Amateur Radio

Volume 83
Number 11
November 2015
Price: $9.70 incl GST
www.wia.org.au

WIRELESS INSTITUTE OF AUSTRALIA

- Cheap frequency counter
- Design printed circuit boards
- Amateurs assist disaster recovery

Teamwork

Many hands get the job done

ISSN 0002-6859
11
02 685062

FT2DR

144/430 MHz DUAL BAND DIGITAL TRANSCEIVER

Advanced C4FM Technology Opens up New Vistas for Amateur Radio

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

YAESU
The radio

YAESU Authorized Dealer

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

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

YAESU Authorized Service Center

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

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

Volume 83
Number 11
November 2015
ISSN 0002-6859

Amateur Radio

The Journal of the Wireless Institute of Australia

All circulation matters
nationaloffice@wia.org.au

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

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

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

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

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

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

General

Technical

This month's cover
Teamwork in action: Members of the GARC working on a tower at the clubrooms. See the GARC report on page 49. Photo by Tony Collis VK3JGC.

Columns

Contributions to Amateur Radio

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

Back Issues
Back issues are available directly from the WIA National Office (until stocks are exhausted), at $6.00 each (including postage within Australia) to members.

Photostat copies
If back issues are unavailable, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

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

Amateur Radio Service

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

Wireless Institute of Australia
ABN 56 004 920 745

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

Representing
The Australian Amateur Radio Service
Member of the International Amateur Radio Union

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

All mail to
PO Box 2042 BAYSWATER VIC 3153
Business hours: 10am – 4pm weekdays

Editorial

Peter Freeman VK3PF

Cooperation and teamwork

On the last Saturday in September, I was out in the hills aiming to activate several SOTA summits. On the day in question, it happened that Tony VK3CAT was activating a similar combination of summits. I was starting the day on a different summit to Tony, and the plan was to following him as the day progressed, with me one summit behind. This was unlikely to be an issue, as Tony was planning on activating primarily on CW and I would be mainly using voice, with some CW when chasing Summit to Summit contacts.

Early in the afternoon I decided to omit one planned summit, thereby saving at least 90 minutes. I communicated this change to Tony via 2 m FM simplex. I ended up 10 minutes in front of Tony, with us both heading towards Mt Useful. The road was in reasonable condition, especially compared to an earlier section of road. As I was travelling along, I hit yet another pothole, but heard a pop in addition to the usual thump of the wheel hitting the edge of the pothole. Things then happened quickly: the engine sound changed and then became louder. The oil warning light came on and I noticed smoke behind the car. I was slowing down and looking for a spot to pull over without blocking the road. Then the engine cut out – all this inside a couple of minutes at most.

Once stopped, I pulled on the handbrake and jumped out to attempt to assess the situation. I saw fire under the engine!

I grabbed the microphone to the VHF/UHF dualbander and called Tony, advising that I had issues. I then started emptying my belongings from the vehicle. By time Tony arrived, I had as much out of the car as possible, with the cabin now filled with black acrid smoke.

Tony deployed his extinguisher with little effect: the fire had grown rapidly. No one was injured, so all one could do was be thankful, smile and watch from a safe distance as the fire engulfed the whole vehicle.

With no mobile phone coverage, Tony called from his car on 7.090 MHz for assistance. The only person willing to help was another amateur out activating a Park, but with good mobile coverage. Thus began the teamwork in communicating our location to the emergency services. After about 40 minutes, a home-based amateur called in to assist. Phone numbers were exchanged and instructions given to pass on the home-based amateur's number to the emergency services if they called back. Together we pinpointed our location more accurately, which was passed on to the emergency services. Between us, Tony and I kept a listening watch on the frequency, answering some later calls confirming details.

The CFA truck finally arrived almost two hours after the incident began. They dowsed the vehicle, which by now was simply a slowly smouldering burnt-out shell. Tony had already packed all of my salvaged gear into his car.

Eventually, we set off together towards civilisation and our respective homes, but we both completed quick SOTA activations of Mount Useful on our way!

Continued on page 5

WIA comment

Phil Wait VK2ASD

Punching above our weight

The International Amateur Radio Union (IARU) represents the interests of over 160 amateur radio societies like the WIA, worldwide, and indirectly the interests of about three million individual radio amateurs.

The IARU divides the amateur world up into three regions: Region 1 – Europe, the Middle East, Africa and East Asia; Region 2 – the Americas; and Region 3 – most of Asia and the Pacific, including us. These IARU Regions mirror the three regions of the International Telecommunications Union (ITU) which is the United Nations agency that deals with information and communication technologies, including the amateur radio and the amateur-satellite services. The Radiocommunication Sector of the ITU (ITU-R) manages the international radio-frequency spectrum and satellite orbits.

All Regions are very diverse, with a mix of large and small nations, developed and developing, with varying regulations and operating conditions governing the amateur service in each nation. Our Region comprises nations with very large amateur populations such as Japan (1.3 million - the world's largest), Thailand (176,000), Korea (140,000), rapidly growing amateur populations, such as Indonesia (27,000) and China (last count about 70,000), mature stable populations like Australia and New Zealand, and small isolated amateur communities like Fiji and most other Pacific Island Nations. The IARU is governed by an Administrative Council consisting of a President, Vice President, Secretary and two representatives from each Region.

It's important to us that the IARU is strong and able to work effectively within the ITU structure in order to protect the international interests of amateur radio, especially in relation to amateur radio spectrum and the amateur satellite service, and also to promote the value and interests of amateur radio generally. The IARU also maintains an International Monitoring System where a number of operators around the world monitor the amateur bands for intruders, or non-amateur radio stations, transmitting on amateur assigned frequencies, and brings intruders to the attention of the relevant authority. The IARU also maintains a number of international beacons and administers the *"Worked all Countries"* award, the oldest operating award in amateur radio.

As I write this Comment I'm preparing to travel to Bali, together with Peter Young VK3MV, for the 16th IARU Region 3 Conference, hosted this year by the Indonesia Amateur Radio Organization (ORARI). These conferences are staged every three years around each Region and are a chance for societies to get together and discuss the important issues. This year's agenda is very full, with intruders and interference, youth and amateur radio, harmonisation of bandplans, digital modes, ARDF, and disaster communications all on the agenda, to name a few. Conference submissions are publically available at *http://iaru-r3.org/16th-triennial-conference-of-the-iaru-r3-documents/*

It's going to be a busy week and I'm hopeful that some concrete decisions can come out of it.

The WIA is a strong supporter of the IARU and the critical role it plays within the ITU. Over the past few years the Institute has directed a significant amount of member's funds towards supporting the international work of the IARU, such as investigating the feasibility of a new amateur allocation at 5 MHz, harmonising the 7 MHz band, HF bandplanning, cooperation on regional disaster communications and so on. WIA past President Michael Owen VK3KI was the Chairman of Region 3 prior to becoming a Silent Key, and the three HF WARC bands came about from an IARU initiative, championed by David Wardlaw VK3ADW.

Australia has always punched well above its weight internationally, considering its population, and it's no different in international amateur radio circles considering the WIA has only about 4500 members. Nationally, the WIA is yet another example of how a representative organisation can exert significant influence in a pluralist society, much greater than the power of its members acting individually. However, in acting collectively, every now and then the WIA must make a stand for what it believes is in the best interest of amateur radio and its members, and sometimes not everyone agrees.

Recently the WIA Board became aware of a campaign, circulated by email, to lobby the new Minister for Communications to *"review the pricing of amateur radio licences, to bring them into line with other countries"*. WIA Director Roger Harrison was tasked with preparing

Continued on page 5

WIA news

Youth to grow amateur radio

A potential growth area for amateur radio is involving younger people as a wonderful *'for them'* and *'hands-on'* communications activity. A report to the IARU Region 3 Conference in Bali Indonesia (October 12-16) comes from the Region 3 Directors, that describes as an underlining theme, where the next generation of radio amateurs comes from, so that what is enjoyed today, can continue to provide benefits to the community.

The Directors note that there are other effective ways of making amateur radio grow, including reviving lapsed radio amateurs, broadening its appeal in a crowded marketplace that has many other activities, and tapping into the like-minded followers of the DIY Maker Fairs.

However, the report suggests a focus on Youth may be lacking by some Member Societies in our region. The PARA Kids Day event has a distinctive logo of a kid with the microphone and a tuned circuit, the WIA through its Foundation licence is finding it attracts some younger new amateurs, and activities for younger people is the JARL Ham Fair - there may be some other examples too. However the Youth theme is heavily promoted in the IARU Region 1, with the concept now also being taken up outside Europe. For example, YOTA (Youngsters On The Air). The IARU Region 2 has the ARRL showing a lead with its Kids Day to promote amateur radio to Youth.

The Directors suggest to the conference delegates that embracing Youth be considered now by all Member Societies, and that it be the theme with reports for the next and 17th IARU Region 3 Conference.

IARU 90 Award

To celebrate the 90th anniversary of the International Amateur Radio Union (IARU) founding in 1925, a very nice IARU award is being issued this year.

The award is administered by Soyuz Radiolyubitelei Rossii [SRR], the Russian Amateur Radio Union, on behalf of the IARU. A diploma is for QSOs with jubilee stations - that is the callsigns ending with 90IARU, by 10 different IARU member societies. Under the rules the 160 m, 80 m, 40 m, 30 m, 20 m, 17 m, 15 m, 12 m, 10 m, 6 m, 2 m and 70 cm bands may be used, in any mode that can be Mixed, CW, Phone or Digital. Valid contacts are between January 1 to December 31, which can be confirmed online, and so are their rules.

Award inquiries to *ua6yw@mail.ru*

Award details available via *http://iaru90.hamlogs.net/iaru/*

QSO checks available via *http://iaru90.hamlogs.net*

Amateur Qualification Levels

The WIA and the Australian Communications and Media Authority (ACMA) are aware of some discussion about the current US Technician amateur qualification, the equivalent Australian qualification and their application to amateur licensing in Australia.

The WIA has requested the WIA Registered Training Organisation to conduct an assessment of the US Technician qualification and the appropriate level of the comparable Australian qualification. The assessment concluded that the US technical class licence is not at a standard or depth required at the Australian Advanced amateur licence level and that it is at a level approximately equivalent to the Australian qualification required for a Foundation licence. These conclusions and suggested amendments to a number of legal instruments that clearly clarifies the anomaly have been discussed with ACMA staff.

ACMA staff have acknowledged the WIA's position and have undertaken to consider it and communicate further with the WIA about it. ACMA staff have also advised that any changes to the legal instruments would require consultation with the amateur community and would take some time to bring about.

ABC listeners hear about amateur radio

ABC Radio Capricornia 873 kHz in Queensland broadcast an interview on September 23, with Clive Sait VK4ACC, Secretary of the Rockhampton and District Amateur Radio Club. The interviewer Lisa Clarke in her regular segment *'Portraits: In the club'* named this particular session *'On the same wavelength'*.

In a five minute talk Clive told of the scope and potential of amateur radio, and what attracted him to the hobby. On getting his licence decades ago, he immediately sought to contact 100 different countries. He described how with a bit of experience, the worldwide pursuit allows the use of home built equipment, although commercially made gear dominates the activity these days. The ABC program listeners also heard Clive talk about direct contracts with space travellers, and portable operation, such as at the Old Sea Hill structure during the International Lighthouse and Lightship Weekend in August.

Editorial

Continued from page 2

Tony dropped me at home, only a short diversion off his route back to Melbourne.

Many thanks to all involved: especially Tony, but also Johnno and Col, and to the amateurs who assisted in keeping the frequency clear and maintaining a listening watch.

You can read a more detailed account on my blog – just search for VK3PF and you should find it. My blog has a link to Tony's blog for a slightly different account of events.

Until next month,

Cheers,

Peter VK3PF

WIA comment

Continued from page 3

a news item for the weekly VK1WIA news broadcast explaining the facts and warning of the negative consequences, and Jim Linton VK3PC followed up with a news item entitled *Danger! A no-fee amateur licence fee could mean no service.*

The other countries cited in the lobbying email are the United States, where *"amateurs are issued a licence for 10 years, requiring revalidation after expiry, with no fee"*; the United Kingdom, where *"amateurs are issued a licence for life requiring revalidation five-yearly, with no fee"*; and *"in New Zealand, amateurs are licensed under a General Users Licence, with no fee"*.

The proponents of this lobbying campaign are asking the Minister to direct the ACMA to drop Australian amateur licence fees to zero. They suggest writing a personal letter to the Minister in your own words, arguing that amateur radio's past and possible role in disaster communications deserves to be valued, as it is in *"many countries of the world"*, then citing the three examples above, along with the argument that a large number of Australian amateurs are pensioners, for whom *"the annual licence fee has seen some simply abandon their hobby due to the cost, and to the detriment of the nation"*.

As Roger explained, *"At first blush, the proponents of this lobbying campaign seem to have the interests of Australian radio amateurs at heart, particularly those living on a pension. However, in Australia, it is government policy that ALL spectrum users pay a tax for the use of spectrum - even defence; that is, the armed forces"*.

Let's be very clear about this: In no small way, since the introduction of Radiocommunications licensing almost one hundred years ago, the protection and status the amateur radio service has enjoyed under apparatus licensing has allowed us to have a seat at the table in the negotiations about the legislation and regulations that control us. If amateur radio was afforded the same status as the Citizens Band Radio Service, or garage door remote controls, the situation would have been very different.

The WIA believes the recent email campaign is counter-productive and against the long-term interests of amateur radio.

In fact, the NZART has told the WIA that they and many amateurs in New Zealand regret their introduction of the no-fee licence. It is obvious the outcomes of the Department of Communications Spectrum Review will impact amateur radio and change is in the wind, but we need those changes to be orderly and considered, and the WIA needs to be a strong advocate in that process.

Phil Wait, VK2ASD.
President, WIA

PS. Last month I encouraged you to log into MEMNET and check your email address and personal information was up to date. Well, what an embarrassment! The volume of database queries unearthed some interesting technical issues with the MEMNET Lost Password Reset feature, which emails a link to reset passwords, and also the password reset function. Thankfully all that now appears to be fixed, so for those who experienced difficulties, please try again and see if you can break it now. That's software development!

A really good 8-digit 600 MHz Frequency Counter for around $30

Jim Tregellas VK5JST

Introduction

Back in 2012, Adelaide Hills Amateur Radio Society (AHARS) acquired some 160 odd Weathalert units, which feature a single channel 2 metre receiver and LCD, and were typically used to advise those in outlying areas of impending threats such as flood or bushfire. These are now obsolete, courtesy of mobile phones and the internet, and so there are a lot around at very attractive prices. So here was a challenge for AHARS. What could be put into this very cheap and attractive case that would be useful to amateurs? One answer was a portable frequency counter which hopefully would cover all amateur bands up to 70 cm and with enough precision to ensure that any radio was well within its allocated channel width at VHF.

What eventually evolved was an 8 digit counter which gives 1 Hz resolution up to at least 60 MHz and with an optional prescaler which gives 10 Hz resolution up to at least 600 MHz. A 10 MHz timebase is used which can be directly replaced by a TCXO or rubidium/caesium beam standard if desired, and so what results is a genuinely professional specification and not bad value at all for $30. ☺ This counter can be placed into any box too. Details for using a TCXO or interfacing to a frequency standard can be found on the VK5JST web site (*www.users.on.net/~endsodds*)

Photo 1: The completed unit.

Basic Theory of Operation

A frequency counter works by counting the number of pulses in a given time. At the end of this "gating interval" the count is stored and passed on to the displays, which are then updated at the end of every following gating interval. Usually the gating interval chosen is 1 second (or a decade submultiple of 1 second) which makes things very easy. Just count for 1 second or 100 milliseconds or maybe even 1 millisecond, put the decimal point in the right place and Bob's your uncle ☺.

However, as is usual in electronics, things are not quite that simple. First we need a front end that can convert almost any normal waveform (sine, triangle, pulse,

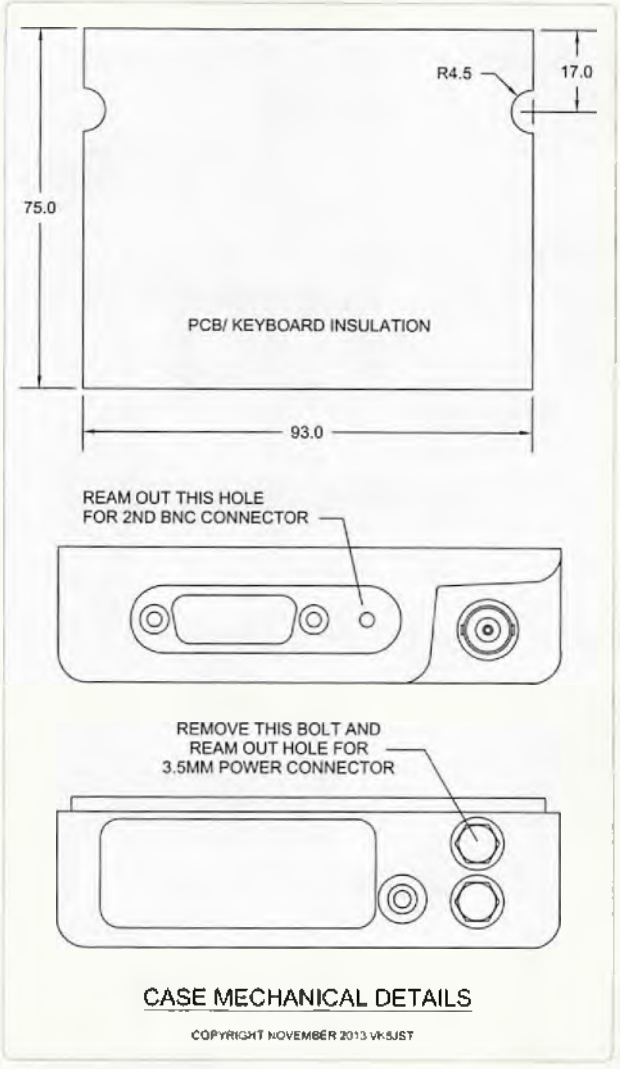


Figure 1: Case mechanical details.

distorted sine, square wave etc) with a very wide range of possible amplitudes, into a rectangular waveform suitable for driving the 5 volt digital counting logic. This front end must be AC coupled to get rid of any dc level in the input signal, and needs a lot of wideband gain to bring small signals up to reasonable levels (typically 1 volt peak to peak). Its overload characteristics must be first class so that it can handle big inputs without doing strange things like frequency doubling, and excellent overload protection must be provided so that it cannot be damaged by huge inputs. Following this front end is a circuit called a "Schmitt trigger". This takes the output of the front end amplifier, with its slow rise and fall times, and by using positive feedback, produces a nice clean rectangular waveform with the fixed amplitude and very fast rise and fall times necessary to drive the following counting logic properly.

As well as doing all of the above, the counter front end should offer industry standard input impedances,

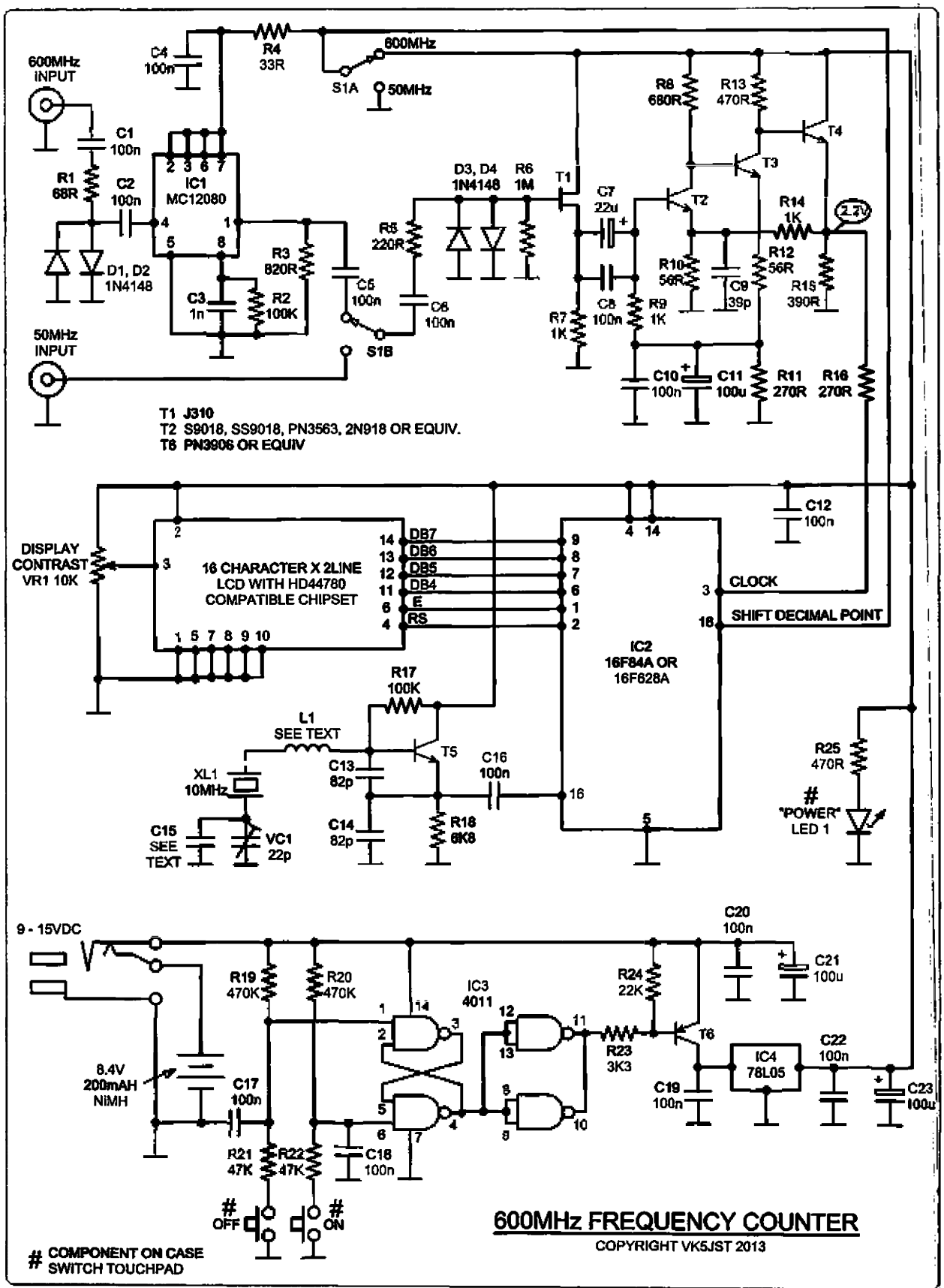


Figure 2: 600 MHz Frequency Counter.

