KB answering questions after his presentation. (Photo courtesy of Justin VK7TW).

propagation and passive reflector characteristics. WSJT JT65 and QRA are being used between the North and the South of VK7.

Kim Briggs VK7KB gave a great presentation on supporting the Scientific Program run by the Australian Antarctic Division. Kim started off with the Aurora Australis

ship and the many different aspects that it is used for and how it is used. Kim then covered the many different projects and programs he has been involved with supported by pictures and movies. A huge thanks to Kim and we look forward to the Antarctic communications presentation in 2017.



WIA 2017 Callbook

Available soon



VK3news Geelong Amateur Radio Club

Tony Collis VK3JGC

The 2016 WIA Oceania DX Contest

The aim of the Oceania DX Contest VK Club Award is for VK Club station members to make contact, within and outside of the Oceania Region, with as many other amateur radio stations as possible within the 24 hours on any of the 160/80/40/20/15/10 m amateur bands.

In preparing for the contest, the approach of the club was, once again, one of enthusiastic encouragement with talks in recent months bringing the Oceania contest to the attention of the members, a presentation on the installation, configuration and use of VKCL logging software by Bert VK3TU and reminders both via the club mailing list and the more active operators in our club that the contest was approaching.

Conditions this year however were **very poor**, as reflected in the table below, with even some of our more seasoned operators struggling to reach the target for the club award.

The figures tabled below, collated by Lou VK3ALB and to be submitted to the Oceania Team, are provisional:

Subsequent to the contest, the club held a **"Contest Review"** night to allow all the participating members to get together and exchange war stories and experiences from the contest weekend. The evening allowed the members to discuss tactics and explain their station setups and hear hints from the more experienced contesters on how to get the best out of contesting.

Changing Roles within the GARC Executive

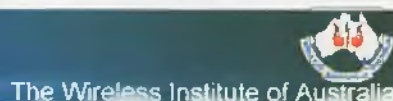
At the **2016 AGM** two significant Club roles were re-assigned: The role of President was transferred from Lou VK3ALB to **Chris VK3ACG** and that of Vice President from Tony VK3JGC to **George VK3AGL**.

The role of Club Secretary was retained by Vanessa VK3FUNY, Treasurer by Russell VK3KRS and that of Training Coordinator by Rex VK3ARG.

Club Achievements Summary Band Activity	Club Achievements Specific Band Activity
1500 contacts across five bands	160m 70 contacts & 3 call prefixes
Aggregate score - 330,130 points	80m 270 contacts & 17 call prefixes which was up on last year
179 unique call prefixes worked	40m 850 contacts & 109 call prefixes which was down on last year
232 unique call signs outside VK	20m 183 contacts & 75 call prefixes which was down on last year
22 GARC members participated	15m 79 contacts & 18 call prefixes which was significantly down on last year
Three Foundation operators on the air	10m 48 contacts & 1 call prefix which was up on contacts but down in prefixes from last year.



MEMNET



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

Please email memnet@wia.org.au with your email address, name and membership number.

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

Les Neilson VK4FAEB

BARC Club Auction on Saturday 22nd October

WE held a club auction on 22 October 2016 to raise money from the sale of Keith Adam's (SK) radio gear. The auction was conducted by Norm VK4ANB and raised a significant amount of money for his wife.

Well done BARC.

JOTA 2016 – Rochedale

Kevin Dibble Norm Bergen, Errol Walker, Len Eaton and grandson Les Parker, Tom Croft, Jan O. Doug VK4DMB, Bill VK4TWS and Richard VK4CAT were on duty at Rochedale.

We set up two dipole antennas using Norm's borrowed air cannon and after some false starts and the right air pressure we managed to get the ropes up into the canopy quite easily in the end.

Kevin got the Yagi rotator wired up and to actually move temporarily until the fuse blew, but it did work well after all, but still needs some work on it still.

Kevin also set up a 2 m station in the hall to talk directly to us at Samford.

We did have a lot of success on the HF Frequencies, however. We had some issues with interference between the two stations using the offset dipoles so close together on 40 m but this frequency was alive with contacts.

Norm and Errol made over 50 contacts on five different stations.

Len with his Grandson also worked 40 m and had some laughs along the way with a couple of hilarious comments between Rochedale Cubs and Pialba Cubs:

"My friend is going to be infested (invested) soon"

P(ialba): What sports do you play?

R(ochedale): Skydiving....what sports do you play?

P, after a short think: "I wrestle



Photo 1: Len VK4FIAA with some Cubs during JOTA.



Photo 2: Another group of Cubs participating in JOTA.

crocodiles"

R: "fibber!!!"

P: "well, if you can claim skydiving, then I can claim croc wrestling"

Les Parker and Tom Croft

managed the Yaesu in the hut on 20 m, 10 m etc. but the contacts died completely away and then resorted to listening to the other stations on 40 m.

Funny Story - These guys were perplexed by a beep beep intermittent sound that they could not trace, spending quite some time walking around trying to locate it but no luck.

Could it be a Bomb? A power source ready to blow up? Or something Jan was causing with his pet project? (at wits' end).

Kevin was then employed to find it and after some detection, he said it was coming from inside the console and left them to find it, but they couldn't.

So when Jan came down to ensure them that the problem was not him, they finally found that the old FM PA system stored in the bottom of the console was the culprit. It was beeping at them to tell them the battery was getting low. Relief all round and then they wanted to find someone to blame for all their worry! Wonder who they found?

Samford Girl Guides

Les Neilson, Jim Kelly, Brad Cuthbert and daughter managed the comms all day and we utilised the 2 m repeaters of Mt Cotton and Mt Glorious from around 12 noon to 5.30 pm.

I had three different radios to try out and two antennas; the stations were set up front and back of my car using the 12 V batteries.

I had a 2 m Tait and we were able to communicate with Beenleigh, Gold Coast, Wynnum and Salisbury too using the Mt Cotton repeater. Although it did not work well in the middle of the day, it came good as the temperature lowered. We also improvised by having the guides talk to each other from one end of the building to the other at the start of the day when comms was not working well for us.

On the front station, after some testing initially with the all-band Icom, I finally settled on my new QYT dual band radio using the Mt Glorious Repeater and doing a credible job all day. We communicated with Rochedale Scouts at the station managed by Kevin Dibble.

We also had at least one outside contact as well before Kevin went home. We put through well over 40 girl guides talking on 2 m and yes some of the Guides were very shy while others were so hilarious "I have a sister and one very annoying brother".

Silent Key



Photo 3: Frank VK4XX.

Frank Van Doore VK4XX 17th October 2016

Frank celebrated his 90th birthday early this year with all his family and radio friends.

He is survived by his wife Ann (married for over 60 years) and his children Theo, Frank, Jeff, Mareeann and Tony.

Frank arrived in Australia fresh from Holland with his wife and first baby on the way in 1953 ready for a new start. Once landed in Brisbane, he began his career in electronics in Australia working for Music Masters Co. involved in the manufacturing broadcast receivers.

Frank then joined Hills Electronics where he put in over 30 plus years - a stellar career.

Some of his highlights in the company were the Instigation the Telfix repairs for the company and he was able to design his own process for using recycled vacuum tubes thus reducing the cost of repairs dramatically for customers.

He was also instrumental in the company providing TV rentals for customers who couldn't afford the prohibitive up front cost of a TV at the time.

With his talents, the company talked him down to Sydney to become a senior manager for the firm and, being the success he was, later on they also talked him into moving to Adelaide to become a Director of the company in his later years.

Finally Frank retired back to Queensland to join the adult

family he had left behind. He began building up his communication capabilities constructing all types of antennas and equipment eventually amassing a very large array upon the skyline at his home.

Even the military services had a Helicopter fly over his place taking pictures of his antennas and satellite dish arrays.

At his final home at Calamvale he was still experimenting with projects building things for as long as he could.

Radio club days

Frank was BARC member for 26 years, joining in July 1990 and stayed active by joining in on many of the club activities over the years building lots of projects and always looking for ways to improve his hobby. Even as he got older and started to slow down, he frequently joined the morning and weekly nets for as long as he could hold a microphone.

Frank always encouraged young hams to enjoy the hobby even providing his old radios for them to learn on. We will always miss his happy disposition and positive attitude.

Thanks Frank for all your encouragement and efforts.

Frank loved to sing "You are my sunshine" to his wife throughout their years together. To send him off, we sung it once more again.

Have a great day.
Les Neilson VK4FAEB
BARC President



VK6news

Keith Bainbridge VK6RK

e vk6rk@wia.org.au

I'd like to start by wishing you all a Merry Christmas and a Happy New Year; I hope you and yours have a great holiday season.

PARG

We will start today with the latest from **PARG**, thanks to Paul VK6LL.

The last couple of months have been as busy as ever for PARG Inc. PARG is now meeting twice a month at the Mandurah SES base. The second Tuesday of the month is the business night followed by a little supper, coffee and the inevitable rag chew. The third Tuesday is a show and tell night plus a Q and A session where most things Amateur are thrashed out between lots of very tall amateur tales.

The club is working well with a steady increase in membership numbers.

Our club assessor Tony VK6DQ and facilitator Michelle VK6MLW have assisted three people to gain their Foundation licence along with one upgrade to Standard and one new Advanced licence, Miguel VK6SX.

It has been pleasing to note that the recently licenced club repeater VK6RMH (146.850 MHz) is seeing increasing use down in the Mandurah and Rockingham area.

PARG members once again assisted with the running of a portable amateur station for the 59th Jamboree Of The Air (JOTA) at Rockingham Scout Hall. Again the groups Mobile Communications Unit was pressed into service. This JOTA station has been increasing in popularity for several years and once again proved to be the best attended station in VK6! WA's Chief



Photo 1: The PARG JOTA setup 2016.

Scout Commissioner – Barbara de la Hunty – spent some time at Rockingham checking out the station and she came away very impressed. Most popular on the day was the EchoLink station which was linked via 2 metres simplex to the node of Martin

VK6MJ approximately 24 km south, in Mandurah. Big thanks to Michelle VK6MLW for the long stint at connecting Scouts from Rockingham to many different countries on the day.

The latest club project is the building of a private Mesh network,

for interested members. Our new network is utilising the 13 cm band. Various antennas are being built, bought and tested to permit communication between PARG members from Mandurah through to Rockingham. This is a very challenging project as the band needs absolute line of sight between stations and the coastal region is relatively flat. With the combination of a lack of hills and the foliage on tall trees, the search for suitable high locations goes on to enable every station to connect with at least one other node in the network. In addition, a Mesh tunnel is being created to enable a member in VK2 to link into the PARG Mesh network.

73 Paul VK6LL.

Interesting stuff Paul, you have been busy down there.

Bunbury Radio Club

Travelling further south we have the latest from Bunbury Radio Club thanks to Norm VK6GOM.

The next monthly meeting of the Bunbury Radio Club will be held on Saturday, 10 December 2016 from 2:00 pm at 21 Halsey Street, Bunbury. The activity for the day is Richard VK6PZT discussing Raspberry Pi and robots. Visitors are very welcome.