The Ultimate in Portable Antenna

BUDDIPOLE

Dipoles, Slopers, Vees, Verticals or 'you name it' are just some of the antenna configurations possible with **Buddipole** components.

A Buddistick contains the following:

- 2 x 280 mm Anodized aluminium arms
- 1 x Stainless steel telescopic whip
- 1 x Multiband loading coil and coil clips
- 1 x 9.5 m radial wire on line winder
- 1 Mounting plate with SO239 adapter
- 1 x Compartmentalized portfolio bag
- 1 x Operating manual

The Buddistick deluxe kit also includes:

- 1 x Vertical antenna clamp
- 1 x Additional stainless steel whip

A basic Buddipole kit contains the following:

- 1 x VersaTee center section
- 2 x Stainless steel telescopic whips
- 2 x 560 mm Anodized aluminium arms
- 2 x Multiband loading coils and coil clips
- 1 x 7.6 m coaxial feed line with choke balun
- 1 x Black thermoplastic carrying case
- 1 x Operating manual

The Buddipole deluxe kit also includes:

- 1 x Portable 2.4 m mast and base tripod
- 1 x Rotating arm kit- change configurations
- 3 x Extra coil clips
- 1 x Additional telescopic whip
- 1 x Antenna system bag – padded nylon with shoulder strap
- 10 page modeling report

Accessories

Long (5.48 m) telescopic mast, Low band coils and extended whips, Shock cord whips and Shock cord masts, Light weight mini coils, Knurled whip protection sleeves, Switchable 1:1 2:1 4:1 baluns, Capacity hats.

All Buddipole components are available for purchase as individual parts.

Supplied by

tts systems

Phone **03 59774808**
Fax **03 59774801**
Email info@ttssystems.com.au

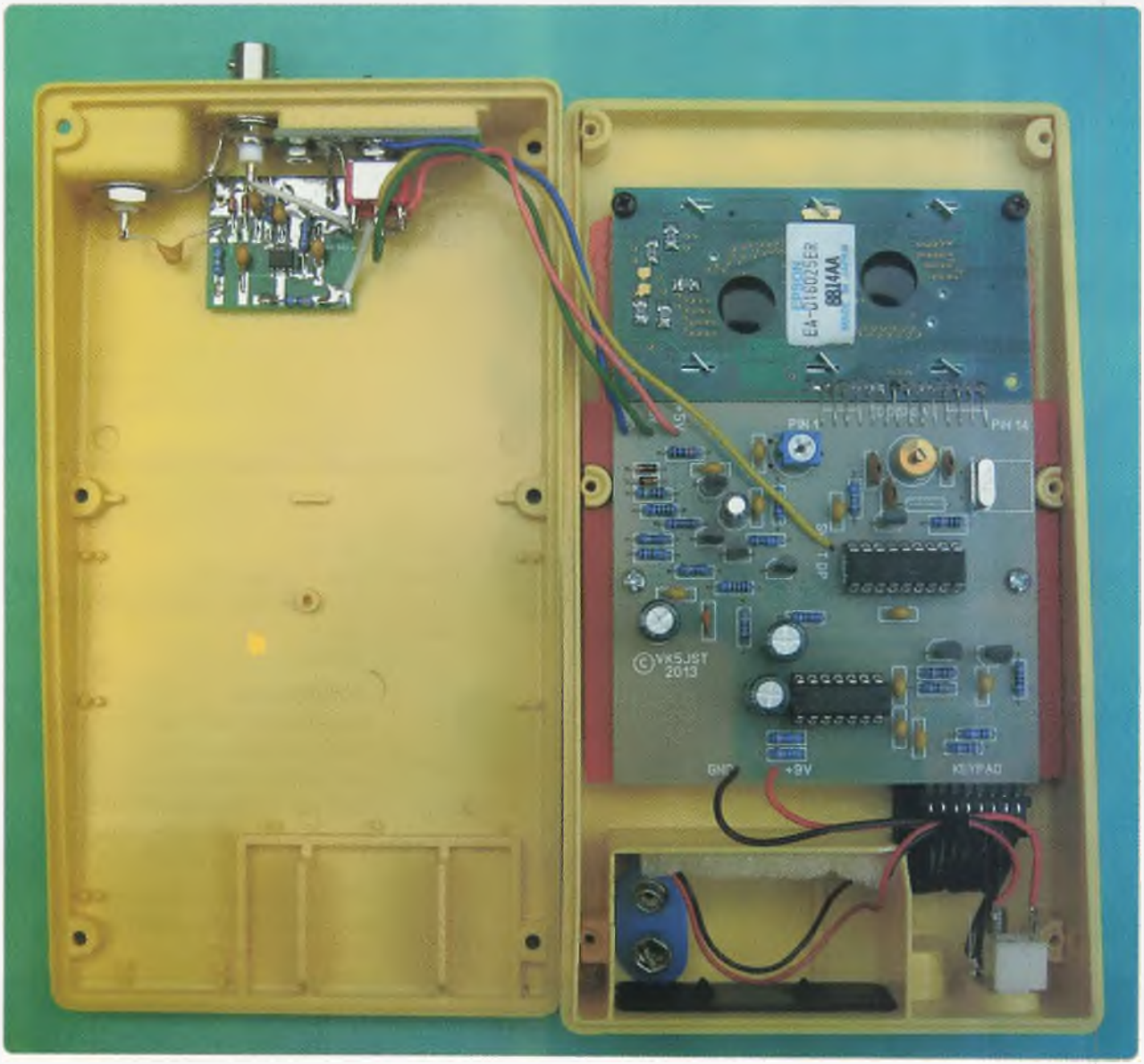
Visit our **new website** at ***www.ttssystems.com.au***

which are 1 megohm in parallel with 12 pF or so up to around 50 MHz and about 50 ohms beyond this frequency. These input specs. allow the use of a standard X10 passive CRO probe at HF to handle really big signals, or a direct interface to 50 ohm RF systems.

The last part of a good frequency counter is a precise "time base" from which the "gating interval" is generated. Professional frequency and time standards almost always provide outputs at standard frequencies of 1, 5, and 10 MHz (1 volt peak to peak into 50 ohms) with 10 MHz being the most widely used. The time base in any good counter will use one of these frequencies because it can be simply checked against, or replaced by one of these standards. Cheap imported counters often use weird frequencies like 13 MHz, or some odd microprocessor clock frequency which is a power of 2, making it impossible to replace the internal oscillator with an external frequency standard, and harder to precisely set up.

Coming now to the circuit, the counter has been built around a 16F628A microprocessor. When I started on this project, I first looked around the 'net, and at back issues of various magazines for ideas. And there it was a very clever piece of work by Phil Rice VK3BHR. On the net Phil describes a counter, inspired by IK3OIL, which is an updated version of his unit published in *AR* of September 2002. This counter uses a very simple front end and a very basic 4 MHz timebase made using an inverter

Photo 2: The counter with the covers open.



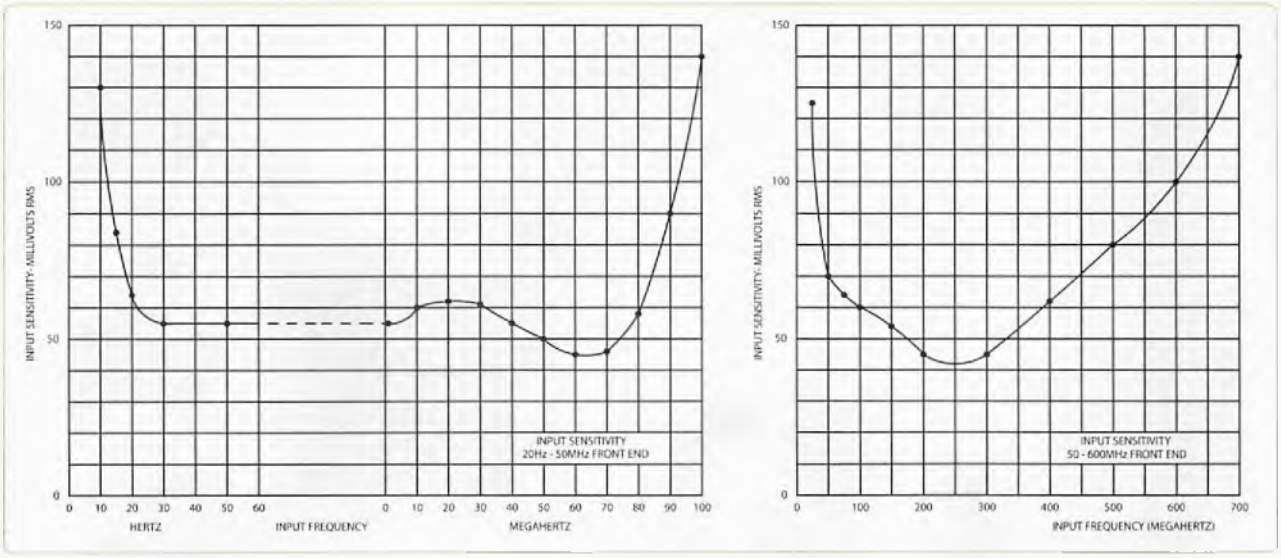


Figure 3: Frequency response.

inside the micro. It counts to around 40 MHz with reasonable sensitivity. It is very cheap, but none of this is the really clever bit. What is uniquely ingenious is the software inside the micro. No one else has even come close to writing software like this, which does everything digital inside a single cheap chip except for providing a precision timebase. All display driving, and all counting functions including provision of the input gating and Schmitt trigger functions are there. So rather than reinvent the wheel, I emailed him. And got instant cooperation. Code was changed so that a 10 MHz timebase could be used. Next, additional code was added so that a prescaler could be added. In parallel with this, I developed a really fast

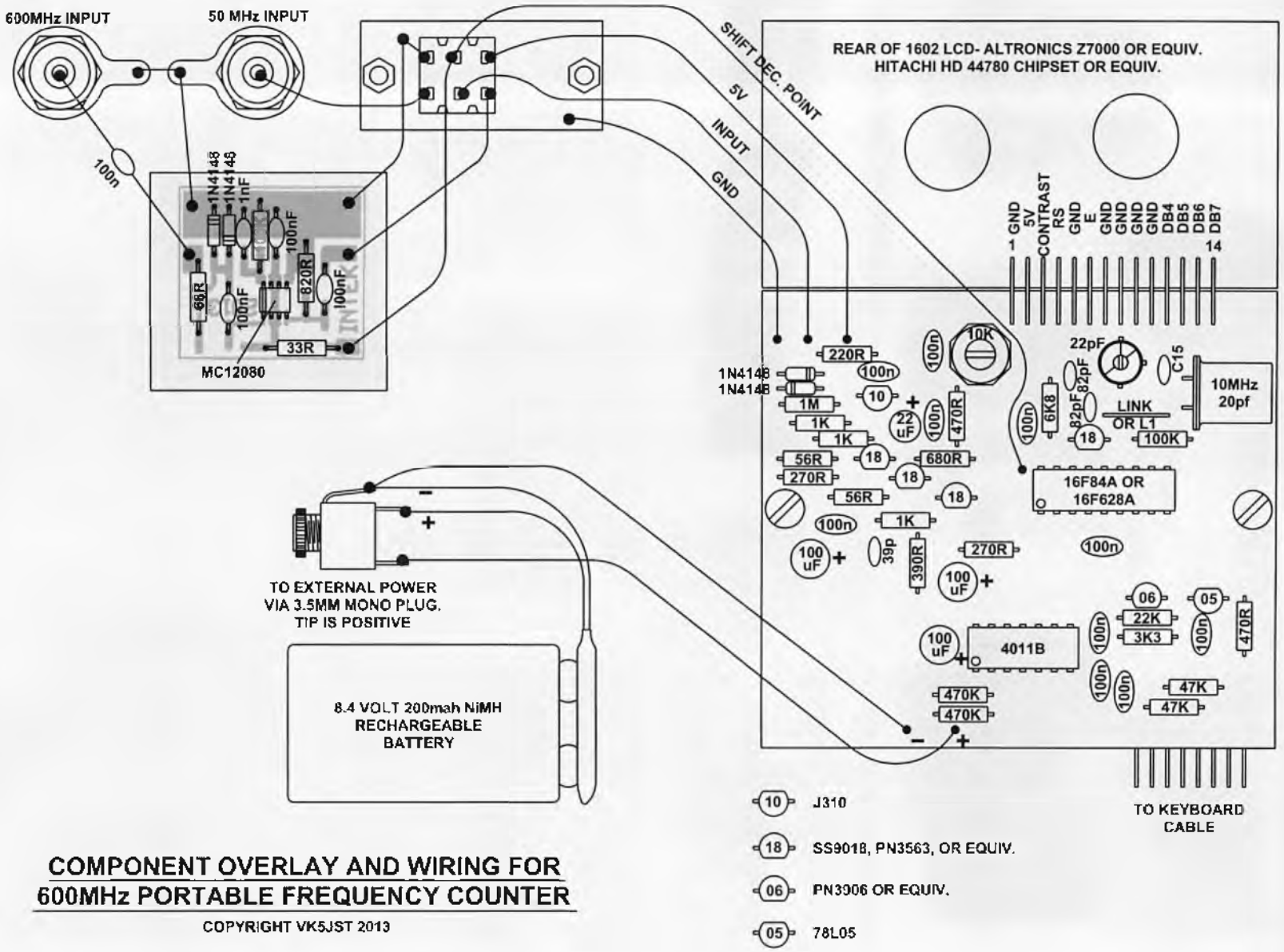


Figure 4: Component overlay and wiring for 600 MHz portable frequency counter.

front end, a prescaler, power supply and a good external quartz crystal oscillator. The resulting basic counter now counts to well above the 60 MHz spec. (many 16F628As actually go up to 105 MHz) and typically to at least 900 MHz with the prescaler. I think both of us are rather proud of the results of our mutual cooperation.

Circuit details

The prescaler IC1 handles all frequencies above 50 MHz and uses a ECL chip by Motorola (MC12080) to divide any incoming signal by 10. Input protection is provided by R1 and D1/D2 which limit the incoming signal to around 1.4 volts peak to peak. Unhappily, high speed emitter coupled logic dividers (ECL) often self-oscillate in the absence of an input signal, and R2 sufficiently unbalances the differential amplifier structure in the chip to prevent this. The output of this divider chip is passed on to the HF front end via S1. Note that when the prescaler is not in use, battery supply to it is switched off as a battery saving feature. S1A also switches the logic level on pin 18 of the micro to shift the decimal point when the prescaler is in use. Note that the input impedance of this circuit is quite high (several kohm) which has advantages in many RF applications. If you want an input resistance of 50 ohms to correctly terminate a cable, then use a standard 50 ohm through line terminator on the input BNC connector.

The HF front end has a similar structure with input protection again being provided by R5 and D3/D4. A source follower T1 provides a very high input resistance leaving the actual input impedance of 1 megohm/12 pF to be defined by R6 and the combination of the junction capacitances of T1, D3, and D4. T1 is followed by a wide band amplifier structure usually called a "diplet" (T1 and T2), which is actually a "triplet" in this circuit as it is followed by an emitter follower T4 to give a very low output impedance. Extensive DC feedback via R9 is used to stabilise the operating point, while ac feedback to R10 via R14 determines the gain and bandwidth. Note that transistors with very large transition frequencies and low junction capacitances have been deliberately selected. BC548s and PN2222s etc are not suitable.

In turn this front end drives pin 3 of the micro via a current limiting resistor R16. Under internal micro control, pin 3 can either be an input or an output. When used as an input it has Schmitt trigger characteristics and nicely squares up the output of the front end for counting. When counting is over and the "gate" is shut, pin 3 becomes an output shorting the signal from the front end to ground while the displays are being updated.

As previously detailed, the 16F628A does all counting, display driving, and with its internal counter/timer derives the "gate" interval of 1 second from the clock oscillator input on pin 16.

The external clock oscillator (T5 etc) driving pin 16 (input for the on chip oscillator) uses a grounded collector Colpitts configuration. Unlike the usual cheap clock oscillator made using an internal inverter in the microprocessor, this structure has the both gain and bandwidth to operate a crystal correctly at the industry standard loads of either 20 pF or series resonance. This is not the case if the inverter inside the micro is used, which is operating well outside mid band conditions and is thus not providing the required 180 degrees of phase shift through the amplifier. In turn this means the crystal has to shift significantly off manufactured frequency to provide the missing phase shift around the oscillatory loop and so cannot be adjusted to frequency at the specified load conditions. This oscillator is also far more stable than the micro inverter version because the very small temperature and voltage sensitive junction capacitances of T5 are buried nicely in the quite large values of C13 and C14. The frequency stability of the oscillator thus simply depends on the quality of the 10 MHz crystal used.

The last part of the circuit is the power supply. Because the Weathalert case has nice front panel touch switches, it was decided that they should be used, rather than knocking the case around and fitting a standard switch.

So two of the touch switches

are used to either "set" or "reset" an SR flip flop formed from two cross coupled gates within a 4011 by temporarily placing a "logic low" level on either pin 6 or pin 1. Two following parallel gates increase the current sinking ability of the switch logic. When pins 10/11 go low, T6 goes into saturation and its collector moves up to within 50 millivolts or so of the battery voltage, applying power to IC4 which in turn supplies a regulated 5 volts dc to the counter circuitry. Note that all of this on/off circuitry can be entirely deleted if you wish to use another box, and replaced with a standard switch.

When the supply is in the "off" state, the current drain is just a few nanoamps. This means that the battery will exhibit its normal "shelf" life as this current is much lower than the internal leakage currents within the battery. The current drain of the entire counter is a very modest 26 mA when on, and so least 8 hours of continuous portable operation can be obtained from a 200 mAH NiMH 9 volt battery. Note that the counter can be also operated from a recycled "wall wart". The very small units used to power mobile phones are often available for nothing from your local mobile phone outlet, as they get plenty of trade ins and repairs.

Assembling the Counter

The first thing to do is check the operation of the LCD by applying 9 volts dc to the Weathalert unit. Carefully inspect the rear of the LCD for added jumper wires. Straight out of the factory there were obviously some problems with these LCDs. If you want a high contrast display, the LCD can be directly replaced with a type Z7000 from Altronics. Next, prepare the Weathalert box for use by removing the unwanted parts. Undo the six screws which hold the case together and carefully break the case apart at the waterproofed case joint. Remove the rubber weatherproofing cover over the DB15 connector at the case top and undo the connector retaining screws. Remove the two printed circuit boards without damaging the front panel switch assembly or its cable and plug. Carefully retain all screws and nuts. Gently prize the blue piezo buzzer from the front panel.

If you are going to build the complete counter with VHF prescaler, rather than just a basic 60 MHz unit which only uses the main printed circuit board, you will need an extra input BNC connector. To install this, use a reamer to open out the spare 3 mm hole between the existing BNC connector and the DB15 connector mounting holes. Finally, as shown in the case detail drawings, remove the bolt nearest the case joint in the case top and ream out the remaining hole for the 3.5 mm power jack.

Next you should reclaim the 16 character 2 line LCD. Using a pair of pliers, roughly straighten up the gold plated pins which connect the display to its motherboard. Cut the plastic between each pin with sidecutters. Now with a soldering iron and pliers, remove each pin one at a time by heating and pulling from the motherboard side of the assembly. When you are finished, unless you are very lucky, the display and motherboard will still be held together with solder (but not the pins). Protect the display from heat damage by totally covering its back with a piece of aluminium or steel, and break the bond between the two boards by gently heating the back of the motherboard (where the pins were removed) with a hot air gun until the solder melts. Wave the hot air gun from side to side to

Counter Specifications

Frequency Range	
HF Front End	20 Hz – 50 MHz (prototype goes to 100 MHz with reduced sensitivity)
VHF Front End	50 MHz – 600 MHz (prototype goes to 1 GHz with reduced sensitivity)
Gating Interval	1 second
Input Sensitivity	See Graphs
Input Protection	
HF Front End	7 volts RMS continuous max. (1 watt into 50 ohms) Beyond this level use an X10 passive oscilloscope probe allowing measurements up to 70 volts RMS (100 watts into 50 ohms), or an X100 passive probe (max voltage usually limited by probe to 600 volts RMS).
VHF Front End	5 volts RMS continuous max. (0.5 watts into 50 ohms) Beyond this level use RF power attenuators, or a dummy load with a sampling output.
Input Impedance	
HF Front End	1 Megohm//12 pF
VHF Front End	Nominal 50 ohms when used with 50 ohm through line terminator
Power requirements	9 volts dc @26 mA
Resolution	8 digits giving 1 Hz resolution on HF range and 10 Hz on VHF range
Time Base Stability	+/- 10 ppm 0-60 C with recommended crystal
General Comments	Counter may be used with rubber duck antenna to remotely monitor a transmitter output frequency, and operated from an external power source such as a mobile phone wall wart or car battery.