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

December 2016

Richard VK6PZT

Raspberry Pi and robots

February 2017

Bob VK66TJ

AM Broadcasting

March 2017

Shaun VK6PAL

AIIMS

The club's Christmas party was held at the Boyanup Tavern on 19 November 2016. Alek will have raffled the following prize: Zastone MP-300 dual band mobile transceiver.

All members are encouraged to attend and visitors will be very welcome.

Thanks for the update and I look forward to your reports next year Norm.

Fusion

Next we have an update on the Fusion scene here in Perth from Matt VK6ML.

Perth fusion was put up as a test to see how the Yaesu digital radio works. Since then it has been a long road to getting it working stable. The first node was hosted at VK6ML QTH in Beechboro and was a simplex node. Together with WARG, it was decided to explore the repeater side so all users could hear each other.

Yaesu fusion is a world-wide linking system via the internet and is digital.

You are able to send and receive pictures and messages also by directing the host node to the room you wish to speak in.

Perth fusion is hosted at VK6ML radio site in Brigadoon and runs in AMS. This means you can still use it as an Analogue repeater however, Wires only works in digital.

It has overall Perth coverage but better in the northern suburbs.

The system consists of:

- Yaesu DR1X Repeater
- WIRES X control HRI200
- SUN X2200 running VMWARE Windows XP, but can be a normal PC
- DIAMOND X500 Dual band antenna.
- Frequency is 147.025> 147.625 and the callsign is VK6RPT
- Duplexor 6 cavity system

Radios that can be used on this system are:

FT991, FT2d, FT1d, FTM100, FTM400, DV4 mini.

It's really good for when DX is not achievable.

In other countries you can cross link to DMR systems, brand master, D-STAR systems, P25 systems and analogue systems. More info can be found at yaesu.com

Thanks for the info Matt, best of luck with the repeater.

WARG

Speaking of repeaters, time for Anthony and the latest from WARG.

Firstly, our apologies for WARG's absence from these note the past couple of months – we will try and do better in future!

With the winter months making site work more difficult, effort has gone into rationalising WARG's spare and donated equipment stocks – our storage container has been cleaned out and reorganized with surplus equipment offered for sale to members or taken to Hamfest and much of it going to other good homes. Thanks to VK6s AXB, BDO, FROG, HKP, JAH, PII, RC, VHZ, ZGN, ZMS, ZRW and all others who participated in the working bees or helped in some way.

The All-Star linking system has been added to the Mt Saddleback 2 m repeater VK6RMS (node 44087) and work continues on preparing All-Star for Kellerberrin VK6RKN. Kellerberrin and Fremantle VK6RFM sites are also having upgrades to Yaesu's system Fusion repeaters. Thanks to Rob VK6LD and Bob VK6ZGN for their efforts.

Work is also continuing to get the faulty VK6RAP 70 cm repeater back on line and the faulty Cataby repeater VK6RCT. We hope they are back on air as you are reading this report.

A maintenance visit to the Tic Hill repeater site in October fixed some serious problems with the solar frame atop the 13 metre tower. Huge thanks go to Trevor VK6MS who used his considerable climbing and rigging skills to fix the framing and secure the panels. Thanks are also due to VK6ZRW and VK6POP for their part in the work.

Also on the subject of Tic Hill, after much discussion, WARG's August meeting saw a vote in favour of changing the callsign at Tic Hill – from the long-held "VK6RTH" to "VK6RYL". This proposal is as a lasting memorial to the work of Gillian (Jill) Weaver VK6YL, who sadly became SK in March 2016.

Deciding to change the callsign was not done lightly, but it was felt to be the most fitting tribute to VK6YL.

Whilst Jill had not been active in WARG since the 1990s, her contribution in the first 20 years of WARG's existence was outstanding. Will VK6UU and other key WARG members of that era agree that without VK6YL's unflagging drive to organise people and lead the work, the Tic Hill build would not have been so successful. Completion of this major project gave WARG members and supporters the confidence to tackle further site builds, laying the foundations for the repeater network we have today.

Some technical issues need to be solved before the change can actually take place, and a longer AR article is (hopefully) planned. (The story of Tic Hill – told in Jill's own words – can be found in the August and November 1981 editions of AR – available online via VK6UU's website at <http://www.armag.vk6uu.id.au/1981.html>)

WARG's final meeting for 2016 will take place as this edition of AR appears, on Monday 5 December 2016. Meetings take place on the first Monday of the month, or the second Monday if the first is a public holiday. A reminder: there is no WARG meeting in January. Our first meeting for 2017 is on Monday 6 February. Meetings are held at the Peter Hughes Scout Communications Centre, corner of Gibbs St and Welshpool Rd in East Cannington. Activities being planned for December and January include working bees at our Roleystone sites and another cavity-filter building and tune-up day. Dates for these are not yet confirmed, for updates, tune in to WARG's regular Technical and General net, Sundays on VK6RLM, 146.750 at 0230 Z / 10:30 local.

Thanks once again to Keith VK6RK for compiling these notes, and WARG wishes all a safe and happy festive season, we look forward to seeing you in 2017.

73 from Anthony VK6AXB

Thanks for the update Anthony; things are always busy at WARG it seems.

HARG

Moving up into the Hills now for the latest news from HARG, the Hills Amateur Radio Group.

The club was all geared up for JOTA when at the last minute the Guide Group we were hosting had to cancel due to a family crisis with the leader. As a result the club had opportunity for an impromptu and additional social meeting. It's always good to see the club's equipment getting a workout and members enjoying themselves. As usual, the carpark was a hive of activity. Steve VK6CS was demonstrating and trying different tuning arrangements with his home brew portable antenna. Marty VK6RC was showing off his new mobile shack whilst others just sat and chatted.