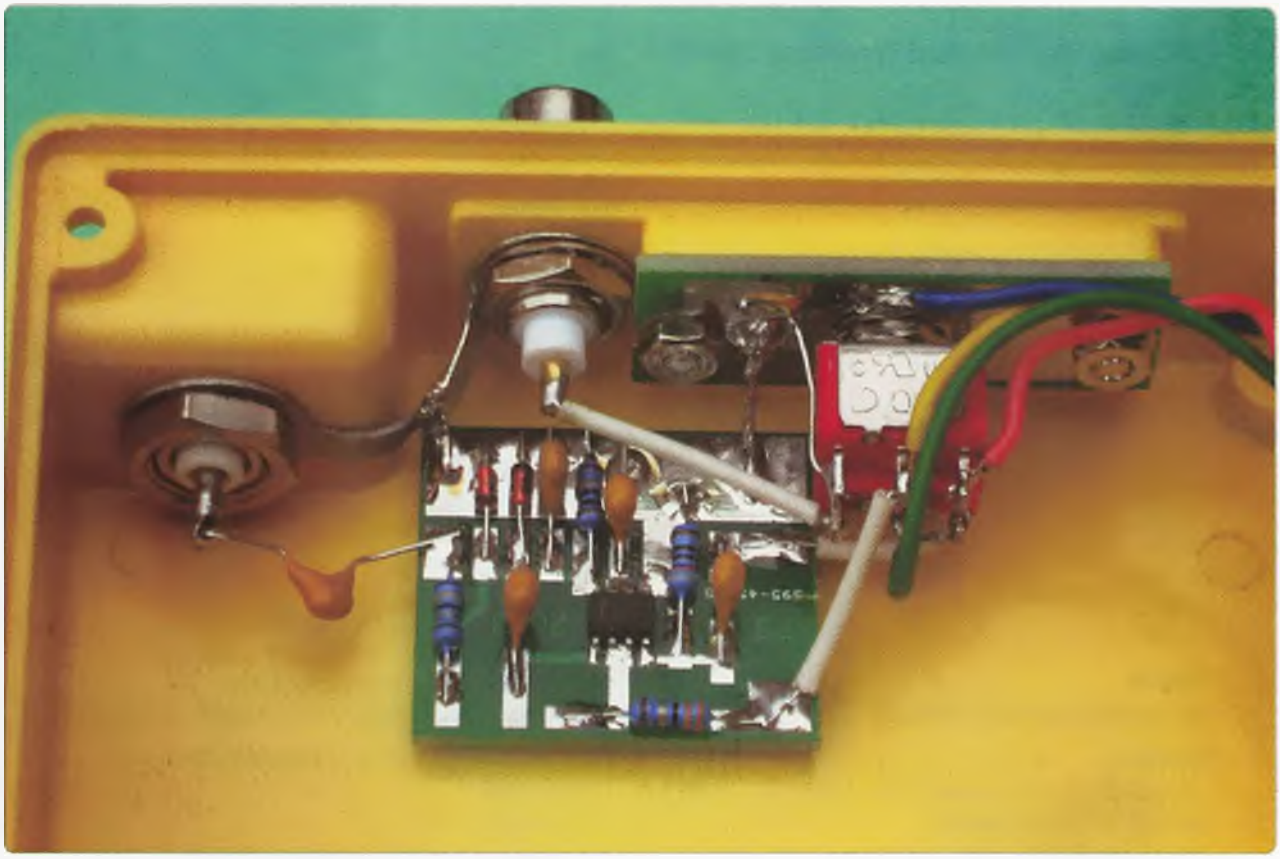


Photo 3: A close up of the prescaler board and switching.

evenly distribute the heat. Last, use a solder sucker to remove all solder from the plated through holes in the LCD.

Mounting all components on the printed circuit boards is next. In the standard external oscillator you can use virtually any 10 MHz crystal that comes to hand, provided it has reasonable frequency/temperature characteristics and ESR (< 40 ohms). There are three standard loads for 10 MHz xtals, series resonance, and 18 or 20 pF. For any parallel resonant crystal, L1 is replaced with a link. For a 20 pF crystal use a value of 27 pF NPO for C15. For an 18 pF crystal, C15 is a 22 pF NPO. For a series resonant crystal, L1 is a 10 uH RF choke and C15 is 56 pF. If your crystal has a wide adjustment tolerance, C15 may have to be changed to get the oscillator to operate at exactly 10 MHz.

Next assemble the prescaler board. The MC12080 surface mount IC goes on first, and then all of the through-hole components are neatly added around this chip. Keep the leads on all components as neat and short as possible.

The main counter board is then "stuffed" as the Americans say (I hope not!). Check every component carefully before insertion (measure each resistor with a DVM etc) and don't bend the component leads over after insertion into the pcb. Doing it this way allows you to easily remedy mistakes without wrecking the pcb during desoldering. Add the LCD to the assembly using neat little U shaped links made up from 0.5 mm dia. tinned copper wire. While you are adding these links, keep the edges of the two boards touching so that everything fits the case when you are finished. Use IC sockets. Once again this makes fixing mistakes painless and safe. So that the pcb is ready for final wiring, attach 6 flying leads of 150 mm or longer to those points shown in the component overlay. Use light multi-stranded plastic covered wire of various colours. Cut a piece of cardboard or thin plastic sheet to fit neatly between the rear of the main pcb and front panel switch assembly so that these items will be well insulated from each other. Provide cutouts in the cardboard for the case pillars to lock this insulation firmly into position. Connect the front panel keypad to the main board using the keypad cable. Finally screw the main pcb/LCD assembly into position in the case top using the two mounting holes in the pcb, self-tapping screws and the mounting pillars provided in the case. Insert both ICs. You can now test the main assembly by temporarily applying 9 volts dc or so. Tapping the power on/off switch should turn both the counter and the led power indicator on. Tapping the switch next to it will turn the counter off. The other switches are

Parts List for Weathalert Frequency Counter

Resistors *(all 0.25 watt 5% metal film)- 25 RESISTORS TOTAL*
1@ 33R
2@ 56R
1@ 68R
1@ 220R
2@ 270R
1@ 390R
2@ 470R
1@ 680R
1@ 820R
3@ 1k
1@ 3k3
1@ 6k8
1@ 22k
2@ 47k
2@ 100k
2@ 470k
1@ 1M

Trimpots
1@ 10k trimpot type VTU or equivalent

Capacitors
1@ 22 pF NPO 50 V disc ceramic (18 pF crystal only)
2@ 82 pF NPO 50V disc ceramic
2@ 1 nF monolithic multiplate disc ceramic 0.2 inch spacing
14@ 0.1 uF monolithic multiplate disc ceramic 0.2 inch spacing
1@ 22 uF 25 V aluminium electrolytic PC mounting
3@ 100 uF 25 V aluminium electrolytic PC mounting

Trimmer Capacitors
1@ 22 pF Philips (yellow body) or equivalent

Semiconductors and Sockets
4@ 1N4148
4@ S9018 OR SS9018
1@ J310
1@ 78L05
1@ 4011
1@ 16F628A
1@ MC12080
1@ 14 pin DIL socket
1@ 18 pin DIL socket
1@ PN3906

Mechanical
1@ panel mounting BNC socket with nut, spring washer, and solder tag washer
1@ 10 MHz 18 pF HC49S quartz crystal Element 14 p/n 98-10.000MEEJ-B
1@ 3.5 mm socket with changeover contacts
3@ printed circuit boards
1@ 8.6 or 9 V battery
1@ DPDT switch C&K 7201 or equivalent
1@ 500 mm length of 0.5 mm dia. TCW
1@ 8 pin header strip (from 40 pin snap strip)
1@ 180 mm length of rainbow cable or equivalent (6 colours)

Parts not required *(already in Weathalert case) or not normally used*
1@ 9 Volt battery snap
1@ 2 line x 16 character LCD using Toshiba HD44780 chipset or equivalent
1@ power led (on case switch assembly)
1@ touch switch assembly
1@ BNC panel mounting socket
1@ 56 pF NPO disc ceramic capacitor (C15-series resonant crystal only)
1@ 10 uH RFC (series crystal only- short out this component for other crystals)
1@ 27 pF NPO disc ceramic (C15-20 pF crystal only)

not used. With power applied, an all zero count should be visible after a couple of seconds, and after you adjust the display contrast trimpot.

The assembled prescaler board is then stuck into position in the case bottom section using thick double sided adhesive tape. Duplicate the exact position shown in the photo so that the lengths of input and ground leads are minimized. Next, the smallest printed circuit board is loaded with its DPDT switch and is screwed into the case using the screw holes that were originally used to mount the DB15 connector. Note that the copper side of this board faces into the interior of the case. All wiring is then completed as per the component overlay and your counter is now ready for testing.

Testing

All that remains now, assuming that you have wired the case and assembled the prescaler correctly, is to adjust the counter to correctly read frequency. This is simple, if you have access to a precision frequency standard. All that is necessary is to connect the HF input of the counter to the standard via a length of coax cable and then adjust the oscillator trimmer capacitor for a correct reading. You can then check operation of the prescaler by switching to the counter VHF input and attaching the "rubber duck" antenna. At a distance of around 3 metres or more, key your handheld VHF set and you should see the carrier frequency indicated on the counter. More extensive testing to verify sensitivity will require access to a frequency synthesizer.

Those without access to all this wonderful gear will have to use the old tried and true method of "zero beating" against a known

frequency standard. You will need a communications receiver tuned to WWV or WWVH on 10 MHz. The receiver should be set to receive AM and you should probably do this adjustment at night when HF is at its best. Drape part of the receiver antenna near the counter oscillator. You should hear an audio note which can be adjusted up and down with the counter oscillator trimmer capacitor. Adjust this for "zero beat". As you adjust the trimmer for an ever lower pitched tone, you will ultimately hear a chuffing sound. If the peaks of the chuff occur once per second, then the two frequencies are within 1 Hz. Do the best you can. Note that as the temperature moves away from that at which you made the adjustment (around 20 C), the indicated frequency on the counter will change. The very best quartz crystals will hold +/- 5 parts per million over a 0- 60 C temperature range (+/-5 Hz per MHz) but these crystals are rare and expensive. Crystals which hold +/- 10 ppm or +/- 15 ppm are much more common and so your counter could be off frequency at zero Celsius by as much as 15 Hz per MHz (1.5 kHz at 100 MHz). This is about the best that current technology can do without going to a TCXO or a crystal mounted in a temperature controlled environment but is adequate to ensure that a VHF rig is well within the wanted channel.

Anyway, that completes all construction. Enjoy using the little beast. Printed circuit boards, preloaded microprocessor chips, and other information are available from the VK5JST web site.

AMSAT-VK

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

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

Website:
www.amsat-vk.org

Group site:
group.amsat-vk.org

About AMSAT-VK

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

AMSAT-VK monthly net

Australian National Satellite net

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

In New South Wales
VK2RBM Blue Mountains repeater on 147.050 MHz

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

In South Australia
VK5TRM, Loxton on 147.175 MHz
VK5RSC, Mt Terrible on 439.625 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.

Band Plan Notes

John Martin VK3KAT

23 cm Information Beacons

It has been suggested that the 1296 MHz band plan should include a frequency reserved for use by information beacons, like the ones currently operating on 145.650 MHz. These information beacons are used to automatically transmit club information, WIA news items, CW practice material and so on. The ideal frequency for these devices is in the FM simplex segment, but not too close to frequencies used for two-way operation. A suitable frequency for the 23 cm band could be 1294.700 MHz. Any comments would be appreciated, especially if you are aware of any local use of 1294.700 MHz.

An introduction to PCB design using free electronic design tools, as applied to a VK3BHR LC meter

Erich Heinzle VK5HSE

Some time ago I used vero-board to build a PIC 16F84 based LC meter as described by Phil Rice VK3BHR in *AR* in April, 2004. In the spirit of reinventing the wheel, a bespoke PCB for the VK3BHR LC meter that would accommodate the newer 16F628 microcontroller seemed like a good idea. The free and open source gEDA electronic design software suite was used to design a suitable PCB on the free and open source operating system, GNU/Linux.

To provide an insight to *AR* readers unfamiliar with PCB design, a workflow has been presented for the gEDA design suite. The general approach is similar no matter which design suite is used. Other free and open source software available for PCB design that deserves a mention is the package KiCad. If you are going to invest time and effort in learning to use a PCB design tool, think carefully about whether or not you want to be locked into a proprietary software solution that may require ongoing and possibly expensive licence fees, or worse, may cease to be available at some point in the future. The worst case scenario is that you might learn to use a proprietary design tool that is later abandoned or superseded by the vendor. If the proprietary software uses a proprietary binary file format for the design files, your projects could be left stranded on old, unsupported operating systems. Another important point to make is that neither gEDA nor KiCad impose limits on the size of the PCB you design. This is unlike some commercial offerings with free "crippleware" versions allowing limited board area, and more expensive, fully featured versions for larger or more complex designs. Both gEDA and KiCad produce industry standard manufacturing files which can be used by any PCB manufacturer, unlike some "free" PCB design software that restricts you to a single PCB manufacturer.

If you are creating open hardware designs for use by amateurs, "Creative Commons" licensing or the Tucson Amateur Packet Radio (TAPR) open hardware licence are worth considering. Licences like this can help to protect your design from being commercially exploited in a way which deprives end users of their rights to share or add to the design as you the designer had originally intended.

Once a version of the gEDA suite has been installed, a new project can start. As with most electronic design tools, a schematic is the first thing to be created.

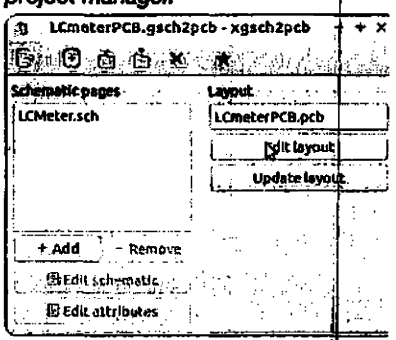
Name	Description	Size	Modified
backups	folder		08/04/15 23:21
symbols	folder		03/04/15 00:53
packages	folder		14/02/15 21:40
oshw-logo	folder		14/01/15 21:42
gerbers	folder		14/01/15 21:42
build photos	folder		14/01/15 21:42
HersheySans1StrokePCB_font	plain text document	34.7 KiB	02/04/15 23:48
gafrc	plain text document	104 bytes	15/01/15 22:25
gschemrc	plain text document	72 bytes	15/01/15 22:24
oldLetteringForPCB	plain text document	18.7 KiB	14/01/15 21:42
newproject.gsch2pcb	gEDA gsch2pcb project	0 bytes	14/01/15 21:42

Figure 1: A screenshot of a template project directory before being duplicated and renamed for the new project

However, before starting a new project in gEDA, a project template should be used to create a new project directory dedicated to the design. Suitable templates can be found on the web for gEDA.

To commence a project with gEDA, the project manager utility **gsch2pcb** can be used to coordinate the schematic creation

Figure 2: A gsch2pcb screenshot, the project manager.



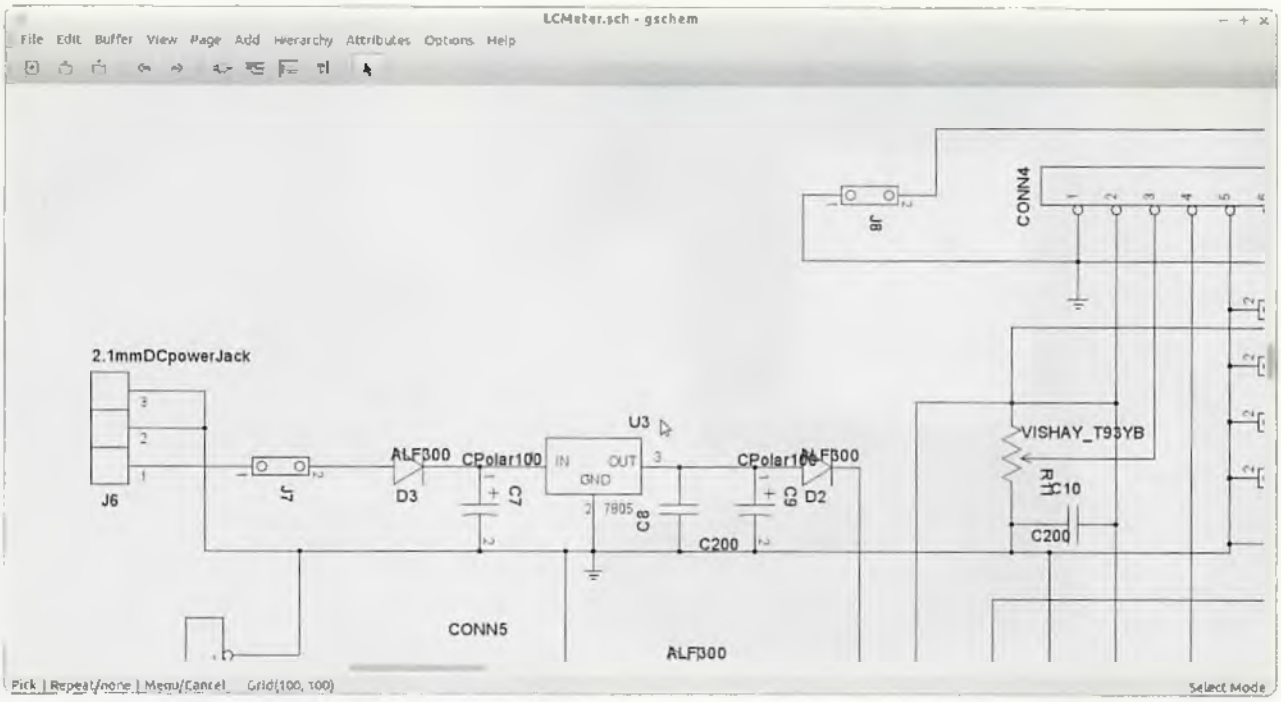


Figure 3: A screenshot of gschem, the schematic editor.

and subsequent PCB layout process. In the template directory, the project template should be renamed to *myproject.gsch2pcb* and launched with **gsch2pcb**.

The utility **gsch2pcb** can then be used to name and create a new schematic file and a new PCB layout file for the project.

In the gEDA tool suite, *gschem* is the software used for schematic "capture". It should be said that no electronic design tool is perfect, and all design tools suffer from what is sometimes called "the transistor

Figure 4: A screenshot of PCB, the layout editor.

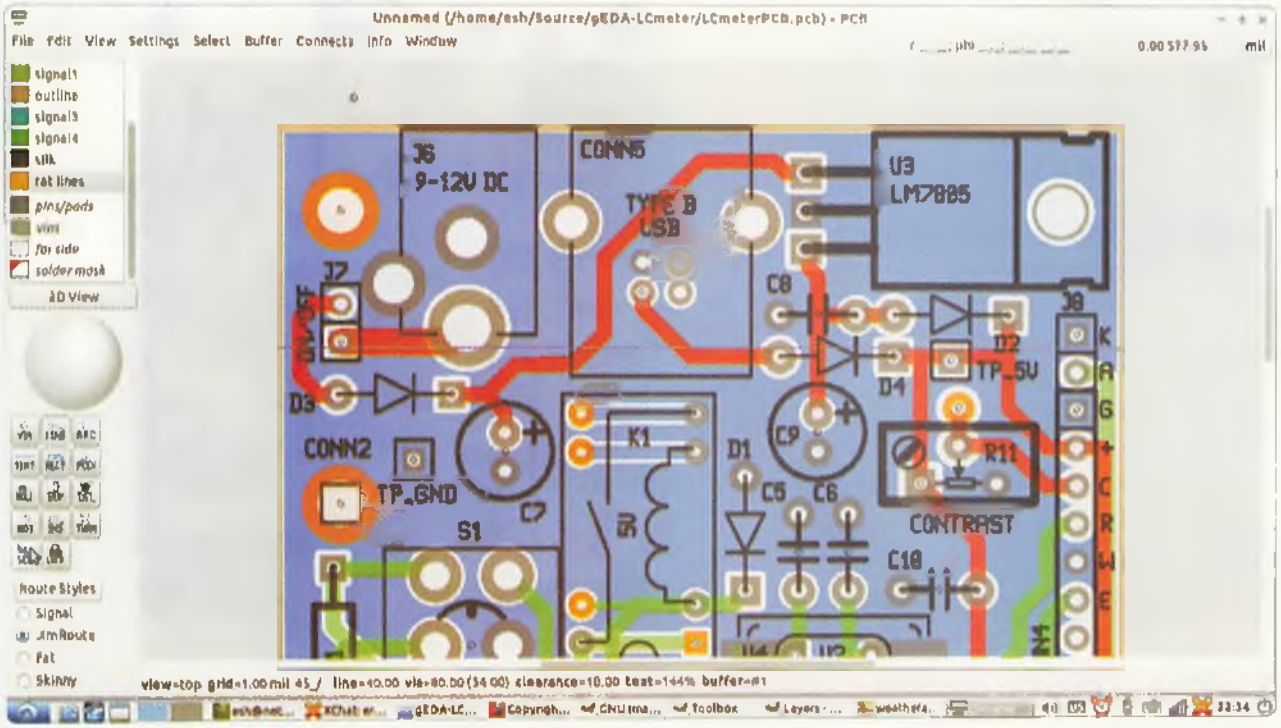
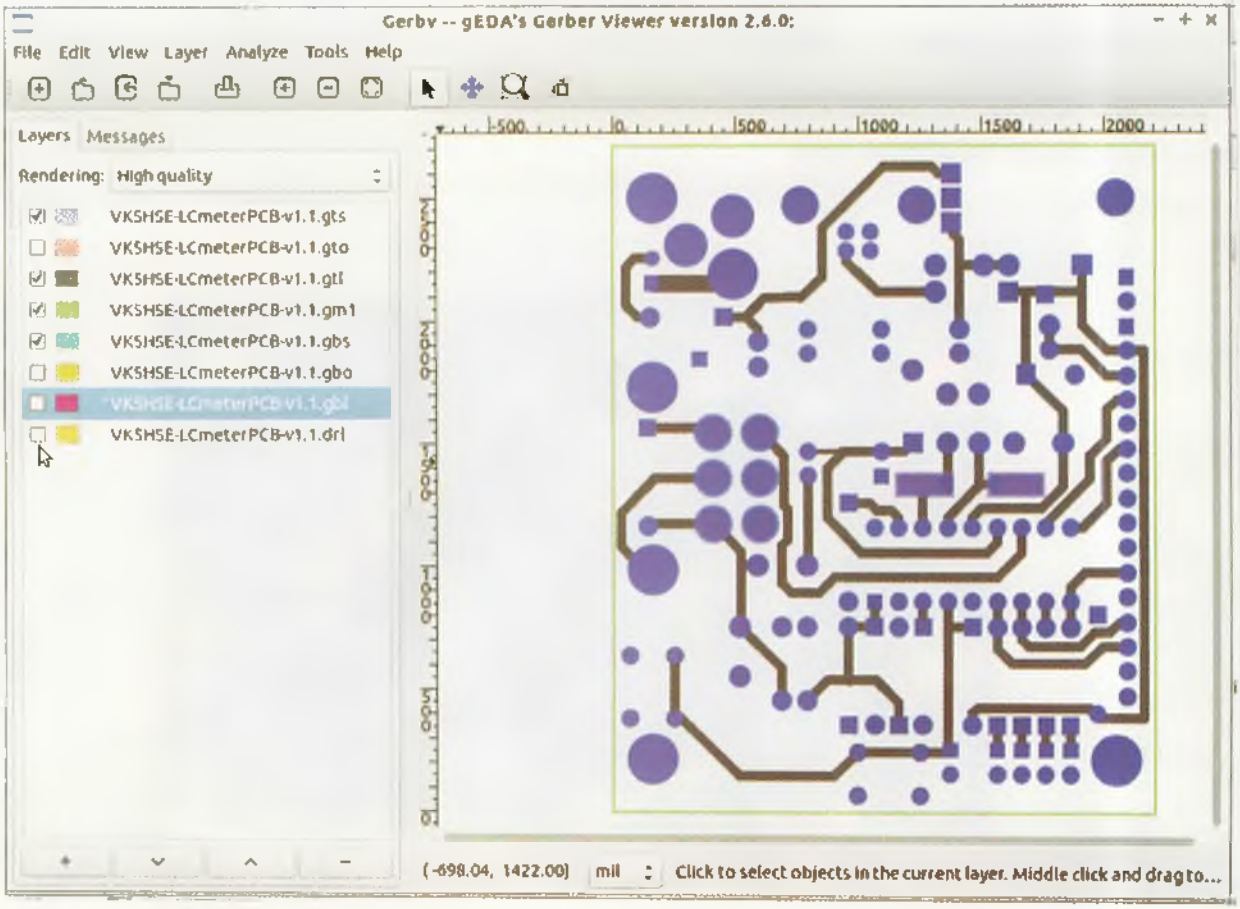


Figure 5: A screenshot of the finished design being exported as gerber files with hackvana.com compatible file endings.

Figure 6: A screenshot of the gerbv gerber file viewer being used to scrutinise the design before being sent off for manufacture. Note the different file endings for each layer's gerber file.



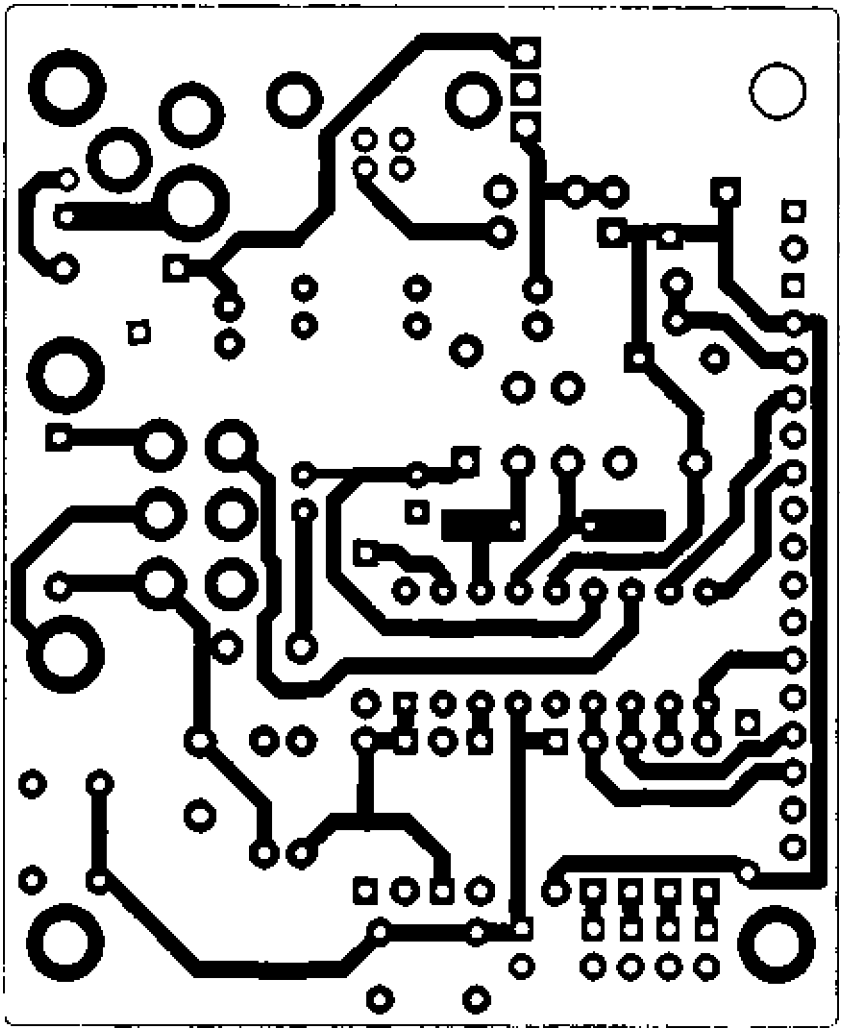


Figure 7: LC meter v1.1 top copper layer (600 dpi 56 mm x 69 mm).

problem". A TO-92 footprint is a universally accepted thing, but the mapping of collector, base, emitter, or drain, gate and source varies greatly, even for transistors with the same nominal part designator. Accordingly, when assigning a footprint to a symbol for the first time in *gschem*, whether it be a diode, transistor or other polarised component, one must subsequently check on the PCB layout that the pinouts are behaving as expected. If not, a footprint in gEDA can be modified in a text editor to make the pinouts behave. The revised footprint can then be saved in the packages folder of the template directory and used for all of your subsequent designs. Over time you will accumulate a set of validated footprints that are compatible with the devices you routinely use. Once you have an effective workflow with a collection of some of your favourite footprints, you will be surprised by how quickly you can prototype a PCB.

In *gschem*, the LC meter schematic was laid out and component footprints were then assigned to the LC meter schematic. It should be reinforced that saving regularly is important with any software.

One of the biggest challenges for new users is finding the right footprints for components. There are on-line symbol repositories which supplement the default set of footprints supplied with gEDA, and the biggest ones include *http://www.luciani.org/geda/pcb/pcb-footprint-list.html and http://gedasymbols.org* Similarly, there are symbol and footprint repositories for KiCad. There are also online footprint generators for gEDA, as well as documentation for creating your own, if the need arises.

The 5V DIL relay in the LC meter is a case in point. It turns out that pin-outs vary between brands, so the PCB was designed with smaller tracks joining some of the pins which can be cut easily if one of the more unusual relays is used by a builder. There are practical limits to how versatile a PCB design can be made, but a good philosophy is to use the least exotic components possible and to maximise the options for a home-brewer trying to source parts. Similarly, the crystal footprint combines a surface mount (SMD) and through hole footprint to increase the options for builders scrounging parts.

The PCB layout editor in gEDA is very matter of factly called "*PCB*". Once the schematic was fairly complete in *gschem*, *gsch2pcb* was used to launch *PCB* and update the layout. The generation and export of the *netlist* used by the PCB layout editor is taken care of by **gsch2pcb.** Put simply, the *netlist* is a file containing all of the connection details for the schematic, which allows the PCB design tool to subsequently establish what things need to be electrically connected to what other things. Incidentally, exported *netlists* can also be used for modelling in circuit simulators, but that is a distraction from our discussion of PCB design.

The software, *PCB*, allows tracks to be routed and layers defined to satisfy the wiring requirements defined by the *netlist*. In *PCB's* preferences for a given board, layers can be defined and associated with different signal, power or ground planes. A separate layer, the *outline* layer, is used to define the board outline and other

milled holes. When *PCB* is launched with a new *netlist* by **gsch2pcb**, the footprints will appear on the blank PCB. The footprints can then be spread out and the connections between them seen on the screen as a *rats-nest*. If *rats-nests* do not connect to a particular component as expected, it is likely that the footprint needs to be modified to match the pin numbering of the symbol used in the schematic editor *gschem*. As the design of the PCB progresses, each *rat-nest* is eventually replaced by tracks or a *pour* of copper. A *pour* of copper is larger area of continuous copper, a common example being a ground plane.

Useful advice from Jim Tregellas VK5TR is that tracks should be err on the side of wider, rather than narrower, widths to reduce the problem of "undercut" during etching of the copper layers, and to make the design more reliably manufacturable, particularly if toner transfer methods are being used at home. Furthermore, blank areas of PCB have to have copper etched away, increasing the environmental cost of PCB manufacture and the rate at which the PCB manufacturer has to replenish etchants. In short, leaving as much copper on the board as is compatible with the design is to be preferred.

A sensible strategy prior to making the board or sending off design files for manufacture or etching some copper at home is to print a copy of the board at 100% size on paper and make sure the components actually fit in the space available, and that the board will fit in your intended enclosure. It is cheaper to print a sheet of paper than to end up with a batch of boards that can't be fully populated or installed.

It should be noted that for simple designs with few interconnections between components, *PCB* can be launched and used in much the same way as a graphics program and used to simply draw a PCB design.

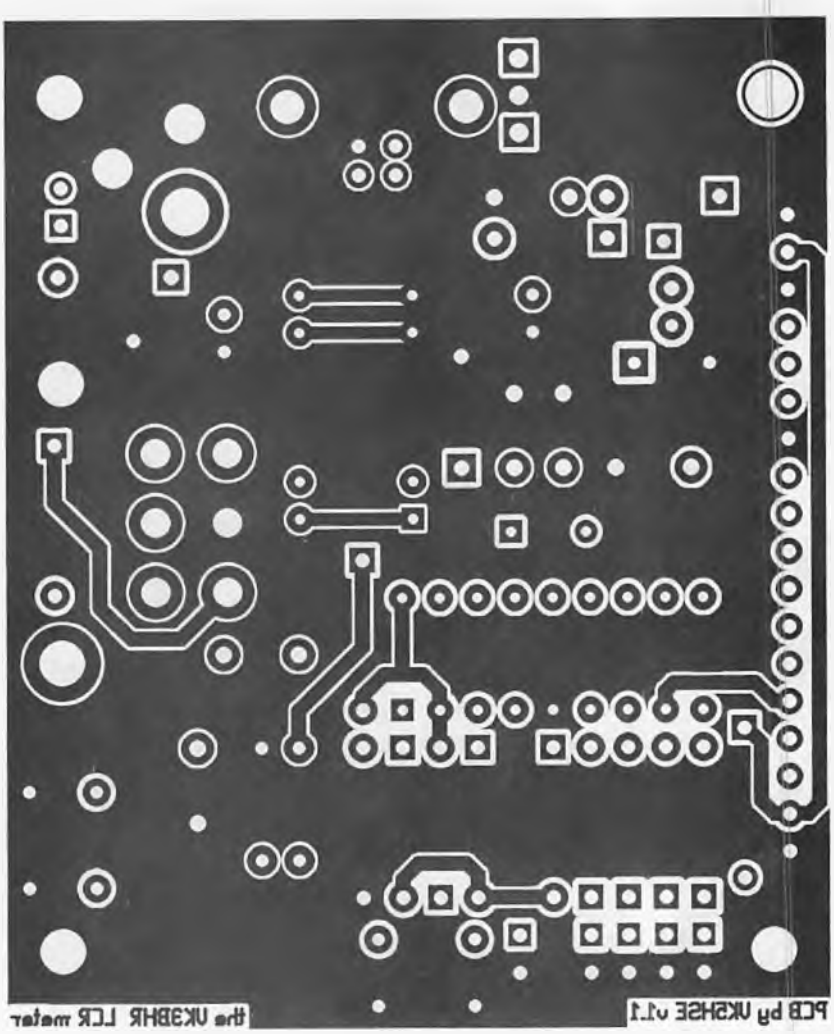


Figure 8: LC meter v1.1 bottom copper layer (600 dpi 56 mm x 69 mm).

This eliminates the need to create a schematic in *gschem* or use **gsch2pcb** entirely. The only downside of using PCB this way is that *PCB* cannot tell if you if you have failed to connect things properly, as it will have no *netlist* to work with. You should save your work often, so you do not lose your changes in the event of mishaps.

After the PCB for the LC meter was fairly complete, component values were added to the silkscreen, making the PCB self-documenting. The designed LC meter PCB accommodates the usual pin out of 16 pin LCD displays, and also the less common pin out of displays with backlight connections at the opposite end of the LCD pin out. Additions to the VK3BHR design included a USB connector and diodes allowing the unit to be powered either from a USB cable carrying 5 volts, or from the on board LM7805 voltage regulator and a DC barrel connector. A footprint was also provided for the capacitance-inductance switch, simplifying the wiring to the DPDT switch. Two 3.1 mm holes have been provided along one edge of the PCB to accommodate banana terminal posts. A version number should also be placed on the PCB so that you and the manufacturer are clear as to which version of the design files are to be used

for manufacture, especially if a revised design is being sent for manufacturing. You should also consider indicating the terms of the design licence on a silkscreen or copper layer. I usually use refer to the TAPR licence http://www.tapr.org.OHL on amateur radio related PCBs that I would like to remain freely available for use by amateurs wherever they may be.

Once the LC meter design was completed to my satisfaction in *PCB*, the design was exported as a set of *gerber* files for each layer of the PCB. A *gerber* file employs an industry standard format to describe a PCB layer for automated manufacture. The *gerber* files produced described each layer of the pCB design, namely, the top silkscreen, bottom silkscreen, top copper, bottom copper, top and bottom solder masks, and outline layer. Solder masks are used to protect the copper from oxidation and also to confine solder to the pads or pins of components, saving the PCB manufacturer money by minimizing the amount of lead-tin solder required to coat the PCB tracks. The silkscreen is the text printed over the solder mask, usually showing component outlines, component designators, and any other text or graphics the designer chooses to add.

Most PCB manufacturers can provide double sided PCBs with plated through holes (PTH). Sometimes holes are needed which do not require plating (NPTH), and these are defined in a separate *gerber* file containing NPTH descriptions. When generating *gerber* files for manufacturing, you will need to ensure that the file endings generated for each layer's *gerber* file is compatible with your board manufacturer's requirements. Failure to get this right may mean transposed layers, which in the case of multilayer boards may cause mysterious electrical behaviour or outright failure to work as intended.

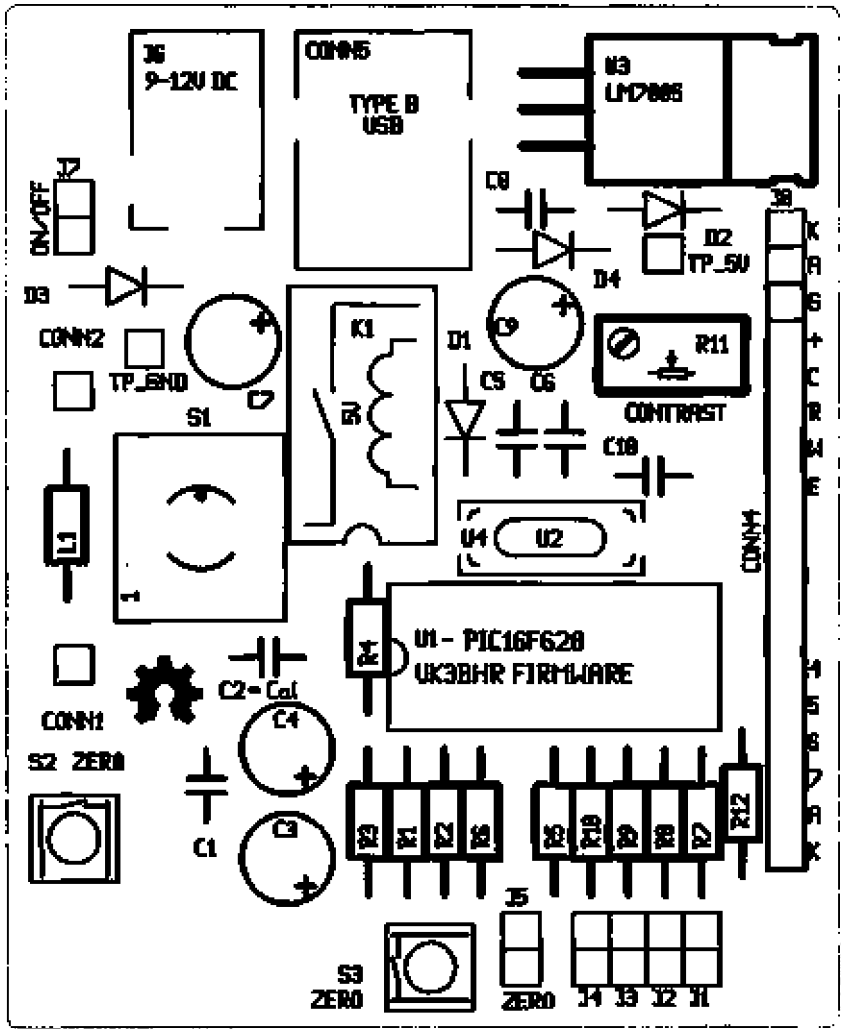
PCB design software can also export *gerber* files defining apertures in stencils for solder paste application for SMD components. These were not needed for this design which uses only through-hole components.

A sensible strategy when the design is complete is to view the gerber files in a suitable utility to ensure that there are no problems with the final rendering of the artwork in the *gerber* files. Suitable utilities include *gerbv*, which is bundled with the gEDA tool suite, or online gerber viewers, such as *http://gerblook.org*

Most PCB design software also allows each layer or a combination of layers to be exported as a graphic, such as portable network graphic (.PNG) or postscript formats (.EPS), for those who wish to try toner transfer PCB production at home. The software also supports image scaling to compensate for "stretching" of the image which can occur with any given printer.

The v1.0 *gerber* files were produced, compressed into a zip file and sent off for manufacture. The PCBs soon arrived and assembly was straightforward. The banana terminal posts were used to support the PCB in a surplus "Weathalert" receiver enclosure. The PCB also has four mounting holes, if required by constructors. The existing LCD in the "Weathalert" was connected to the PCB, along with wiring for the on/off switch, reset switch, and power connector. Happily, it

Figure 9: LC meter v1.1 top silkscreen layer (600 dpi 56 mm x 69 mm).



worked. The VK3BHR LC Meter has been quite useful in determining crystal filter parameters for crystal filter design. As always, there were improvement to be made to the v1.0 LC meter PCB, consisting of a better LCD contrast potentiometer footprint which necessitated some re-arrangement of components, a better L-C switch footprint, and more compact electrolytic footprints.

Version 1.1 PCB layouts have been published in this article.

Those wishing to use the LC meter PCB can download the design files and have PCBs made. I usually get PCBs made by hackvana.com, but the design files are industry standard and can be used by any PCB design house that accepts *gerber* files. Clubs or groups of amateurs will typically achieve significant savings if larger (i.e. 10 or more) numbers of PCBs are ordered. The LC meter PCB is licensed under the TAPR open hardware licence.

There is going to be a bit of a learning curve, no matter which package you choose to familiarise yourself with. As always, *Google* is your friend if you run into difficulties, but by far the most valuable sources of assistance are the IRC channels for gEDA and KiCad users. Before you even begin your first design, you should obtain a copy of the reference manual for gEDA and familiarise yourself with the keyboard shortcuts used within *gschem* and *PCB*.

What is IRC? Internet Relay Chat - the grand-daddy of ICQ, and instant messaging generally. Teaching you to use IRC is beyond the scope of this article, but there are good primers, ie. *http://www.irchelp.org/irchelp/ircprimer.html*

On the Freenode IRC server, the channels are: #kicad and #pcb, and on the OFTC IRC server, the channel is: #geda.