A typical afternoon at the HARG shack!

The activity following the October meeting was checking S meters to see how good they were. Ray VK6ZRW gave a quick talk on the RST system then tested member's radios. Most radios were pretty close at S9 but didn't track very well. The star performer was the TS-520S that Al VK6KIF had restored. Despite its age, it had the best sensitivity of the HF rigs tested and was pretty good on the S meter front as well. Someone was heard muttering: "They don't build em like that anymore!" The activity was popular, and with a few members missing out, we will probably do something similar in the future.

At the November meeting Steve VK6SJ will be demonstrating the FLEX5000 SDR. As of writing this it hasn't happened, but thanks very much Steve.

At this stage the club's Christmas Party will be held on 10 December 2016, but it may move to the 17th, so keep an eye the club's website. It's been a great year at the club with plenty of activities and a great social spirit. I am looking

forward to another great year ahead.

I would like to take this opportunity to wish all a Merry Christmas and a Happy New Year. I would also like to thank Keith for putting together the VK6 column each month.

HARG meetings are held twice a month at their club rooms at the Paxhill Guide Hall near the corner of Brady and Sanderson Roads in Lesmurdie. The social and practical meeting is held on the second Saturday of the month and the last Saturday of the month has the general meeting, often with a technical talk or demonstration. Doors open at 1.00 pm for a sausage sizzle and the meeting starts at 2.00 pm.

More information at www.harg.org.au

Thanks for the update Ray VK6ZRW; another busy club!

WAARN

Bob VK6POP has provided a report on the recently held meeting by two WIA Directors in Bassendean, so it's WAARN's turn to report.

Recently the WA Amateur Radio News team provided a venue for WIA Directors Andrew VK6AS and Paul VK5PAS to discuss their activities as members of the Board of the peak representative body for Amateur Radio in Australia.

Around 50 Amateurs from across the state attended the meeting to hear about the financial situation of the Wireless Institute of Australia and the proposal to conduct a forensic audit of the Institute to discover and document any issues with finances, policies, procedures and Director conduct.

During the meeting, the two Directors shared some of their experiences and outlined the sequence of events that lead to this proposal for an audit and the need to formalise processes and procedures within the Institute.

Many of the attendees used the opportunity of direct access to the WIA Board to express their



Photo 2: The EME dish radome.

concerns, ask questions and learn more about the inner workings of the Board and the Institute.

Amateurs expressed their thanks to both the Directors for sharing their time and effort with the WIA Board.

Andrew and Paul are both active Amateurs and if you managed to be on-air during that weekend you might have been able to work them whilst they were doing several World Wide Flora and Fauna activations from National Parks in the Perth Hills.

The meeting was also recorded on video and is available on the WAARN Facebook page.

Many JOTA stations were active in WA over the weekend in October, including VK6GGS, and here is a report from Steve VK6SJ on their activities.

VK6GGS, (Girl Guides - Seaward Region) participated in JOTA/JOTI for the third year running, this year from the Cambridge Scout/Guides

Hall in Perry Lakes. Gear set up included an 8 m Tilt-over mast with a quad-band steerable dipole (40-10 m), fed from an FT-2000 and SPE amplifier. Over 100 Scouts, Cubs, Guides and Brownies were able to communicate with other troops in Victoria, NSW, Queensland and around WA.

Of particular note was an hour long contact with VK2GGC in the Hunter Valley with the Coastal and Valley region guides. The supervising operators were Steve VK6SJ and Tony VK6CV. Supervising Guide leader was SWL Cassie. Steve was a previous operator at VK2GGC, where the inspiration for building the station at VK6GGS originated.

Next year, we have plans for a 3-6 m mast mounted on the roof of the Guide Hall with a tri-band Yagi and wire antennas for the low bands. The mast has been offered as a donation from a local Perth tower manufacturer.

The next event for the guides in Perth will be participation in the Jamboree celebrating a centenary Guides in Hong Kong where a special event station at the Jamboree will allow guides in all states in Australia to communicate with Hong Kong Guides on Christmas Eve. The Northern Corridor Radio Group has generously offered its club station for the event.

JOTA is certainly alive and kicking, thanks Steve, and to the generous Tower donator.

NCRG

Finally this month, the **NCRG** news.

It's been a very busy few months at NPSARC, the Sunday morning working-bees seem to have turned into a come out to the club any time you can and help build something!

We have acquired a 14 m long demountable (it had been a mine-site laundry) and that will be in place the weekend after the car boot sale in November. It's going to house our battery system, all antenna switching and filtering for all radio shacks and an office for our QSL collection etc.

It will free up much needed space around the rest of the building.

We have also recently acquired two 2.5 m dishes complete in their radome with all equipment to control them, when modified, for use on the 10 GHz EME band. This will hopefully solve the antenna problem I personally have at home and allow members to play EME at the club as well.

Considerable work has also been carried out on the earthing system and lightning protection after our mishaps earlier in the year. It's been a costly few months, but club funds have just about covered things.

The contest season is upon us as I write this, with a big effort by members in ODX and CQ WW SSB happening. Two visiting US amateurs, N6AA and W6XD, are flying in for the CQ WW CW contest and then



Photo 3: One of the Ellenbrook Guides at the operating desk.

spending a week travelling around the south of WA. It's nice to be able to accommodate top contesters at the club!