To access these IRC channels, you will need to install an IRC client, or use a web interface, i.e.

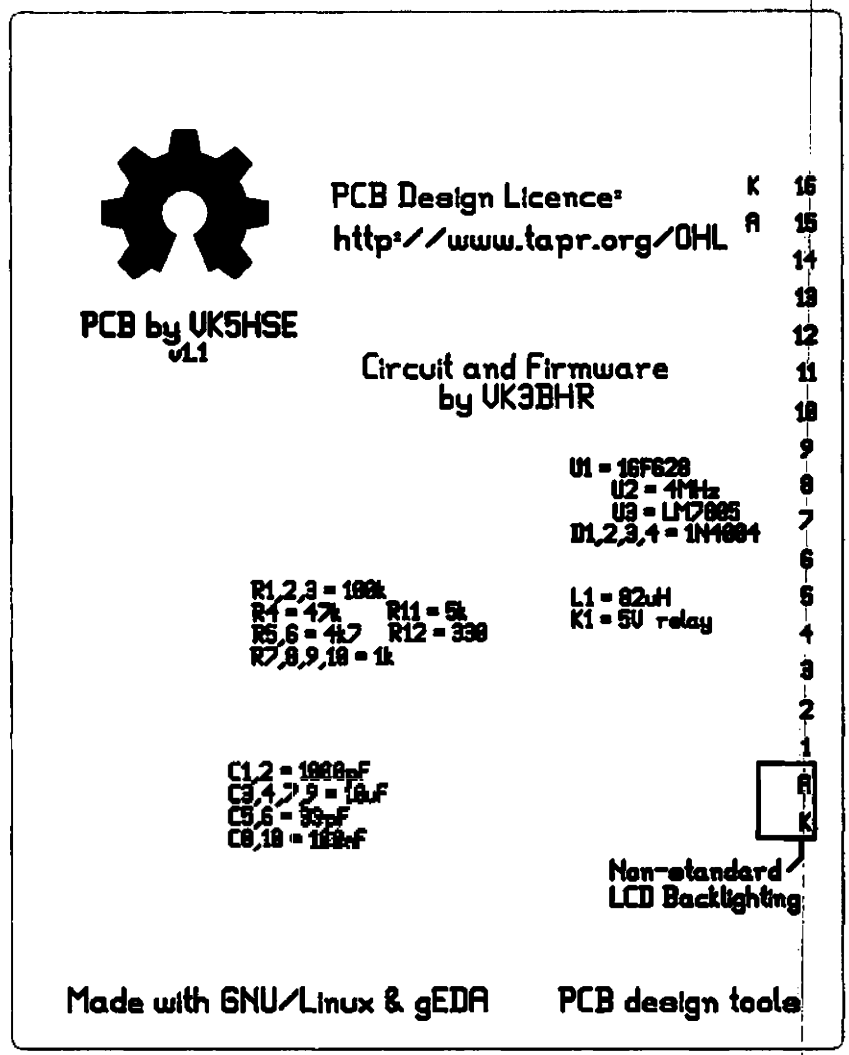


Figure 10: LC meter v1.1 bottom silkscreen layer (600 dpi 56 mm x 69 mm).

http://www.oftc.net/WebChat/

https://webchat.freenode.net/

It can't be stressed enough that you will learn a lot in these IRC channels just by keeping your IRC client open and reading the traffic that scrolls past.

More ambitious gEDA users can request CVS access to the gedasymbols symbol repository. CVS is a software tool used to maintain local copies of files undergoing ongoing development. CVS access allows a local copy of footprint collection to be made, and if you design new footprints or schematic symbols, contributions can then be made to the collection as well. Even more ambitious gEDA users can download the source for the gEDA suite and compile a copy locally, and even contribute to ongoing software development if keen.

So, in summary, a basic introduction to PCB design using free and open source software tools has been presented, focusing on the gEDA design suite. The admission cost is zero if you don't count the time you spend learning, and someone may even pay you to take their old PC on which you can then run Linux and free PCB design tools. Help is freely available whether you use gEDA or KiCad, via a supportive on-line community.

In closing, anyone contemplating an open hardware, collaborative or education targeted design project

should reflect on the fact that open source design software protects your investment of time and effort, and makes the project maximally accessible to your target market both now and into the future.

Those wishing to have a go at PCB design are encouraged to get a copy of the gEDA tool suite, or KiCad, and start playing. There are many web sites with introductory tutorials and guidance in using these design tools. I have made the LC meter *gschem* and *PCB* design files available as well for those who would like to experiment with the design. An older, hard waste collection grade PC, a free copy of Linux and free, open source PCB design tools are well within the reach of any amateur and certainly within the reach of a radio club, Scout group, hackerspace or school seeking to design their own PCBs.

References

https://sites.google.com/site/vk3bhr/home/index2-html

http://www.geda-project.org/

http://www.kicad-pcb.org/

http://www.tapr.org/OHL

http://creativecommons.org.au/learn/licences/

https://github.com/nocko/gEDA-template

http://gedasymbols.org

http://www.luciani.org/geda/pcb/pcb-footprint-list.html

http://www.gerblook.org/

http://wiki.geda-project.org/geda:pcb-quick_reference

http://pcb.geda-project.org/manual.html

http://www-mdp.eng.cam.ac.uk/web/CD/engapps/geda/starting_gEDA_long.pdf

http://www.brorson.com/gEDA/land_patterns_20070818.pdf

http://www.oftc.net/WebChat/

https://webchat.freenode.net/

http://www.irchelp.org/irchelp/ircprimer.html

http://github.com/erichVK5

Participate

Spring VHF/UHF Field Day 14 - 15 November

Keith Roget Memorial National Parks weekend 14 - 15 November

Disaster recovery helped by radio amateurs

Jim Linton VK3PC, Chairman IARU Region 3 Disaster Communications Committee

In many disasters, trained and prepared radio amateurs are able to help the recovery efforts. Unlike commercial services that rely on infrastructure, the radio amateur can be independent in terms of both communications and power.

There are continuing examples throughout the world where amateur radio has made a difference in the response. Some of those occasions are included on the IARU Region 3 website Disaster Communications archive.

"When all else fails – Amateur Radio" is a slogan for emergency communications, and another that sums it up: ***"Amateur Radio - A Trusted Partner in Emergency Response."***

Photo 1: Jayu Bhide VU2JAU of Gwalior, National Coordinator for Disaster Communication in India (ARSI).

Nepal's Earthquake Disaster

A major disaster occurred on the morning of April 25, 2015 when an earthquake measuring 7.8 hit Nepal and triggered an avalanche on Mount Everest. There were frequent aftershocks including a magnitude of 6.7 on April 26, and on May 12 another earthquake measured 7.3.

The loss of life has been variously reported at 8,000 people, with more than 19,000 injured. Old and heritage buildings were lost and villages reduced to rubble.

In the aftermath of the earthquake there was an almost immediate response to support the disaster relief efforts by Nepalese radio amateurs.

They were involved with local police and military for internal communications along with two international link stations 9N1AA and 9N1SP.

The first international contact was on the 20 m band between Satish 9N1AA a lawyer in Kathmandu and Jayu VU2JAU in India.

Satish, aware of a regular net on 14.210 MHz, made initial contact to provide information to the wider world and seek help. He was operating with low power from solar panels.

The net grew substantially, involving others, and a Facebook page was set up to monitor the 20 m frequencies in use. Other amateurs in Nepal helped with mostly hand-held radios giving local support.

Maintaining the international link was difficult given propagation changes through the day, but was achieved by a geographical spread of stations and use of a remote-controlled station. This was provided by Thor TF4M whose low-noise location and rhombic antenna helped significantly in keeping the net operating.

About the same time, an HF radio donated by an organisation called Radio Mala was used by Sanjeeb 9N1SP. With his crew, he sent photos of the affected areas and helped with the rescue efforts through radio amateurs around the world.

All either updated the crisis needs, worked to help responders or put people in touch with relatives in the absence of other communications. There were frequent requests from abroad to trace relatives and friends in the earthquake zone.

Although Nepal may at first appear unprepared, geophysicists and other experts had warned that Nepal was vulnerable to a deadly earthquake.

For five years Radio Mala had been increasing amateur radio's preparation for an earthquake, with that country having a major one in 1934. What made this earthquake so devastating was that it involved

populated areas and had frequent after-shocks.

The idea of Radio Mala goes to Suresh Ojha, born in Nepal, raised in the United States who became an amateur W6KTM, named after the Kathmandu airport code of KTM.

Mala in Nepalese means Garland - a ring of flowers people put on one another in Nepal during auspicious occasions.

On graduating from the University of California, he began teaching radio frequency and microwave engineering at Tribhuvan University in Nepal.

The likelihood of an earthquake worried him, and he was well known to emergency communicators and previously tested links and relationships that were brought into play.

He was a member of CAN-USA (Computer Association of Nepal-USA), and under Radio Mala it had help from the Institute of Engineering at Tribhuvan University, Bay-Net which runs repeaters in Silicon Valley, and the America Nepal Medical Foundation.

The years of effort to licence people, having a HF transceiver, some hand-held radios and a repeater system donated, contributed greatly in providing communications.

It had not been easy to grow amateur radio due to social and political reasons plus the low income level, but, from a mere five with licences in 2011, it expanded to an additional 78 callsigns.

Those with licences are mostly Kathmandu residents, and many students of Tribhuvan University where amateur radio is in the engineering curriculum.

The US-based Military Auxiliary Radio Service (MARS) had done a little pre-work testing links with Nepal in anticipation of an earthquake. MARS reported on its role at the GAREC 2014 *http://www.iaru.org/uploads/1/3/0/7/13073366/mars_garec_14_aug_2014.pptx*

There was an effective MARS link between Sanjeeb 9N1SP and Tim T6TM based in Afghanistan. This had been developed and exercised since 2012 through the Pacific Endeavour exercises that in 2014 simulated an earthquake in Nepal.

The MARS response concept is to get their stations around the world to listen for any emergency activity on or around the IARU Emergency Centre of Activity frequencies (see Table 1), to gather information to support the international disaster response.

Part of the MARS response at Kathmandu was Sanjeeb 9N1SP, an Associate Professor, from the Institute of Engineering at Kathmandu's Tribhuvan University.

When the earthquake struck, all radio amateurs came on air and began exchanging information. Soon they were helping in the disaster response.

During the earthquakes, frequent disaster reports were issued by Satish 9N1AA at Kathmandu, and Jayu VU2JAU. There is no IARU Member Society there but he and others from the Nepal Amateur Radio Operators' Society (NAROS) were very active.

The international disaster response with search and rescue teams, and humanitarian aid, had installed their own communications links. The amateur radio nets became less useful as time progressed, and eventually closed on May 17.

In closing the net, everyone who supported the Nepal disaster through this difficult time was thanked.

The event raised significant newspaper, radio and television coverage overseas on the role amateur radio can play in emergencies. This was done by interviewing key radio amateurs involved. Some groups have a spokesman or dedicated publicity officer.

Through the IARU, engagement of Satish 9N1AA has been possible, with the view of a closer working relationship with authorities and recognition of the role amateur radio can play.

Later, Satish 9N1AA chaired a meeting of the National Disaster Management Monitoring and Directive Special Committee.

It looked at making recommendations to the government after a thorough assessment of the loss of life and property, rescue and relief operation and re-settlement following the disaster.

After the earthquake Radio Mala has continued to send radios and repeaters. Through it and those who attended the Maker Faire Bay Area event at San Mateo California built wire dipoles destined for some remote areas.

Philippines disaster plan

Typhoon Haiyan (locally Yolanda) devastated the Philippines in November 2013. The Category-5 storm was one of *the strongest tropical cyclones* ever recorded, killing at least 6,300 people in that country alone.

It involved 100 radio amateurs initiated by Philippine Amateur Radio Association (PARA) and HERO (Amateur Emergency Radio Operations) networks. A presentation about PARA and this disaster and the role of the HERO network was made at the Global Amateur Radio Conference 2014: *http://www.iaru.org/uploads/1/3/0/7/13073366/iaru_r3_typhoon_presentation_garec-14.pptx*

What happens there in response to a pending disaster, PARA activates a National Traffic Service Net three times a day *(http://para.org.ph/nets/)* which provides a daily indication of who is available, and then ramps up to an emergency net if a disaster is declared. It also has been defined and recognised by the government in its message forms.

The Philippines has frequent severe weather events. PARA through its many affiliated clubs has been able to follow-up its actions and gained much greater recent

Photo 2: When an earthquake struck Sichuan in China; Liu Dan BD8ABM was among the radio amateurs who helped with emergency communications.

recognition by authorities who call for its expertise and resources.

Why amateur radio?

The range of frequencies and equipment available is vast, and can get the message through. In some places radio amateurs involved in emergency communications explore technology, by using weak signal digital or text modes. Responders have benefitted from real time vision from disaster scenes.

Many of the field days were originally inspired to prepare radio amateurs for emergencies – a fact not known by many contesters today.

Some others use radio communication to give safety and logistics at community events as they practice and train in message handling and other skills.

The disasters can be natural events, appearing to be more frequent and lasting longer, may be influenced by climate change.

The calamities may extend to man-made emergencies like power outages, a major utility or infrastructure failure.

Whatever the cause, normal communications are cut or overloaded. Being prepared, organised and trained in joint operations with first responders is vital, to understand their needs, foster awareness and understanding, or facilitate any interoperability.

The availability of frequencies, equipment and know-how to get the message through can be a real asset. Despite the development of very complex systems - or maybe because they are so complex - amateur radio has been called into action to provide communications.

"When all else fails – Amateur Radio" is a slogan for emergency communications, and another that sums it up: ***"Amateur Radio - A Trusted Partner in Emergency Response."***

ITU and IARU recognition

The United Nation's agency, the International Telecommunications Union (ITU), has long recognised Amateur Radio as a recreation, a means of self-education and that radio amateurs can provide emergency communications.

Formal recognition came at the ITU World Radio communications Conference 2003, when Article 25 was reviewed, a new provision, Article 25.9A was inserted, saying: "Administrations are encouraged to take the necessary steps to allow amateur stations to prepare for and meet communication needs in support of disaster relief."

The International Amateur Radio Union (IARU) also actively supports this disaster capacity, through its discussions including those to protect and enhance our bands.

It has promoted emergency communications provided by radio amateurs at numerous disaster forums and takes whatever appropriate opportunity exists to raise the issue.

A recent example has been the multi-lingual expert display to show the diverse ways amateur radio can serve in an emergency situation, at the International Telecommunications Union World Radio Conference 2015 in Geneva, Switzerland.

It has also produced a brochure and guide on emergencies which can be downloaded at:

http://www.iaru.org/uploads/1/3/0/7/13073366/iaruemergencybrochure.pdf

http://www.iaru.org/emergency-telecommunications-guide.html

Approaches meet the challenge

On each occasion the response has been diverse and radio amateurs able to adapt to meet the needs of served agencies.

One of those differences was where they were asked to provide a link for relatives of passengers on board the missing Malaysia Airlines flight MH370. A report can be read at: *http://iaru-r3.org/missing-flight-search-involves-amateur-radio-emcomm/*

Amateur radio does not have to pass 'life or death' messages, but instead can find roles in either providing a 'direct line' for specific users, or taking the communications load off the main emergency services networks.

Some adaptable radio amateurs

find themselves in other important counter-disaster work, and by using the radios or systems deployed by responding agencies or humanitarian organisations.

For example, in parts of Australia the Wireless Institute Civil Emergency Network (WICEN) has trained in the use of fire service radio systems, while in another area, work in support of a veterinary group to provide radios and infrastructure to help wildlife injured during bushfires.

The role of willing communications volunteers can add skills and knowledge to any organisation. The diversity of disasters encountered by radio amateurs in the past decade are archived at: *http://iaru-r3.org/category/disaster-communications/*

Being on the spot radio amateurs provide the flow of early communications in the first 24-48 hours to help authorities, disaster responders and the NGO sector. Some of them may be embedded with other groups in a disaster, but play an important role.

There are necessary rules and procedures in any disaster, knowing these are part of fitting in with others. An important and rewarding role in support exists for the radio amateur serving alongside the many other volunteers.

There are also a number of examples where radio amateurs have official recognition to join organised emergency drills, often alongside other responders. The agencies decide how to respond to a given incident or set of circumstances - in other words set a scenario.

These events can include the national, regional and local governments who take seriously disaster mitigation and preparedness.

The Pacific has 16 nations which met in Sydney Australia in August 2015 to review their disaster mitigation and responses. However the area has very few radio amateurs, presenting a real challenge.

CoA Emergency Frequencies

News of a disaster involving radio amateurs is quickly promoted in online amateur news and websites to raise awareness of the activity.

Those not in a disaster should avoid interference to emergency communications on the bands. The system of 'Centre of Activity' or CoA frequencies (Table 1) is designed as a guide, and is reflected in most bands plans and callbooks.

These have been adopted by each IARU region to be a focus for emergency communications. They are not 'absolute' frequencies, but emergency traffic may be found ±20 kHz from them.

Some countries also maintain other emergency frequencies due to local requirements. No-one has a claim on a frequency, but it is hoped that with the CoA and other publicised frequencies the radio amateur engaged in an emergency is recognised and given some consideration.

Region 1	Region 2	Region 3
3760	3750 or 3895	3600
7110	7060, 7240 or 7290	7110
14300	14300	14300
18160	18160	18160
21360	21360	21360

Table 1: Centre of Activity Frequencies (in kHz) by IARU Region.

Early amateur radio in Nepal

Reference to Nepal would not be complete without a brief mention of a pioneer and the only contact for many with that tiny DX country, Fr Marshall Moran 9N1MM SK).

He was the Jesuit Priest that brought the Christian belief to the Hindu Kingdom, and the Chicago USA born also promoted amateur radio to the world.

The DX-entity made 9N1MM 'Nine N One Mickey Mouse' much sought after. It was his friendly style on air that made the contact even more prized.

In 1951, after being transferred from India and he became the very first amateur radio operator in Nepal, spending 40 years there as a teacher.

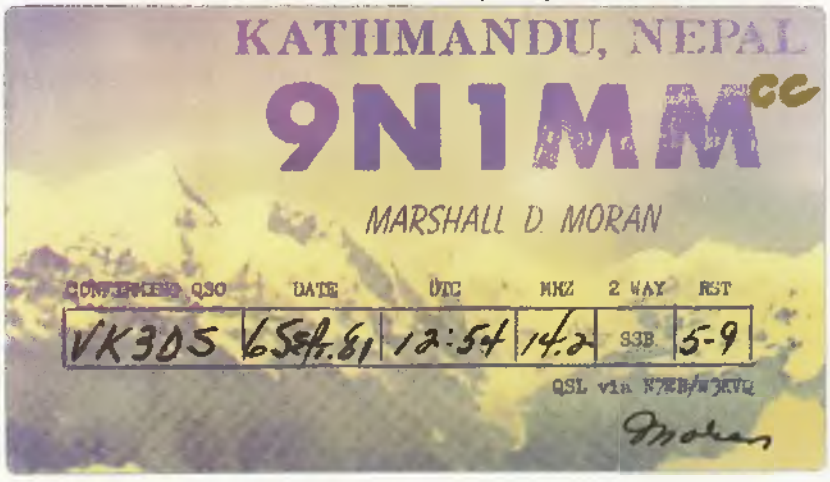
He also set-up emergency communications including rescue work during an earthquake and flooding, and saving Mt Everest climbers.

For that work, Fr Moran received a Royal recognition from King Birendra of Nepal, and the International Humanitarian Award of the American Radio Relay League.

He was hospitalised in Kathmandu in April 1992. There he was diagnosed with leukaemia, and died on April 14, 1992, soon after being transferred to New Delhi, India for advanced treatment.

The sad passing of Fr Marshall Moran 9N1MM, aged 86, was recorded in amateur radio magazines throughout the world.

Photo 3: The WIA historical QSL card collection proudly includes this 9M1MM card.



A 7 MHz wind up transmitter: not just for cranks

Peter Parker VK3YE

Photo 1: Outside.

A cheap wind up LED torch in a discount store got me thinking about using its generator to run a low power transmitter. Or even having the whole transmitter inside the case.

It didn't start off promising. The torch was bright enough but the button battery (labelled CR2032) didn't hold much charge. And, knowing the low current LEDs draw, I was worried that the generator would be too small.

Things looked brighter when the generator was disconnected and its voltage output measured. It was over 16 volts with fast winding and no load resistor. Various parallel load resistors, ranging from several hundred down to about ten ohms, were then tried to simulate powering a transmitter. If the voltage dramatically fell across even a fairly high resistance we'd know that its output would be insufficient for anything but the lowest drain item.

Furious cranking provided an encouragingly healthy voltage, even with low value resistors. Ohm's law gave the current from the known voltage and resistor values. Multiplying this with voltage allows power, the real measure of the generator's capability, to be calculated. This was more than enough, as also proved by the smell of charred load resistor.