A new committee was voted in at the AGM in October 2016, with Anthony VK6AL staying as President, yours truly remaining VP, Chris VK6LOL swapping to Secretary and James VK6FJA swapping to Treasurer once again. Larry VK6NOL and Eddie VK6YA make up the remaining committee officials.

We have received comments that Amateurs would prefer Hamfest to be later in the year: is this so? Please let us know if you feel it could be better timed.

We also hosted the Ellenbrook Guides for their JOTA weekend, and they had a great time, with several expressing an interest in getting their licences.

On that subject the NCRG is progressing towards offering Courses and assessments once again, the planning is now in the advanced stage and hopefully we will be able to announce a starting date soon.

I'm sure I've missed out heaps, but we can always update you all next year.

So have a great Christmas, and may you spend the next new year doing all those things you couldn't fit into this one!

Now I'm retired I am hoping to become much more "Radio Active".

73 Keith VK6RK

Modern day radar interference

Jim Linton VK3PC

New long range over-the-horizon (OTH) radars are expected to begin next year in the Russian Arctic.

These devices track movements at sea and in the air, but also intrude to cause harmful interference to other radio users on their allocated band of frequencies.

The IARU Monitoring Service has observed the frequency-hopping nature of the technology.

It is used in Russia, China, Cyprus, Iran, and Turkey, covering wide sections of spectrum and is commonplace in the Amateur Radio bands.

A media report says that six new radar installations will soon operate in the Russian Arctic.

Wireless Institute of Australia (WIA) Monitoring System

Coordinator, Peter Young VK3MV intruders@wia.org.au issues a monthly report that aims to keep the Amateur Service bands clear.

Intrusions have been logged for some time and are constantly reported to the Australian Communications and Media Authority.

Intruder watchers are ready for the expected arrival of the new over-the-horizon radars.

Meantime the WIA reports existing observations of radar-type intrusions particularly on the 20 m and 15 m bands.

In other observations the 40 m band has daily music transmissions, voice and suspected military coded signals.

Peter VK3MY says it's important to keep reporting these types of intrusions, so the offending administration cannot claim that they are not causing interference as no reports are received.

These are being received by John Kirk VK4TJ mostly at strength nine, and other VK stations need to also file their monthly reports to give more ammunition for the IARU to complain to authorities.

More information and reporting forms can be found on the WIA website, or send an email to Peter Young VK3MV.

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

intruders@wia.org.au

'A picture is worth a thousand words'

Part 1: an Arduino Slow Scan TV generator

Dale Hughes VK1DSH

I recently became interested in Slow Scan Television (SSTV) systems and thought it would be an interesting exercise to build a SSTV signal source using an Arduino microcontroller. SSTV was originally developed in 1957 by Copthorne Macdonald WA2BCW (1) and has been significantly enhanced and widely used since its inception. SSTV signals are commonly heard on the high frequency amateur bands and they are even broadcast from the International Space Station on a fairly regular basis.

Like all things in our modern world, SSTV is going digital and a number of new transmission modes are based on complex image compression and error correction techniques (2) rather than the analog mode that is the basis of this article. Despite the move towards digital modes, the analog modes still offer very good performance and are relatively simple to implement.

Most contemporary SSTV operation takes place via PC based applications like MMSSTV (3) from JE3HHT but I wanted learn more about the technical details of the mode through building actual hardware. Microprocessors can easily perform the tasks required to transmit SSTV signals due to the relatively low speed and narrow bandwidth of SSTV signals. For these experiments the Arduino platform is ideal as it is readily available at low cost, it also offers good performance and ease of use through a free Integrated Development Environment (4). Aside from being an interesting amateur radio application, this project could form the basis of a STEM (5) project as it teaches many basic communication, microprocessor

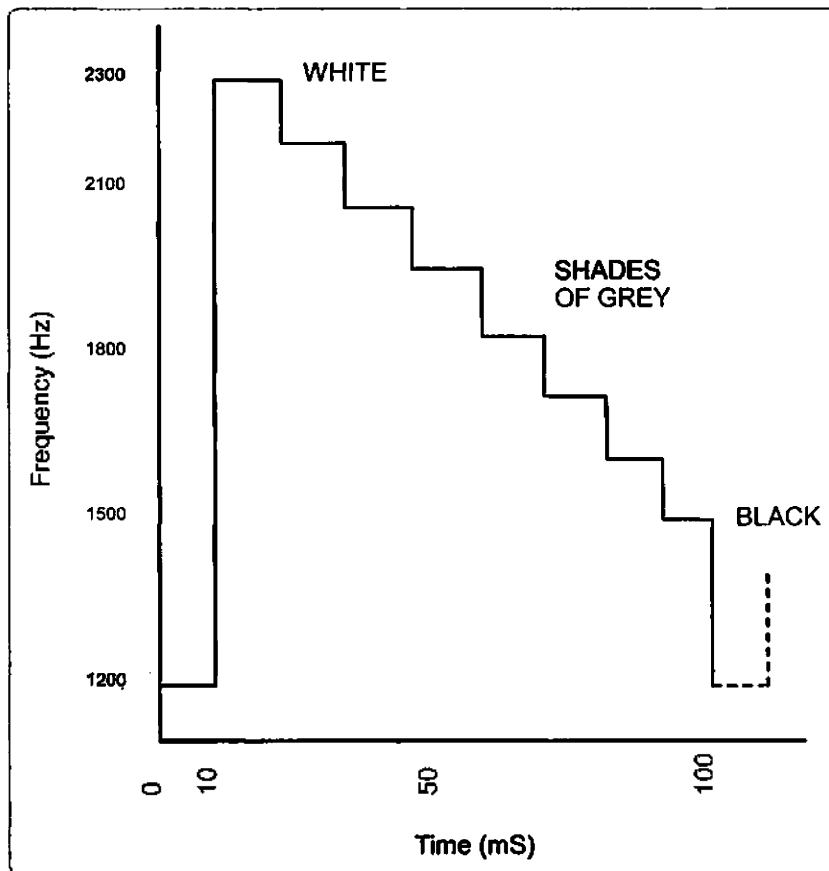


Figure 1: A typical video waveform transmitted by SSTV. The signal shown is 'staircase' or intensity steps starting at white and going down to black. The synchronising pulse level is 'blacker than black'. This staircase signal is implemented using function 3 of the Arduino SSTV signal generator described in this article.

hardware and software techniques at an inexpensive and accessible level.