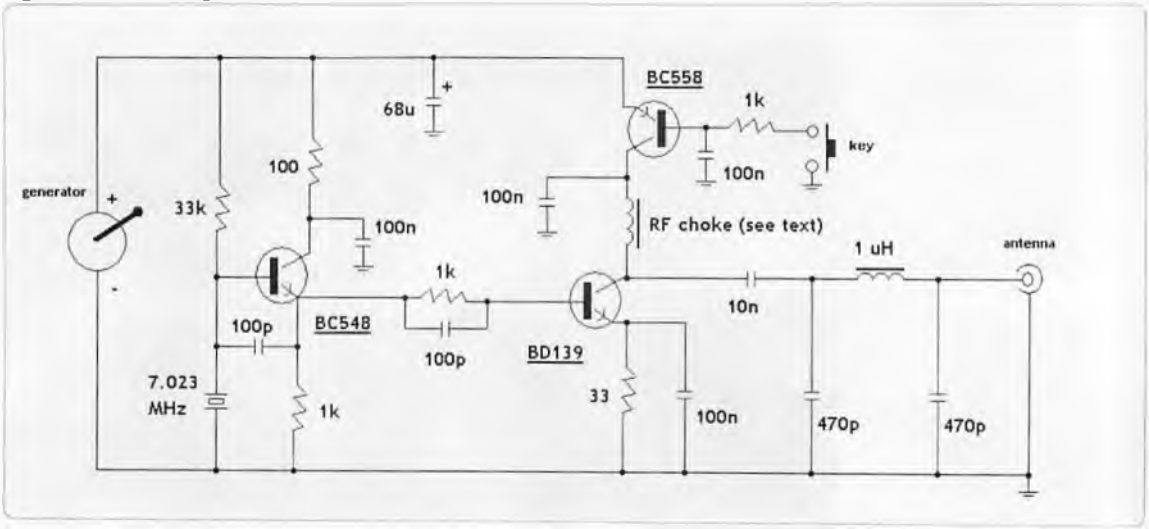
Burning components are likely hazardous if inhaled and will not make you popular should these tests be performed inside. Still, it's always more reassuring when electricity's force is demonstrated by movement, light, heat or smell rather than flickering digits on a liquid crystal display.

Before the smoke escaped, cranking gave 7 volts across a 12 ohm resistor. That's over half an amp or 6 watts. The cranking rate couldn't be sustained and would probably soon break the handle even if it could. Still, leisurely and sustainable winding gave 1 to 2 watts, which is sufficient to run small projects.

A test with a milliwatt VHF 'low interference potential device' beacon, with a previously measured range of 5 km, was successful. Cranking was easy due to the low current drain. The only downfall, which could be beneficial if receiving on an AM-only set, was the loud alternator whine impressed on the transmitted CW signal. A 100 uF capacitor across the generator soon largely fixed that.

With prior doubts quelled, thought turned to building an HF CW transmitter inside the torch. Removing the battery, LEDs and circuit board freed some space.

Figure 1: Circuit diagram.



There wasn't much clearance but the few parts needed could be bent over against the board.

Which band? Past tests on 7 MHz, where 500 km was spanned with 20 milliwatts, demonstrated its suitability. And ten metres of wire as an antenna is a far cry from the hundreds of feet, often supported by kites or balloons, required by lower frequency predecessors such as the 500 kHz WWII 'Gibson Girl' emergency beacon. An on-hand 7.023 MHz crystal clinched the deal, though other frequencies such as 7.015, 7.030, 7.040, 7.122 or 7.159 MHz are also suitable. Go for one of the lower ones if using this transmitter for random CW contacts or a higher one if crossmode CW/SSB operation is envisaged.

Circuit description and construction

Several QRP transmitter circuits were considered but the 30-year old OXO by GM3OXX won out. It uses three common transistors and few other parts. Previous builds had worked first time. Unlike some IC designs, it will work with a wide range of voltages, which is needed given the varying supply.

Figure 1 shows the circuit. The crystal oscillator, which runs whenever the handle is cranked, drives a power amplifier stage. This comes alive whenever pressing the key causes the PNP keying transistor to switch on. A low pass pi network filter on the power amplifier output attenuates harmonics.

Jaycar stocks all parts except for the 7 MHz crystal which is cheaply available on eBay. 80 metres, possibly with a cheap 3.58 MHz crystal, should also be possible if the pi network values are doubled. This band has less overseas interference at night but its high absorption and longer antenna requirements make it generally less suitable during the day unless sunspot numbers are low.

None of the component values are critical, except for the pi-network RF output filter. Its coil is a 1 uH RF choke, though the equivalent could be wound on an iron powder toroid. The only other inductor is in the collector circuit of the power amplifier stage. It's just wire wound through a 6-hole ferrite bead often found in VHF transceivers. Almost any RF choke or few turns of wire through a ferrite such as from a TV antenna balun should work as a substitute.

All parts were mounted on a piece of plain perforated matrix board screwed where the torch's board used to be. It's approximately 3 x 6 cm, and, as mentioned before, components are mounted flat against the board, even if their leads need to be bent. Keep soldered joints only just thick enough to ensure reliable connections if there is limited clearance underneath. No heatsink is needed for the BD139 due to the lower than rated output power and the on-off keying.

The key is a push-button momentary switch salvaged from the front panel of a video recorder or similar. Mount it where it's easy to press while cranking with the other hand. Mine went on the front LED part of the torch. Solder insulated wire to the switch's pins, drill two holes to line up with them, glue the switch to the torch and leave overnight.

Testing and using

With a 7 MHz receiver nearby apply power from a 12 volt battery and listen for a carrier from the crystal oscillator. Pressing the key should result in a much stronger signal as the power amplifier transistor is now operating. Measure the output with an RF power meter. Around 1 watt is usual.

Satisfied that the transmitter is operating on a normal power source, try running it off the generator. Find which direction you prefer to crank the handle (I prefer clockwise with the right hand) and connect the generator's polarity to suit.

Measure the transmit output power again. Expect a few hundred milliwatts with moderate cranking. Listen to the note on a nearby receiver. It should be clean though possibly with a slight change in sympathy with cranking speed. This occurs due to the lack of voltage regulation to the crystal oscillator.

Connect a single pole double throw switch in the antenna line (not shown in the circuit) to change between transmitter and receiver.

It's easiest if the receiver has its own power source, though this detracts from the 100% hand-powered idea. Using the crank generator to power a receiver hasn't been tried but noise on its supply rail could be difficult to suppress. A small battery or large capacitor topped up by the generator (when transmitting) may be a solution.

Practical CW transmitters capable of routine random contacts require frequency agility and at least 1 or 2 watts output. While the single frequency and low power places this one in the novelty class it is by no means a useless project. And

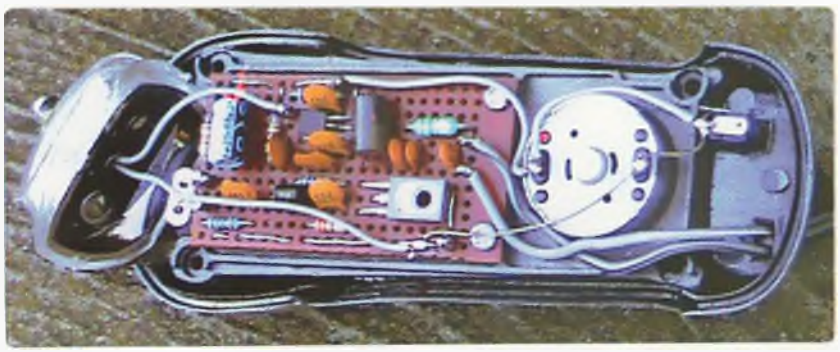


Photo 2: Inside.

the contacts you do get - few, terse and imperfect they may be - will be remembered, both by you and those worked.

Alternative uses include as a bush hiking beacon (especially if you've arranged for others to listen) and human foxhunts. Extras like a PIC-controlled beacon ID or GPS to transmit your position could be worth considering but require ingenuity to fit inside the case and not draw too much power.

Human power challenges sedentary living and brings intellectual benefits. It revives the nexus between physical effort and results that labour specialisation, domesticated animals, engines and electricity broke. A reminder of this encourages us to reappraise the worth of what we get for what we use and reconsider what is really important.

Visit *youtube.com/vk3ye* for a video description of this unit.

Over to you

Mr Phil Wait
President, WIA.

I read with interest that the WIA wants to know why people do not join the WIA or do not renew their membership. I would like to submit my thoughts on the issue.

First of all we must ask ourselves why do people not want to join our hobby and equally the WIA , yes we have a continued stream joining in small numbers, but not in the numbers we need to remain viable. Let us look at the possible reasons.

1. Difficulty (passing exams)
2. Expensive (Cost of exams, licences, equipment)
3. Old fashion (old men with old ideas, old technology)
4. Competing technology (Skype, mobile phones.)

Difficulty

A few years ago the WIA asked the question "Foundation licence where to from here?" Then nothing, it looks and sounds like someone asks a question and does not like the answers so nothing is done. For the F call what has improved since its introduction? Little or nothing. The standard answer is study and upgrade (more time and expense). The questions on the exams seem to be more at catching you out rather than making it easy for you to pass. My brother who would love to be into radio and I have encouraged him to do so, says and I quote ***"You must be joking; it's a hobby and I need to pass all those exams to join – no way"*** He also says to me that if he wants to play around with radios, he can repair them, he can build one, he can do anything I can do accept go on air and operate them and you cannot argue with that.

I have spoken to the ACMA about a few things, open book exams, online testing and the following is part of what they have told me.

Under section 122 of the Act, ACMA can issue a Certificate of Proficiency if, amongst other things, ACMA is satisfied that the applicant has achieved or would probably achieve satisfactory results in examinations conducted by a body or organisation approved by ACMA.

Based on the above, why won't the WIA seek to adopt an open book type examination? After all if you do not know an answer, is it not best that you at least know where to find it? Another idea would be if someone enrols in the Radio & Electronics School and completes the twelve month course, then that should be seen as a commitment to the hobby and be recognised prior learning and a certificate of proficiency issued.

So I would suggest that the WIA first look at the question bank for all classes of licence and make them reasonable and easy: getting someone who knows electronics backwards, I would suggest, is not the best person to be selecting the questions because what is easy to him would not be easy to someone with no electronics experience.

I have been told ***"oh, the old timers would not like that, they had to do it the hard way"*** and that's fine but it is also rubbish and it is not a reason not to change. Numbers are decreasing the WIA have less than a third of amateurs enrolled so you need to change and change now, over haul the question bank, get more people into the ranks. Consider an open book type examination, then a possible online examination system. Look for ways to get more people in not hold them out.

Expensive

With equipment, this is not an easy one but one suggestion would be to have a Buy, Swap and Sell on the WIA web site for amateurs only, VK Ham have one. eBay sell a lot of equipment, why not the WIA? This could also be a small revenue stream. People are always looking for equipment.

The WIA should try and move to an online examination testing where someone can go online, pay an examination fee, have a set time and a set number of questions to pass their level be it Foundation, Standard or Advanced: not difficult to do and would be game changer. If they pass, they pay online for their licence and the WIA once it has been verified issue their call sign this could also be a small income stream. *(Ed: Clearly the author is not clear on the details of the recent changes to processing arrangements for licence fees and is totally incorrect regarding the issuing of licences: licences have always been issued by the ACMA, whereas the WIA does issue Certificates of Proficency.)*

With the yearly licence fee, not much can be done here other than lobby the ACMA for a better deal.

Old Fashion

If we are to remain a viable hobby, the old thinking must change. Fresh new ideas must be considered and developed, not discarded, whether we like it or not this is a numbers game: if the numbers fall too far, the WIA becomes unviable and irrelevant it will cease to speak for the vast majority of amateurs (and we are close to this now).

The WIA has canvassed members on some issues but nothing seems to be completed. The WIA must act upon some of the issues it has surveyed and received good feedback on, not just forget about them: I know myself that I have completed surveys and sent emails on issues and I am not sure what if anything ever came of the suggestions.

The people of the WIA, from the President to the QSL managers, are all volunteers and do an exceptional job. They are to be applauded and congratulated on the job they do and the time they give up, I cannot speak more highly of these dedicated people. The time for change is now not when the system has collapsed and no one is interested.

I ask myself will I renew my membership this year and I look for the reasons why I should:

I get *AR* magazine,

I support amateur radio in Australia,

I get access to Information.

Is it good value for money? I think it is but only just and I will continue to renew, but I do believe things must change and change quickly. I fully expect this letter to be read and a reply sent and that will be that, but I urge you not to do this, consider my suggestions, explore them further, expand on them, improve them. But do something.

Rob Cummins VK3NBC

SOTA & Park News

Allen Harvie VK3HRA

Photo 1: VK1NAM on Mt Gingera VK1/AC-002.

There are two new VK SOTA Mountain Goats to report. They have quite different approaches to SOTA. This demonstrates that whilst SOTA has the key components of the use of amateur radio from defined peaks, what people put into and what they get out of SOTA is very different.

Both started activating in February 2013 and achieved the magic 1000 points required for SOTA Mountain Goat this September.

Rik VK3EQ has been working the alpine summits trekking and skiing to the higher peaks. In a single week running up to Goathood, Rik VK3EQ notched up seven activations yielding 69 points bringing his total to 986. Rik then returned to the hills to finish up with 141 summits for the 1000 points for SOTA Mountain Goat.

Andrew VK1NAM is VK1's first Mountain Goat and our most prolific activator with over 360 activations to his credit. Andrew can often be found of an evening on a summit chasing DX or on the weekends out positioning himself for Summit to Summit contacts. With over 1035 S2S contact to his name, Andrew is in the top 10 for the world. It's a rare activation these days when I don't make at least one S2S with VK1NAM.

Congratulations to both Rik VK3EQ and Andrew VK1NAM for their efforts.

Paul VK5PAS has added an additional seven new VKFF references for the ACT:

- Bimberi Wilderness Area VKFF-0983
- Bullen Range Nature Reserve VKFF-0984
- Gigerline Nature Reserve VKFF-0985
- Stony Creek Nature Reserve VKFF-0986
- Swamp Creek Nature Reserve VKFF-0987
- Woodstock Nature Reserve VKFF-0988
- Tidbinbilla Nature Reserve VKFF-0989.

These reserves contain seven SOTA peaks, so there is something for everyone.

We are fast approaching 1,000 listed VKFF reference areas. This has forced those who support the WWFF program to add a leading zero to all the VKFF reference areas. VKFF-767 now becomes VKFF-0767.

SOTA is as busy as ever. Whilst the weather improved, band conditions did not. This has led to longer times on summits to qualify on 40 m during the day and the increased use of 2 m where suitable to secure the required contacts.

There are 4,844 VK summits in total and only 919 are listed as activated. So there are 3,925 to still do. There is still plenty of scope for activators to get out there and bag themselves a first activation.

Overseas activations by VK amateurs (or Andrews Abroad)

Andrew VK3ARR as ZS6/VK3ARR successfully activated two South African summits: ZS/GP-001 and ZS/WC-070.

Andrew VK3JBL, as E51AGN, successfully activated E5/RA-002 and SOTA got a mention on the evening TV news thanks to Andy E50A, the Association Manager.

https://vk3jbl.wordpress.com/2015/09/30/te-kou-e5ra-002/

Local activity

Gerard VK2IO spent 13 days in the Snowy Mountains area activating 20 SOTA summits and six WWFF activations.

https://vk2io.wordpress.com/2015/08/25/mt-perisher-activation-22-aug-2015/

There was a frenzy of activity in the last week of September and first week of October as the bonus period was closing. Those who could access the higher peaks in the improved weather went out to secure the extra three points. So the last weekend of September saw 150 activations over 12 WWFF references and 34 summits.

During this weekend Tony VK3CAT was activating his annual loop through VK3/VC and VK3/VT summits near Matlock. At the same time, VK3PF was activating in the same area, having started the day on Mt Tooronga Range VK3/VT-026. Peter was basically following Tony, thus providing both operators with additional summit to summit opportunities. After Peter had activated Mt Selma and Tony Connors Plain, Peter decided to abort an attempt on Connors Plain. They decided to head to a common summit Mt Useful for the end of the day. Along the way, Peter heard a pop from the front of the car after hitting yet another pothole. The end result was LOTS of smoke.

Fortunately Tony VK3CAT was 10 minutes behind, so Peter was not alone. Peter had retrieved all equipment that was readily accessible from the car before Tony arrived. A fire extinguisher was deployed in vain.

Photo 2: The Subaru about five minutes after stopping.

As the phone system did not cover this part of the area, it again came down to 40 m to get the message through. Between Tony VK3CAT, Johnno VK3FMPB and Col VK3LED, the CFA was informed and the location communicated.

By the time the CFA had arrived, Peter's equipment was in Tony's car: the fire had rapidly taken hold, destroying the Subaru Forester in very short order.

A big word out to all involved: Calm heads prevailed in what could have been a dark day for SOTA. Peter and Tony communicated between each other and then with the outside world. Both stayed safe and raised the alarm with the emergency services. Whilst it took some time for the CFA crew to arrive, that was understandable given the location. Tony willingly gave assistance and offered to give Peter a lift home.

Activating a summit on the drive out was the mark of true dedication! The exit route from the incident passed very close to Mt Useful. A fly on the wall (or window) reports that as the pair (VK3PF & VK3CAT) were approaching Mt Useful VK3/VT-016, the conversation turned to activating one more summit:

Well they looked at each other and said: "Why not!" "Single station" said Peter. "I'll set up the KX3, you do a spot QRV in 5" – Tony. "We can do 80 m if needed, what do you think, Peter?" "I'll do the spot for 40 metres. CW Tony?" "No just 7.090 and get things done quickly." Peter "want to work each other on 2 metres either side of the activation zone boundary?" Tony "But of course!"

They did rule out VK3/VT-034 however: apparently there was too much fog and you have to draw a line somewhere. Again glad that Peter got out safely. Ten out of ten for style for going on and activating another one on the way home though. Read details on:

https://vk3pf.wordpress.com/2015/09/26/an-unpleasant-surprise-during-a-day-of-sota/

And follow the link to Tony's blog for his account of the events.

Upcoming events

Note that changes to the start time for second period of the SOTA 6/10 m Challenge now makes it possible to contact field and home stations operating in the VHF/UHF Field Day on 14/15 November to participate.

KRMNPA Weekend – 13-16th November 2015. *https://au.groups.yahoo.com/neo/groups/krmnpa/info*

ARV is again coordinating this annual event. See the ARV column for additional details. Activators should register with Tony VK3VTH to be eligible for participation certificates.

WWFF Weekend – 28-29th November 2015.

So far there are nine activators who will be activating a total of 19 VKFF parks across Australia activated (VK3, VK4, VK5, VK6, VK8).

PLEASE: If you do intend to activate a park, drop Paul VK5PAS an email. He is keeping a spreadsheet of all intended park activations on the weekend.

https://au.groups.yahoo.com/neo/groups/wwffaustralia/info

The ANZAC Hostel Receiver

Jim Linton VK3PC

Many radio amateurs contributed their skills directly during WWI and WWII, but here we can see that members of the Wireless Institute of Australia applied their knowledge, time and skills to help others less fortunate than themselves.

At a time when radio broadcasting was relatively new, ANZAC casualties recovering in a nursing hostel were given a new state-of-the-art wireless set so they could listen in and enjoy.

The supply and installation of this 28 position wireless listening network was no mean feat in 1925!

The WIA Victorian Division, with money raised from its various sections, donated a broadcast receiver to the ANZAC Hostel located at Brighton in bayside Melbourne.

Radio Broadcast magazine (1) reported: "No detail has been neglected in the endeavour to give the inmates of the hostel the best possible service from the receiver, and the wiring to the 28 points in the building and the apparatus in general is of the best design, material and manufacture possible."

The fundraising included a card night of more than 350 players, and a wireless equipped car that attended concerts, picture nights, and various radio demonstrations, that also gained considerable public support.

The total raised was 219-pounds, 19-shillings and 3-pence, ($16,864 value today, according to the on-line RBA Inflation Calculator) – an enormous amount which was needed for the installation. The WIA Victorian Division presented the "handsome 6-valve receiver" together with its wiring, headphones and associated parts, including the erection of an aerial that had an 80-foot flag mast to hold up one end.

Photo 1: The ANZAC HOSTEL in Brighton, Victoria. Note the Aerial mast in foreground.

The Repatriation Department opened ANZAC Hostels in capital cities. In July 1919 it opened one in Brighton to care for severely incapacitated soldiers.

The 40-room mansion 'Kamesburgh' had seven nurses and an occupational therapy centre. Gardeners looked after the property's grounds. After 1945 it took many WWII veterans before being closed in June 1995.

Most in the ANZAC Hostel had severe physical and mental injuries. Some received constant visits from their family.

In the book *'Shattered ANZACs: Living with the Scars of War'* by Dr Marina Larsson (2), were detailed the multiple impacts caused by war injuries. It claimed that in WW1 Australia had 324,000 soldiers, 60,000 of them died in battle and 90,000 came back with war disabilities to end up on a pension. Many of the disabled died from their injuries in the years after the war.

Dr Larsson said: *"If a son or*

husband returned bedridden or paralysed or seriously shell shocked, the full pension was only 70% of the basic wage."

"And most soldiers weren't eligible for the full pension. Most got a 20% pension or a 50% pension, they then couldn't supplement that with work. It meant that the financial well-being of their entire family suffered and so, too, did the quality of their lives."

How families coped depended on the type of disability, and family members who could help with them having the emotional resources. The WIA and its supporters helped in a small way during time spent by returned servicemen at the ANZAC Hostel.

All photographs from *Radio Broadcast* magazine (edited by Ross Hull) April 1st 1925.

References

1. Radio Broadcast, April 1, 1925 - pictures p3, story p14. (WIA Archive).
2. 'Shattered ANZACs: Living with the Scars of War', published by the University of New South Wales, author Dr Marina Larsson.

Photo 2: The "WIA Receiver".

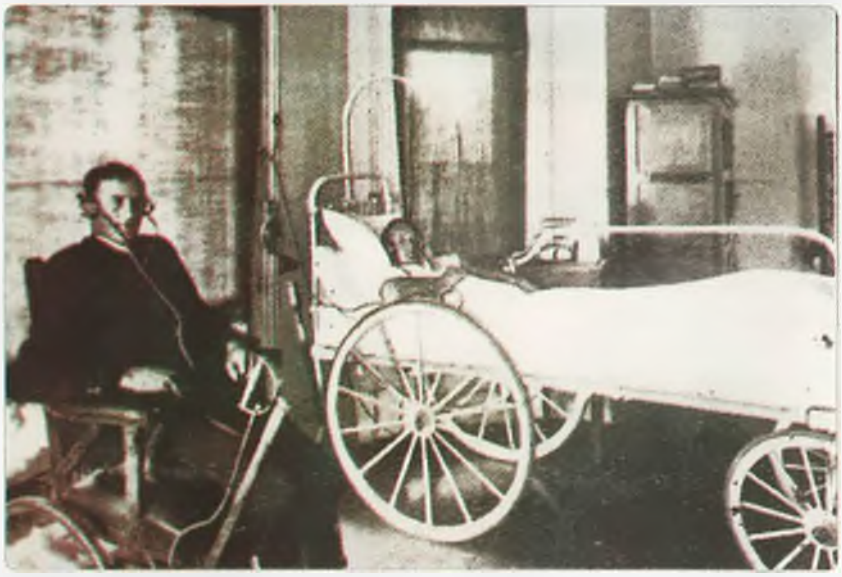


Photo 3: Two residents listening to a radio broadcast.

Contributions to Amateur Radio

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

Manuscripts with drawings and/or photos are welcome and will be considered for publication.

Articles attached to email are especially welcome. The WIA cannot be responsible for loss or damage to any material. Information on house style is available from the Editor.

Contests

James Fleming VK4TJF
vk4tjf@wia.org.au

Contest Calendar for November 2015 - December 2015

Month	Date	Starts at	Spans	Name	Mode
November	7th – 8th	1200 UTC	24 hours	Ukrainian DX contest	CW/SSB
	14th - 15th	0000 UTC	48 hours	WAE DX contest	RTTY
	14th - 15th	**0100 UTC**	**24 hours**	**Spring VHF/UHF Field Day**	**CW/SSB**
	28th - 29th	0000 UTC	48 hours	CQ WW DX contest	CW
December	6th	0000 UTC	24 hours	Ten-metre RTTY contest	RTTY
	12th - 13th	0000 UTC	48 hours	ARRL 10 metre contest	CW/SSB
	19th	0000 UTC	24 hours	OK DX RTTY contest	RTTY
	19th - 20th	1400 UTC	24 hours	Croatian CW contest	CW
	19th	0000 UTC	24 hours	RAC Winter contest	CW/SSB

Rules for most international contests may be found at *www.hornucopia.com* courtesy of WA7BNM.

There are two contests this month that should be both fun and easy to work.

For those who like phone there is the **JIDX**. Propagation to Japan is always pretty consistent, even for the amateur who is just starting out with a dipole. There are many operators in Japan needing your contact. This is a great contest to get your feet wet as many Japanese amateurs are quality operators. I'm also certain that by the end of the contest one could most likely achieve the Japan All Districts Award which is a very nice one.

The Japan International DX contest starts on 14th November 2013 0700 UTC and goes to 15th November 1300 UTC, so a total of 30 hours.

This contest is strictly phone.

Bands are the usual suspects 3.5/7/14/21/28 MHz. Categories are single operator high power over 100 watts or low power 100 watts, and all band or single band, or multi-op with all band high power. You can use the DX summit and other spotting networks, just no self-spotting.

Exchange will be RS plus CQ zone number and in return the JA station will supply RS and prefecture number. Only contacts with JA are worth points – 2 points for 28 and 3.5 MHz and the rest of the bands are worth one point. Multipliers are the different Japanese prefectures. Email your log at *ph@jidx.org* in Cabrillo format. Certificates this year will be in pdf files, so that you can download them and print it off yourself.

Most amateurs at my club will say that you can always find a Japanese station on the bands and that they are very common, I say let that be to your advantage and work a few for this contest.

The next contest is the **CQ WW Contest CW**, a great contest to help you increase your CW speed and skill. There will be no shortage of very good CW operators on the bands that want your country multiplier and will work hard to get it. Because it is CW, lower power is needed to make contacts. Most operators can make contacts below the noise floor. This is also a great way to increase your DXCC count.

This is another excellent contest for you In November. The CW WW DX Contest CW offers some nice things for those who do things the classic way without computers and for those that like to QRP.

So without further ado the goal is to work as many other amateurs in other zones and countries.

Bands are 1.8, 3.5, 7, 14, 21, and 28.

Exchange is the RST plus the CQ zone number. You get 3 points for working a station on a different continent, and 1 point for contact with countries on the same continent. The multipliers are the different zones and countries.

You can do single operator high-power 1500 watts, low power 100 watts, or QRP 5 watts, assisted or Rookie or classic. Rookie if you have been licensed less than three years before the start of the contest. And classic you can only use one radio, no QSO alerting assistance, only operate 24 of the 48 hours, and if you take a break it has to be at least an hour. There is also multi-operator one, two, or multi transmitter.

The dates are November 28-29, starts 0000 UTC Saturday to 2359 UTC Sunday. There a couple quirky things for this contest to remember. Any single operator competing for a top three finish at the World, Continent, or USA level, must record the transmitted and received audio as heard by the operator for the duration of the contest operation. You must submit a log within five days. If you use a CW decoder, the DX summit the skimmer or reverse beacon network you must enter as assisted category.

So have a good contesting month and don't forget to submit a log and if you hear a contest station on the bands don't forget to give a contact.

Both contests should offer up loads of fun.

73

James.

Remembrance Day Contest 2015

Alan Shannon VK4SN

Congratulations this year, again go to VK5, followed by VK7 then VK6. VK5 logs were larger than most and their state raw score was second only to VK2, having an outstanding score of over ten thousand points. VK1, VK4 and VK5 are on the down turn for log submission, with VK4 dropping from 41 to 16 over 4 years. Luckily all the other states have had an increase in log submission. This year general comments indicate slow progress in the RD. This is backed up by most logs containing less calls this year, except for the winners who stayed the distance and even broke some records. There were slightly less stations on air this year, but obviously not staying on all weekend.

Reasonable conditions were had this year for all bands. Except for VK5 and VK6 making consecutive band contacts from 1.8MHz to 3.4GHz, other states made little use of 21 MHz and above. I know band conditions from SE VK4 were not that good.

CW operators will delight in extra activity as the SSB to CW ratio closes even more. The ratio of SSB to CW is now at 7:1, where last year was 9:1, 13:1 and the year before 31:1. I was surprised to read some comments where operators thought it was slower on CW this year. Not so say the statistics. There were 3166 logged CW contacts compared to 2722 last year. There were approximately 1075 stations participating compared to last year's 1120. Logs were received from 20 Foundation, 17 Standard and 170 Advanced licences making up 19% of actual participants. 9 paper logs and 198 electronic logs were received. Of these, 4 were treated as check logs due to missing receive or transmitted exchanges. 120 logs contained HF contacts only, 75 contained HF VHF & UHF contacts, and 12 VHF and above logs were received. No logs were received from VK8, VK9, P2 or ZL although there were 50 ZL stations and one P2 station giving out numbers.

162 operators used VKCL Logger, 19 RD Logger, 3 Excel and the rest various non-conforming loggers not designed for the RD causing unnecessary work to be done by the manager.

If it were not for one VK5 station, correct logging of callsigns would have been 100 percent. Huge congratulations are in order for everyone else now logging portable and mobile stations correctly.

Comparing results for each state can be done using Table 1 below.

Individual efforts

The best individual effort goes to VK5CB in the SO Phone category with a total of 930 points. Peter VK2PR in the SO Phone category ran second with 873 points. VK5SFA had the next highest score 764 taking out first position in the SO Mixed section.

72 operators were spread over eight (8) Multi Single and nine (9) Multi-Multi stations. That's 25 or so ops down on last year. VK2GGC Multi-Multi station operated by VK2PV VK2SD VK2MOR VK2ZMT VK3ATV VK6SJ and VK2ON, smashed VK4WIL's MM record (1153 pts) recording 1267 points after losing a few points during log checking. VK2GGC said last year that they will be using their new antennas for this RD and it looks like they are working well. Well done guys. Unfortunately VK4WIL will not be around to challenge next year as the doors for business closed on the 8th of August due to lacking numbers.

The QRP section was represented by 20 log submissions. Once again the Mixed section saw the best performance by Tim Dixon VK5ZT with 567 points, well ahead of last year's 489.

Table 1: State by State comparison.

STATE	NR of LOGS	LOGGED CNTCS	PH	CW	RAW SCORE	WEIGHTED SCORE	Unique Participants
VK 1	3	198	72	126	330	0.85	20
VK 2	41	7188	5810	1375	10438	2.57	254
VK 3	40	4595	4364	231	5452	1.35	245
VK 4	16	2986	2604	347	4150	1.51	170
VK 5	30	4645	3808	837	7536	5.18	130
VK 6	58	4221	4053	165	5663	4.26	124
VK 7	19	2242	2136	106	2754	4.83	76
VK 8	0	0	0	0	0	0.00	4
ZL	0	0	0	0	0	0.00	51
P2	0	0	0	0	0	0.00	1
TOTAL	207	26075	22847	3187	36323	TOTAL	1075

TEAM NAME	CALLSIGN1	SCORE	CALLSIGN2	SCORE	CALLSIGN3	SCORE	TOTAL
ELIZABETH ARC	VK5ZD	745	VK5ZT	567	VK5NE	424	1736
NERG	VK3MEG	246	VK3AWG	419	VK3SIM	639	1304
NSW Wombats	VK2GR	506	VK2IR	336	VK2PN	292	1134

able 2: Teams.

ll-Time Records. 2012 onwards

Category	Year	Callsign	Score
SOPH	2012	VK7NET	1055
SOCW	2015	VK5LJ	598
SOMX	2014	VK2BJ	1030
QRPPH	2013	VK6FMON	448
QRPCW	2015	VK5NE	424
QRPMX	2013	VK5ZT	810
MS	2014	VK2GGC	1148
MM	2015	VK2GGC	1267

able 3: All-time records, 2012 onwards.

Although there is no Rookie category (i.e. first year as an amateur), VKHAM (.com) has kindly sponsored an award for the highest scoring Rookie. This year, 12 new Rookies took part. Congratulations to VK5FABG with 288 points in the QRP Phone section.

The top three Foundation licensees were VK5FDEC 311 QRP PH, VK5FABG 288 QRP PH, and VK6FMON 238 QRP PH.

Six teams were submitted with team Elizabeth ARC (VK5ZD VK5ZT VK5NE) romping in with 1736 points, followed by NERG (VK3MEG VK3SIM VK3AWG) with 1304 points.

A full list of statistics, photos and other information is on the WIA RD website in PDF format. Awards will be sent from the WIA office for all major 1st, 2nd, and 3rd place winners. Downloadable PDF certificates for individual state placings are available.

See Table 4 for the complete list of operator results.

Best 73, Alan Shannon VK4SN

Complete Results are available on the WIA website:
http://www.wia.org.au/members/contests/rdcontest/

Over to you

Amateur licence fees

Find below a letter sent to the Hon. Mitch Fifield, Minister for Communications, regarding the current debate around amateur licence fees.

Dear Minister,

As a result of a story on the Wireless Institute of Australia's website (WIA) at http://www.wia.org.au/newsevents/news/2015/20151002-1/index.php, the Amateur Radio Community has become aware of lobbying efforts of WIA to attempt to scuttle attempts for Radio Amateurs to lobby for the removal of personal (individual - not link, beacon, repeater, group or "vanity" licences) licensing fees.

This I feel is heavily against the interest of Australian Radio Amateurs and the wider Australian Community. Radio Amateurs in many countries, including New Zealand and the United Kingdom do not pay ongoing licence fees as the regulatory agencies have determined that it is both undesirable and uneconomic to collect ongoing licence fees. Yet it is highly important to note that regulatory agencies in these countries still provide a high level of service to Radio Amateurs despite the fact that no ongoing licence fees are paid.

It is my understanding that a cost-benefit analysis conducted recently within the ACMA itself has similarly determined that the ACMA may actually reduce "red tape" and improve service response times (to other customers) and thus time and money if ongoing personal Amateur licence fees are not collected. From my information, the Amateur Radio licensee tends to create more enquires and hassles than any other form of licensee.

Note that I am not recommending that establishment fees should be eliminated as I can recognise that there are costs associated with this and with maintaining ongoing specialist licences such as licenses for repeaters, beacons, links and groups/organisations.

The WIA has an advertised position, through the above cited article, where they state that they feel that the Wider Amateur Radio Community will not receive any services from the ACMA if fees are not paid. I feel that this view is delusional and un-representative as the Australian Constitution, and various High Court Rulings, challenges legal validity of this assertion; the Constitution requires the Federal Government to manage and service the communications of this nation and this requires consultation and servicing.

The WIA I feel is no longer representative of the views of the wider Amateur community on this issue. The fact that the Wireless Institute of Australia only represents less than 1/3 of all licensed Amateurs, with a declining membership base at the rate of 100 members/month (without clear long-term evidence of ongoing membership growth), should be a clear reflection that the majority of the Amateur Community do not have great confidence in the representative ability, nor the direction of this organisation, with respect to representing the interests of Australian Radio Amateur Operators on this matter.

Primary advisors from the WIA are former high-ranking ACMA and former DoC officials that have great familiarity with the Act and its original intent as they wrote the original Act and many regulations associated with it. This, in my opinion has created a "tunnel-visioned" approach within the WIA whereby better alternatives for Government and the community-at-large have not been explored and thus have been actively worked against; familiarity and legacy has been relied upon rather than innovation.

There is a feeling by some that the WIA also could devolve financial and personnel gain through having accidental licensing drop-offs and renewals. This could be another misguided reason for the WIA for working against its members (and non-members that it purports to represent).

I would encourage you to invoke and undertake a review, and perhaps a public enquiry, into the economic feasibility and community desirability of actually collecting ongoing fees for personal Amateur Radiocommunications licences.

Regards,
Stephen Ireland VK3VM / VK3SIR
Assessor: 3-072
(Member of the WIA)

Fun to flower in the Spring VHF-UHF Field Day 2015

Roger Harrison VK2ZRH

Spring 2015 Event Dates

Saturday 14 and Sunday 15 November

Duration, all call areas other than VK6
0100 UTC Saturday to 0100 UTC Sunday

Duration in VK6 only
0400 UTC Saturday to 0400 UTC Sunday

A Spring Haiku

The blustery, cold
darkened hours of winter past
forgotten. Spring blooms.

This event will faithfully follow the pattern of the Winter 2015 event, which, while retaining the two Divisions, introduced a number of changes – in particular, the revised categorization of Sections and Sub-sections, the two-hour re-work period and the exchange of 6-character locators for all contacts. However, from experience with the Winter event, as kindly advised by some of the entrants, the rules for logging and log submissions for Digital operation have been clarified for the sake of practicality.

I note from chatter around the VK Logger, and from presentations at GippsTech 2015, that some keen operators have been busy beefing-up their portable station capabilities, to play on more bands and to improve pointing of beams and dishes. Lou Blasco VK3ALB commented on the VK Logger in June 2014 that, *"Winter field day is a great time to test new ideas and equipment. Failures and mishaps hurt much less in the Winter than they do in Spring or Summer." Well, as they say in the old books, "the proof of the pudding is in the eating."*

Highlights

Newly-licensed operators, or those new to the bands above 30 MHz, or those returning to the hobby after a period of absence, are encouraged to enter the **Single-band only** Sub-section. If you're in this group, but have your stuff a bit more together, consider entering the **Four-bands** Sub-section; at a minimum, you can operate on any two of the bands 6 m/2 m/70 cm/23 cm, or three, or the whole four.

A founding principle of the Field Days is to go out and have fun, so the Single-band and Four-bands Sub-sections can provide a taste of that for newbies.

If you're an 'old hand' at field days, invite an F-call or Standard to join you in the field. Or, invite an F-call or Standard to your home QTH for a few hours of the contest. The same goes for those returning to the hobby. Get them involved and mentor them through the process of making contest contacts. Pretty soon, the fun seeps into their amateur bones.

When finalizing your plans for the Field Day weekend, take advantage of the facility offered by the Contest Radar website (*www.contestradar.com*). Enter your planned portable location (4- or 6-character locator), or your home QTH, along with other salient station details. The website will display your details on a map – along with the fleet of other stations doing the same. You can see at a glance who's where. Notably, the website is integrated with the VKCL logging software.

Sections

A: Portable station, single operator, 24 hours (A1) OR 8 hours (A2).

B: Portable station, multiple operators, 24 hours (B1) OR 8 hours (B2).

C: Home station, 24 hours (C1) OR 8 hours (C2).

D: Rover station, 24 hours (D1) OR 8 hours (D2).

Note that 8 hours means **any period up to 8 hours** *(but the period must be contiguous)*; i.e. you can submit a log for a few contacts (even just one!). Likewise, 24 hours means any period from 8 hours up t 24 hours.

Sub-sections

(a) Single-band only: any single band permitted on the operator's licence.
(b) Four-bands: 6 m/2 m/70 cm/23 cm – at least two, up to the four – only.
(c) All-bands: all bands 50 MHz-up permitted on the operator's licence.
(d) Digital: contacts using non-voice digital modes (e.g. FSK441, JT4, JT65, MAP65, PSK31, RTTY, etc) are encouraged for any Section–Sub-section, but entries must be submitte in a separate log, scored separately. Operators may submit a log for any other section in addition to their digita log entry. 'Digital' means those modes where the received signal is decoded by a computer.

Stations entering the all-bands sub-sectio cannot enter additional logs for the four-bands or single-band sub-sections.

A station operating on any number of bands cannot enter the single-band sectio for each band they use. *That's not in the spirit of this section!*

General Rules

There are two Divisions:
Division 1 scores contacts on the basis of Squares (4-character locator) worked; Division 2 employs distance-based scorin Operators may enter either Division 1 or Division 2, or both. See the scoring rules below. A Square refers to the Maidenhead Locator system definition – as denoted by the 4-character locator. To facilitate scorin

ır Division 2, all stations are required to xchange SubSquare locations (i.e. the -character locator).

perating periods:

tations may elect to enter either a 24-hour ection or an 8-hour section, but not both. ıose stations entering the 8-hour sections ıay operate for more than eight hours, ıd nominate which 8-hour period they ish to claim for scoring purposes, but **ıe 8-hour (or lesser) period submitted as to be contiguous**, unlike what was ıblished in the May issue of *AR* magazine. nfortunately, an analysis of the impact non-contiguous periods revealed that it eated an inordinate amount of work and me in log assessments.

over stations:

ıe Rover section is for all portable or ıobile stations that operate from more than vo Squares or that change Squares more ıan twice; i.e. Square A to Square B to quare C, etc., or A-B-A-B etc. However, a ation may move from Square A to Square and return to Square A, without having to ıter as a Rover.

ntering more than one section:

a Portable or Rover station spends part the contest period operating from their ome station, they may also enter the ome station section.

vo operators:

two operators set up a joint station with ıared equipment, they may choose to ıter Section A or C as separate stations ıder their own callsigns, or Section B ıder a single callsign. If they enter as eparate stations, they may not claim ontacts with each other.

Iulti-operator stations:

ortable stations with more than two erators must enter Section B under one allsign. Operators of stations in Section may not make contest exchanges using allsigns other than the club or group allsign. Home stations may enter as a ulti-operator station, but only one callsign an be used.

)perating Rules

ne callsign per station. Operation may be om any location. A station is portable only all of its equipment is transported to a ace that is not the normal location of any ıateur station.

It's rumoured there's a kitchen sink in there. Peter VK4EA seems well-organised for portable operations.

You may work stations within your own locator Square.

Portable stations may change location during the Field Day, provided that the station is dismantled and reassembled at each move.

Repeater, satellite, EME or crossband contacts are not permitted.

Except for CW, no contest operation is allowed below 50.150 MHz. Recognised DX calling frequencies must not be used for contest activity. Suggested procedure for SSB stations is to call on .150 or higher on each band, and QSY up to make the contest exchange.

Stations may enter either Division 1 or Division 2, or both.

About Contest Exchanges

RS or RST reports, a serial number, and your **6-character** Maidenhead locator (the Sub-Square). The Maidenhead locator is optional if it has already been exchanged in a previous contact during the Field Day and neither station has moved since then.

Note that Squares must be used for Division 1 scoring calculations.

For digital contacts, as RS or RST reports plus serial number make for a cumbersome exchange, it is sufficient to exchange callsigns and 6-character locators, plus two further digits that can not be predicted by the other station. This is similar to the practice used in the annual Ross Hull contest. However, when compiling your log to enter the contest, include a unique serial number for each successful contact.

Repeat Contacts – Re-work Period

Stations may be worked again on each band after **two** hours have elapsed.

If either station moves to a new location in a different Square, repeat contacts may be made immediately. If the station moves back into the previous locator Square, the re-work period limit of two hours still applies to stations worked from that Square previously.

Your Log

Your log should cover the entire operating period and include the following information for each contact: UTC time, Frequency, Station worked, Serial numbers and locators exchanged.

- All-band stations cannot submit a separate log for a single-band or four-band entry.
- Logs for a single-band operation must not include any contacts on other bands.
- Logs for a digital operation must not include any contacts using non-digital modes.
- Logs for a four-band operation must not include any contacts on other bands.