SSTV background

Analog SSTV images are still images sent using a bandwidth of typically less than 1500 Hz, meaning that a standard voice transceiver can be used to send and receive images. The original and most basic SSTV format is 120 lines of 120 monochrome pixels sent in about 8 seconds. Even the relatively crude (by modern standards) 120

x 120 pixel image can provide quite reasonable quality images. Of course the original system didn't use the term 'pixel' as each video line was a continuous analog signal. Modern microprocessor based systems divide each line (or row) into a number of discrete pixels which are sent sequentially; we are all very used to this in our standard TVs and computer displays.

Over the years, SSTV modes have been developed that provide higher vertical and horizontal resolution (with and without colour),

but because of the requirement that the SSTV signal must fit within a standard voice channel of approximately 2700 Hz, higher resolution simply resulted in longer transmission time. So a 256 x 320 pixel colour image might take approximately four minutes to send, which may not be ideal, especially over transmissions paths that are noisy and variable.

While there are many variations on the theme, virtually all analog SSTV systems have a number of features in common:

- A vertical synchronising pulse marks the start of each image, this pulse is typically 30 milliseconds of a 1200 Hz tone.
- A horizontal synchronising pulse marks the start of each video line, this is pulse typically 10 milliseconds of a 1200 Hz tone.
- Black pixels correspond to a tone of 1500 Hz with a continuous range of brightness levels through to white at 2300 Hz.

Thus the synchronisation and video information is sent as a subcarrier that varies between 1200 Hz and

2300 Hz which then modulates the radio frequency carrier, usually as a Single Side Band signal for HF use, but Frequency Modulation on the VHF bands would also work very well. A typical video line might be 100 ms long, so a 120 line image would take 12 seconds to send. The waveform of a typical SSTV video line is shown in Figure 1.

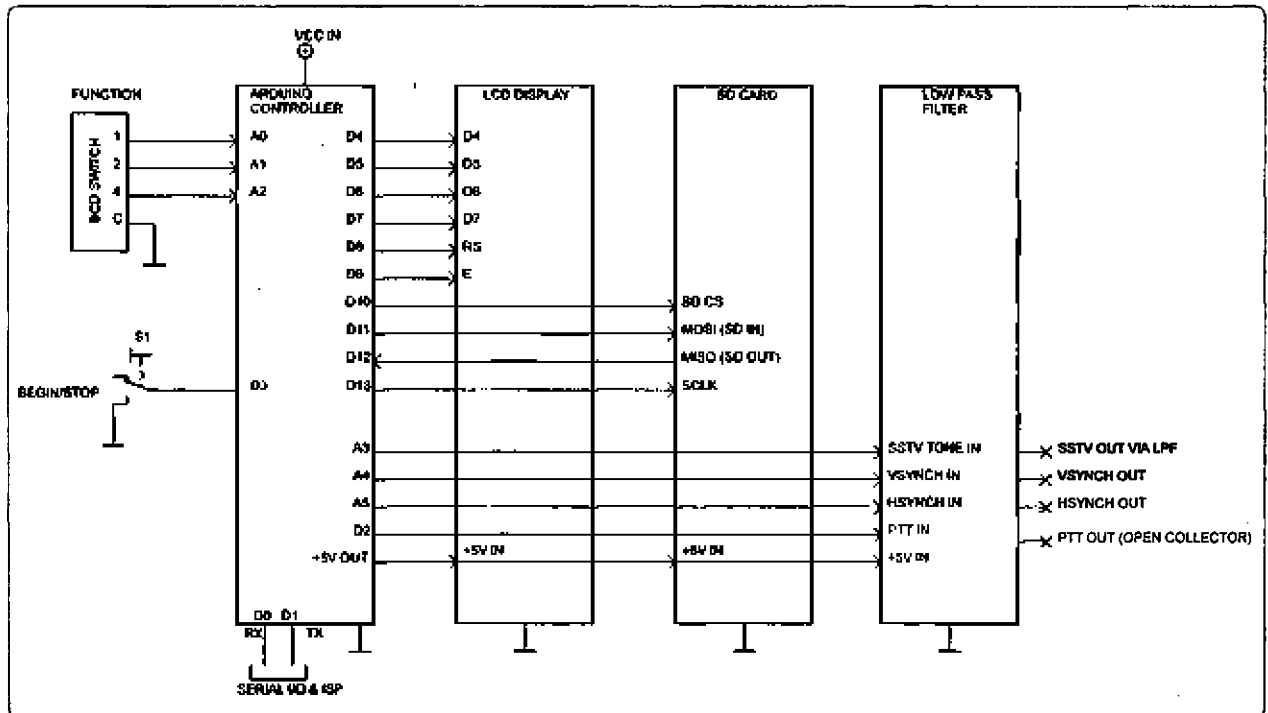
Note that different transmission modes may alter the duration of the lines (i.e. number of pixels) and synchronising pulses to suit particular needs and specific mode information may be sent by extending and modulating the vertical synchronisation pulse. This is known as Vertical Interval Signalling (VIS) (6) which can be used to automatically set the operating mode of a suitably equipped receiver; VIS sends 8 or 16 bits of information during the extended vertical synchronising interval by frequency shift keying (+/- 100 Hz) an vertical synchronising tone. Normal operation of the vertical synchronising system is not affected by the additional data bits.

While most SSTV modes send the vertical and horizontal synchronising pulses, not all receivers use them to display the image. A number of modes ignore the horizontal synchronising pulses and simply rely on accurate timing of each pixel transmission (7). Such 'free run' systems offer a number of advantages when operating over a noisy channel, however timing of both the transmitter and receiver must be identical otherwise the received image slants one way or the other.

The Arduino SSTV signal generator

As the SSTV signal is relatively slow and narrow band it is easy to generate using simple equipment. In this case the microprocessor reads an image file from a memory card and converts the pixels into a sequence of tones along with the necessary synchronising signals. The Arduino programming language has some very useful and easy-to-use instructions for tone generation and timing. The timing instructions are particularly useful as they have a

Figure 2: Block diagram of the SSTV generator showing module interconnections.



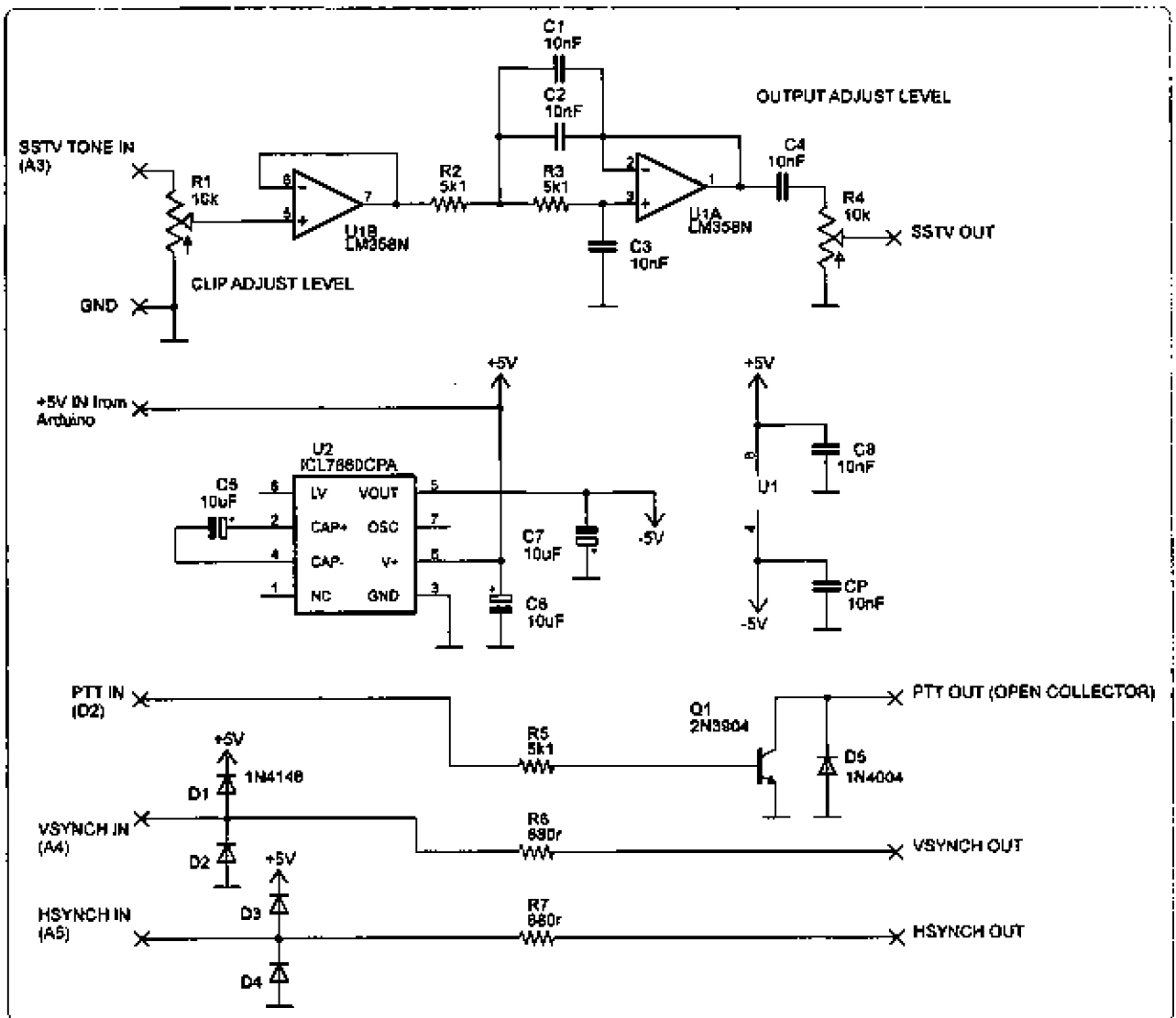


Figure 3: Schematic diagram of the low-pass filter and Press-To-Talk interface.

resolution of 4 microseconds which is more than adequate for SSTV signal generation.

As implemented this SSTV generator sends monochrome images of 120 lines by 160 pixels and each pixel can have one of sixteen levels of brightness. Each image takes twelve seconds to transmit and it operates using the SSTV mode known as Robot B/W 12 i.e. a 12 second black and white image and VIS is implemented so that suitably equipped SSTV receivers can correctly switch to the correct transmission mode. Station call-sign identification can also be sent as Morse code.

The Arduino hardware consists of a number of modules known as 'shields' and they are:

- A Freetronics 'Eleven' (8) Arduino microcontroller
- A Freetronics two line by sixteen character LCD display (9)
- A Jaycar datalogging shield (10) which contains a memory card interface (cat XC4536)
- A homebuilt low-pass filter and Press-To-Talk (PTT) output for connecting to a suitable radio transceiver.

Note that in general the Arduino processors and shields are interchangeable so that devices made by other manufacturers

may be used instead of the ones used in the prototype. The shields conveniently stack on top of each other making a compact module. Figure 2 shows the overall block diagram of the SSTV generator.

The SSTV output from the Arduino microcontroller is a square wave which must be filtered to remove unwanted and unnecessary high frequency components and this is done using an active low-pass filter with a cut-off frequency of about 2400 Hz. A LM358 dual operational amplifier (U1) buffers and filters the SSTV signal. Potentiometers R1 and R4 are used to adjust signal levels into and out

of the filter as required. A negative supply voltage for U1 is provided by U2 which is a conventional charge-pump device that generates the -5 VDC supply for U1 from the incoming +5 VDC supply.

The PTT control output is an open-collector transistor (Q1) with transient protection provided by diode D5. The PTT output is active during image transmission and CW identification. The horizontal and vertical synchronising pulse are available from front panel connectors with resistors R6, R7 and diodes D1 through D4 protecting the microcontroller output ports from damage due to a short circuit to ground or power. Figure 3 shows the low-pass filter and PTT interface.

The unit can be powered from a standard USB port which provides +5 VDC to the Arduino board, or from an external supply of about 7 to 10 VDC. The prototype unit was fitted with a small 240 VAC to 6.3 VAC transformer which supplies



Figures 5 & 6: Example images sent by the Arduino SSTV generator as displayed by MMSSTV.

approximately 9 VDC via a bridge rectifier and filter capacitor.

Modes of operation

The SSTV signal source can perform the following operations:

1. Send a 'slide show' of images read from a SD memory card. At the end of the slide show station identification is sent in Morse code
2. Send a single image showing the station call-sign
3. Send a continuous grey-scale bar image

4. Send a continuous frequency of 1200 Hz (the synchronising tone)
5. Send a continuous frequency of 1500 Hz (corresponds to black)
6. Send a continuous frequency of 2300 Hz (corresponds to white)
7. Send a Morse code station identification signal

The operating mode is selected using a Binary Coded Decimal thumbwheel switch and push button switch. Modes 1 and 2 are good for sending images and modes 3 through 6 are very useful for testing decoder circuitry and aligning filters etc.

Figure 4: The completed SSTV signal source. Any suitable enclosure can be used to house the transmitter as there are no critical layout concerns for the circuitry.



Image details

The images to be sent are saved in two separate folders on the SD memory card, the 'general' folder holds all of the slide show images and the 'ident' folder holds the single call sign image. Images are stored in a very simple format; each byte in the image file is a single pixel and each pixel can have one of sixteen values. Each image file is 19200 bytes long which corresponds to 120 lines of 160 pixels.

The SSTV image files are easily created from standard photographs or other diagrams and graphics using one of the freely available image processing packages. I use ImageJ (11) which can convert images of one format into another, change or remove colour details, adjust the brightness range of the pixels and then save the modified image in 'raw' format.

One minor issue with the Arduino signal generator is that the SSTV tone output is not phase continuous. When the Arduino processor changes tone frequency due to a pixel brightness change there may be an abrupt change in signal phase depending upon what task the processor is currently undertaking. This affect causes the white spots on the images shown in Figure 5; however there does not

appear to be any way to predict or prevent when the phase hit will occur.

During the development of this project I attempted to send higher resolution images, however the small amount of Random Access Memory (2 kbyte) of the Atmel AVR processor made it difficult to reliably transmit more than 160 pixels in each line. The main limitation appears to be the data buffering required when reading image details from the SD memory card.

Conclusion

A simple SSTV signal generator has been presented which can send 120 line by 160 pixel images over a standard voice channel. The test generator works very well and provides a signal source for over-the-air transmission or for testing SSTV receiver systems. The Arduino is an ideal platform for simple SSTV systems due to its low cost and ease of use. The Arduino source code is available to interested readers.

Figure 4

An Arduino based SSTV receiver will be presented in a subsequent article.

References

1. See "Image Communication on Short Waves" by Martin

Bruchanov OK2MNM which may be downloaded from <http://sstv-handbook.com>

2. See Bruchanov P. 94 for details of Digital Slow Scan TV systems.
3. For information about MMSSTV see <http://hamsoft.ca/pages/mmsstv.php>
4. See <http://arduino.cc> for more details and to download the IDE.
5. Science, Technology, Engineering and Mathematics. STEM projects are designed to encourage learning in these areas.
6. See Bruchanov P. 25 for VIS details.
7. See Bruchanov P. 24 for more details about synchronisation and timing.
8. <http://freetronics.com.au/collections/arduino/products/eleven>
9. <http://freetronics.com.au/collections/display/products/lcd-keypad-shield>
10. <http://jaycar.com.au/Kits%2C-Science-%26-Learning/Science-Lab-Equipment/Instruments/Arduino-Compatible-Data-Logging-Shield/p/XC4536>
11. See <http://imagej.nih.gov/ij/> for more information and to download ImageJ software

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