Division 1 Scoring

For each band, score 10 points for each **Square** (4-char. locator; i.e. the first 4 characters of your 6-char. locator) in which your station operates, plus 10 points for each Square worked, plus 1 point per contact. Multiply the total by the band multiplier, as follows:

6 m	2 m	70 cm	23 cm	Higher
x 1	x 3	x 5	x 8	x 10

then total the scores for the bands used. Thus, the score is based on totalling the number of locator Squares worked and the number of contacts made.

Division 2 Scoring

All contacts are scored on the basis of one point per kilometre, multiplied by the scoring Multiplier for each band in Table 1, with points/100 km applied after 700 km for 6 m, 2 m and 70 cm, to 'flatten' scores for DX experienced under enhanced propagation conditions on these bands. A 200 km contact on 432 MHz would be 200 x 2.7 = 540 points. A 1000 km contact on 50 MHz would be 703 x 1.7 = 1195.1 points[1].

The distance error of using Sub-Square (6-character) locators is small and accuracy is sufficient for the purposes of this event. Distance is calculated from the Sub-Square centre.

Total the scores for the band or bands used.

Submitting Your Logs

Only electronic logs in ASCII text (.txt) format are being accepted now. **Note:** If any operator participating in the contest has a genuine disability or other impediment preventing submission of a digital log, a paper log will be accepted, provided it reaches the WIA National Office by post or fax by the deadline time and date.

Band	Multiplier	Distance Scoring
50 MHz	1.7	1 point / km to 700 km; thereafter 1 point / 100 km or part thereof
144 MHz	1	1 point / km to 700 km; thereafter 1 point / 100 km or part thereof
432 MHz	2.7	1 point / km to 700 km; thereafter 1 point / 100 km or part thereof
1296 MHz	3.7	1 point / km.
2.3/2.4 GHz	4.4	1 point / km.
3.4 GHz	5.4	1 point / km.
5.7 GHz	6.4	1 point / km.
10 GHz	7.4	1 point / km.
24 GHz & up	10	1 point / km.

The free VK Contest Log (VKCL) software, from Mike VK3AVV, caters for the VHF-UHF Field Days (including Division 1 and Division 2 scoring) as well as a host of other contests. You can download it from: *www.mnds.com.au/vkcl/*

A **Cover Sheet** must be included with your log, which clearly states: –

- the Contest event (i.e. Winter 2015 VHF-UHF Field Day) and its date;
- Division 1 / Division 2 (as appropriate);
- the relevant Section–Sub-section and the Period (24 hr or 8 hr);
- Name and Callsign of operator submitting the entry; Names and Callsigns of other operators for Multi-operator stations;
- contact email address; mailing address, and
- a declaration that the operator/s have abided by the rules.

Upload your logs via the WIA website Field Day Log File Uploader, at: *www.wia.org.au/members/contests/upload/*

Logs must be received by **midnight, Monday 30 November 2015**. Early logs would be appreciated.

Certificates

Each top-scoring station in every Section–Sub-section will receive a colour certificate in .pdf format, sent to the contact email address on their log cover sheet.

In addition, colour certificates will also be sent to all second and third place-getters and top-scoring Foundation stations.

Check for Updates

Check for any updates or advisories on the VHF-UHF Field Days website at: *www.wia.org.au/members/contests/vhfuhf/*

The Next Event

The Summer 2016 event will be over Saturday 9 and Sunday 10 January.

References

- Roger Harrison VK2ZRH, *The basis of distance-based scoring for the VHF-UHF Field Days, Amateur Radio*, June 2014, pp 11-13.

VK4news BARC

Les Neilson VK4FAEB

Foundation Courses

Brisbane Amateur Radio Club would like to congratulate all club members who attended the two Foundation licence courses run by BARC earlier in 2015 which were conducted by Peter VK4COZ and Kevin VK4ZR. Assessments were supervised by Les VK4SO and Chris VK4YE.

Chris also arranged for Shannon to have a special oral exam which resulted in him recently becoming a Foundation licensee and is now eagerly awaiting allocation his call sign. With Shannon recently passing the exam, it means that everyone who attended the two courses have been successful in obtaining their Foundation licences:

Steve Christensen VK4FSDC, Noel Fogarty VK4FAFC, Malcolm Hinson VK4FAIA, Brad Izzard VK4FBRA, Keith MacKenzie VK4FVKM, Greg Myer VK4FPGM, Evan NicholsVK4FMAD, Tony Rush VK4FTAR, Charlie Williams VK4FAIB and Shannon Duffy VK4FXXX.

IOTA

: was decided that as JOTA was nly two weeks away (16th, 17th· 8th October), the finishing of the hut /ould not be able to be completed ı time for its use for JOTA this year. Many thanks to the volunteers who ave helped so far to transform a very rdinary looking site office to an asset f which members can be proud.

For JOTA to be successful or Rochedale Scouts, it will be ecessary to start preparations or setting up base stations similar o what we achieved in 2014 to ommence as soon as possible. We ill start preparation on the Saturday efore 10th October by installing pes over some trees so that aerials ill be easily erected on the day.

Club President Les Neilson xplained that the Club will need to ll the positions of two **Repeater fficers**, the positions created to anage the club's 70 cm repeater.

Kevin VK4WA the Club repeater fficer reported that he intends sing voice ident on the repeater as ecommended by the WIA. He also uggested helping members who can ear the repeater but have difficulty iggering it, that a 10 metre FM ansceiver be used to provide input o the repeater. The frequency to be ıvestigated is 29.23 MHz. A suitable ertical antenna for 10 metres will be ıstalled plus a suitable 10 metre FM eceiver will be located.

The proposal to shift the repeater o Mt Cootha may run into a problem f being triggered by other repeaters t Gympie and Parrots Nest NSW .ismore) as the extra height of Mt Cootha will provide access from emote locations that use the same equency as VK4RBA of 494.950 /Hz input. Other alternatives are urrently being investigated.

BARC Asset Register Our asset egister is way out of date and will equire a lot of combing through our ld register and storage facilities to letermine what we have got what we ant to keep and what to dispose f. This role will require at least two olunteers with firstly Les VK4SO aking up the challenge.

Education Training officers: Two positions will be created with Jan VK4EBP being trained by the WIA first off the blocks.

Licence Assessor: We currently have only one assessor in our club, Les VK4SO, so we intend to create another two positions with Kevin VK4WA to undertake training for this position.

As the WIA will only allow one person to be trained for each position at a time, after both have been trained they will then undertake training for the Training and Assessor positions. So at the conclusion of the WIA courses, the Club should have two training personnel and two extra people as assessors.

Our intention for the coming 12 months is to conduct more Foundation licence courses and prepare Foundation members who wish to upgrade to a Standard licence starting with training on the basics of electricity with a study on conductors, insulators, EMF, resistors and currents plus the vital understanding of Ohm's Law.

Club Website

www.qsl.net/vk4ba

The Existing Club website will be updated in the short term with new information, but with a view to migrating to a more user friendly website in the near future. Robert VK4HBD will be overseeing the updates and providing the club with options for a new website based on club feedback

We also have a Facebook site available *https://www.facebook.com/Brisbane-Amateur-Radio-Club-BARC-VK4BA-879007988845541/timeline/* thanks to Keith, our Scouting representative, which we have begun to populate with upcoming events and activities.

Meeting times and dates for the Club will be available on the website shortly with a Calendar provided for the year, including marking out our Business Meetings, which will be held four times in the year.

Arrangements have been organised to have the Scout Hall available for the 2nd and 4th Friday nights plus the 4th Saturday afternoon to cater for working bees.

Southside Amateur Radio Society

Southside Amateur Radio Society farewelled much loved Clem VK4XCS as the outgoing President and thanked him for all the love and support he gave to the Club, via the Ham Fest, public awareness and holding meetings in his own home. All the best for your future Clem and we look forward to hearing you on the air in the near future.

The Club also welcomed their new President Pat Sullivan VK4FPAT who has inherited a busy role and has thrown himself into the process of finding a more suitable meeting place for members that the club can settle into, and is currently looking at a few options that will be centrally located within the Logan area.

Meanwhile the club is still busy with their current activity plans which include:

Mt Cotton VK4RAX - We have been able to purchase our own repeater after years of relying on borrowed equipment and this will allow the club to have security of our own equipment and to plan the refurbishment of the antenna array and also to record a new Repeater Ident voice over (who will be that voice?).

The club has plans to increase output from 30 to 120 watts - application submission is now with the ACMA.

Other improvements in consideration include:

Data Microwave link 2.4 GHz
Operational ATV repeater
10 GHz Beacon and maybe a HF beacon as well as live webcam action from the repeater tower.

We are also in the exciting process of developing a new Club logo, which should be available for comment at our next Club meeting: it has been a lengthy process full of setbacks to get it to this stage, but it will be worthwhile once club consensus has been reached and we can then finally roll it out.

Thanks
Pat Sullivan VK4FPAT.
73
Les Neilson VK4FAEB.

VK2 news

Tim Mills VK2ZTM
vk2ztm@wia.org.au

This month [November] at ARNSW is full of activity. On Sunday the 8th there will be another in the field day format with the emphasis on the family. For the OMs in the morning Peter Jensen VK2AQJ will talk on 'portable military and clandestine developments' and the children will have face painting, hair glitz, balloon sculpting and other activities. There is a catered lunch so members must register by an email to *fieldday@arnsw.org.au* In the afternoon for all there is a magician. More details have been given in the Sunday VK2WI News.

The September Trash & Treasure was well attended and a lot of equipment found new homes. The Home Brew meeting after the T&T was also well attended where the main lecture was on Smiths Charts given by Roger VK2KXG.

Later in the month at ARNSW there is the Foundation course and assessments on the weekend of 21 and 22 November. Bookings are heavy but inquiries to *education@arnsw.org.au* Sunday 29th will be the final Trash & Treasure for the year. Then it all starts again in January 2016. The ARNSW 2016 magnetic calendar will be sent to members members before the end of the year.

In the past two years ARNSW has conducted a Development Fund to assist VK2 clubs. A decision about 2016 is yet to be made but it is expected that details will be notified in the January/February issue of *Amateur Radio* magazine.

Summerland ARC at Lismore in northern VK2 held a successful Standard course in late September. They have an Advanced course planned for the week 2 to 8 November. Inquiries via *education@sarc.org.au* A SARCFEST is planned at the Richmond Hill Community Centre on Sunday 28 August 2016.

While some clubs grow there are others that fall on hard times. The **Liverpool & District ARC** with falling membership and losing a meeting place are planning a wind up meeting this month.

The **Armidale ARC** held their AGM in late September. **St. George ARS**, with help from **Waverley ARS**, provided an assessment for nine candidates from the UNSW School of Electrical Engineering who were all successful; The **Oxley Region ARC** has been upgrading various facilities with the repeaters and the web site. Their Christmas party will be held on Saturday 5 December.

The newly formed **Bateman's Bay Amateur Radio Society** have meetings every second Wednesday of the month at Maring Rescue, Hanging Rock at 6.30 pm. The club callsign is VK2BAY. They have established a 2 metre repeater on 147.075 MHz at Mt. Wondorra. President is Rob Loftus VK2ADG and email contact with the club is *robloftus@tpg.com.au*

This month the **Mid South Coast ARC** have their quarterly meeting on Saturday 14th; **Waverley ARS** have a Foundation and assessment weekend on the 14th and 15th. Inquiries by an email to *education@vk2bv.org* ; **WICEN NSW** have an exercise at Jenolan Caves with the Cave Rescue Squad on 31st October and 1st November.

73 – Tim VK2ZTM.

ALARA

Christine Taylor VK5CTY – Publicity Officer

Photo 1: YLs at lunch (see text).

The Constitution

This is still the main concern of the ALARA committee. It really is essential that everyone either votes for or against the new Constitution, which has been sent to you recently, or you can nominate someone on the committee to vote on your behalf by giving them your proxy vote.

It is a government requirement that a minimum number of members of any organisation, which has a new constitution, do vote.

Monday Night Nets – soon to be on EchoLink

These are held on 3.570 at 1000Z in the summertime and 1030Z in winter. Unfortunately the propagation is not so good at the earlier time but it is OK except then there are electrical storms around, either here on earth or on the sun.

Please do listen in and join us if you can. We do prefer to have the first three rounds to the YLs but we welcome OMs after that. We KNOW there are a number of eavesdroppers! One of the first things discussed is the weather in each of our QTH so we get a picture of the differences here and there. It is interesting.

For some months Marilyn VK5DMS, has been going round to the QTH of Wolfe VK5HWL as the one thing she and Geoff VK5ACZ did not check out before they moved from Mildura to Adelaide was the radio noise level! Although Wolfe is only a few streets away, there is an enormous difference in that noise.

However, on the most recent Monday we heard Marilyn from her home QTH using the Magnetic loop antenna Geoff has been building. The signal was great. If there is anyone else in the same noise situation (or anyone living in an area where towers are not possible), this is an effective aerial, indeed.

Photo 2: Magnetic Loop.

Photo 3: Magnetic Loop.

Photo 4: Radio gear.

VK3 Lunch from Jean VK3VIP

Our September ALARA lunch was held at the Sandbelt Hotel in Moorabbin

A fine turn out saw fFifteen YLs who brought along Ten OMs. The Luncheon was organized by Donna VK3FRET, who did a fine job. The food was good and the venue was comfortable with the Oms finding a corner with nice armchairs for a pre- luncheon tipple and a chinwag. The Ladies called them to order and the OMs joined them at a long table seating everyone.

During the event Lisa VK3FNET signed up for ALARA membership.

Lisa gained her Foundation licence just a few weeks ago, so it was very nice that she was able to join us. Also joining us was Julia the sister of Pat VK3OZ who was on Holiday from the UK.

Judy VK3FJAG told us about he recent holiday in England.

The OMs brought a small mobile 2 m and 70 cm for show and tell and passed it around so all the YLs could have a good look.

This is the list of names from the lunch: Donna VK3FRET, Cheryl VK3FCYL, Judy VK3FJAG, Susie VK3FSUZ, Pat VK3OZ, Carla, ALARA member Elsie [VK3VIP mum Kaye VK3FKDW, Robyn VK3WX, Susan VK3FZZY, Julia [Pat sister] and Jean VK3VIP.

33

Christine VK5CTY

Spotlight on SWLing

Robin L Harwood VK7RH
vk7rh@wia.org.au

2015 is rapidly coming to its conclusion with a continuing decline in propagation and further HF broadcasting cutbacks. We are headed to a Sunspot minimum, which will mean the lower frequencies will come to the fore with the upper ranges failing to propagate. I have already noted very few signals above 18 MHz, although I would not be surprised by high traffic volumes during the CQ contests at the end of October and November. It has been quite odd not hearing any utility or broadcast stations only to find the amateur allocations heavily occupied.

It was recently announced that the BBC Monitoring Service at Caversham Park, near Reading, may be relocated. This service commenced at the outbreak of World War II and was based at Caversham in 1942. I believe that there has been a reduction in staff and much of the facility is unused as there are so few shortwave broadcasters to monitor. It is much easier now to access these via the WWW. There are several apps readily available with thousands of stations that are easily downloaded or streamed. Utility services, of course, come under the umbrella of other secretive monitoring entities.

Medium wave broadcasters in Europe are also disappearing. Holland closed down AM broadcasts at the end of August and France is scheduled to do likewise at the end of 2015, starting with the Longwave and then the public broadcasters on MW. Norway has gone even further and abandoned FM in favour of DAB+. Germany abandoned LW about a year ago and has been gradually closing MW stations. Dublin wants to close down a station on 252 kHZ but due to strong objections from the large Irish diaspora in the UK, postponed this until 2017. Also Ofcom has been planning to reduce AM in the UK and also switch FM over to DAB but there has been strong public opposition to these mooted changes. I am reliably informed BBC Radio 4 on 198 kHz is on borrowed time and if the senders fail, they probably won't be replaced. Radio 4 is on FM and DAB. Incidentally, the UK is using DAB and not DAB+ we have here in Australia.

The other digital mode, DRM, has not really won overall public support. I believe that a powerful DRM-capable MW sender was recently inaugurated in India. However there are very few receivers capable of decoding this mode. I believe that models will be available there for under $200 via *amazon.com.in*

I have been frustrated by this persistent hearing loss, which has made monitoring very difficult at times. Recent tests have actually determined that my aural range has not declined, so it does look as if the problem lies with my hearing aids.

I am finally on the NBN and I will have more on this in next month's column.

Until then, the very best of monitoring de VK7RH.

VK5news Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

Buy and Sell

Remember—the AHARS Buy and Sell is on **Sunday 1st November** this year. Go to the club website if you want to have a table of your own or one to share with someone else.

This is the biggest Buy and Sell of the year in VK5 and the place where we all meet friends we haven't seen for a long time. Whether they are sellers or buyers, or just lookers, everyone will be here. Front door opens for food and greetings at 9.00 and the selling hall opens at 9.30.

Photo 1: Dongle.

September Meeting

The topic for the night has many applications. Bill VK5DSP talked about a 'dongle' that can turn your computer into an SDR, a software designed radio almost instantaneously. OK it is a very simple SDR at that point, but with a few additional packages it can be a very powerful system.

It is the RTL Dongle. It has two chips inside that make it so clever. There are some problems with shielding and with any local strong signals but others who are happy to share their knowledge with you have solved these. Much more information and help is available on the RTL website.

As well as the SDR application, this dongle can turn your computer into a vessel-tracking device, tracking ships or planes. It can be used to receive satellite weather information, or you can use it to do some radio astronomy such as plotting hydrogen lines from pulsars etc. Basically the dongle can be tuned to almost any frequency, to suit whatever use you want.

Bill had several programs running, including one where the dongle was plugged into a Raspberry Pi computer board.

Software is available for Windows, Linux and android applications and he knows of someone who has used his mobile phone as an SDR through an RTL dongle. Astonishing!!

See you at the BUY and SELL.

73

Christine Taylor VK5CTY.

Photo 2: Computer Board.

Help us

Contribute to the **Weekly WIA News Broadcast.** See our website for details.
www.wia.org.au/members/broadcast/contribute/

VK3 news Amateur Radio Victoria

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

Victorian National Parks on the air

The Keith Roget Memorial National Parks Award (KRMNPA) activity period is this month. Whether you're an *Activator* or *Hunter*, or just want to give it a quick try, then your involvement will be greatly welcomed.

So far 25 National Parks have registered for the KRMNPA activity period, Friday 13th until Monday 16th November 2015.

One of them is the Brisbane Ranges National Park where Terry VK3UP will set up the control station VK3WI, on the Saturday and Sunday. VK3WI will have the latest on activations and be able to give general Award information.

As an extra incentive this year, there will be a free "participation certificate" for those registered as an *Activator* who log at least five *Hunter* contacts.

Active National Parks will be spread throughout Victoria, making them an ideal opportunity to "team up" with other radio amateurs to provide transport and combine suitable gear for a successful portable operation.

Some who venture to the National Parks may have a single activation in mind, while a few will opt to operate from several locations on their chosen route.

For example, Tony VK3VTH has five registrations and Tim VK3MTB has three on his list. So far three Foundation licence holders will be in the event.

From South Australia are Paul VK5PAS at Port Campbell & Great Otway National Parks and Tim VK5AV in Lower Glenelg National Park.

A list of those registered is available under the Awards tab on Amateur Radio Victoria.

All inquiries to the Award Manager Tony VK3VTH via email: *vk3vth@amateurradio.com.au*

Plans next month & in 2016

Looking ahead, some initial planning has begun on the portable activities by the state-wide organisation.

This is to include VI3ANZAC at Fort Gellibrand in Melbourne's inner west as the WIA finishes its successful ANZAC 100 program on December 20, timed to coincide with the withdrawal of troops from Gallipoli in 1915.

ARV opened the event on the ANZAC Day weekend, by putting VI3ANZAC to air at Swan Hill in northwest Victoria, helped by the Sunraysia Radio Group.

A very memorable commemoration took place at the Lake Boga Flying Boat Museum, home of the historic Catalina Flying Boat and site of the secret RAAF Repair Depot.

Further in 2016, ARV is likely, once again, to include operations during the International Lighthouse and Lightship weekend in August - a regular event at the Williamstown Timeball Tower.

A new event also being considered is a series of four technical talk "show and tell" type activities at various National Parks on a Sunday morning, followed by a sausage sizzle. More details early in the New Year.

Technical report

The rack-mounted VK3BWI broadcast facility is to be upgraded with the main changes being new transmitters now fitted for the 2 m outlets of Mt Macedon VK3RMM and Mt Dandenong VK3RML.

While listeners to the weekly VK1WIA broadcast should not notice any difference, more modern, efficient and reliable transmitters are now being used. There have been other minor changes.

A number of ARV sponsored repeater sites are being upgraded. These include the VHF and UHF repeaters at Mt Wombat near Shepparton that is set to get a new mast and equipment.

The VK3RGV site will be off the air during these necessary works, but on return will continue to better serve a wide area.

Major works are also planned for Mt Big Ben VHF/UHF VK3RNE repeaters in the north-east. With warmer weather final works are due on the fire-destroyed Mt Stanley VK3RNU site near Wangaratta.

Membership inquiries

The lower ACMA annual licence renewal cost can be a further financial incentive to join and suppor this organisation. The question often asked is what membership has to offer, and immediately the repeater networks, QSL bureau and other services are considered.

Some may think because they don't use all of those services, membership is not for them. However, Amateur Radio Victoria interfaces with the general public and brings new blood into the ranks.

Supporting it through membership enables the organisation to offer training and education, and appropriate promotion.

To join and support the state-wide organisation costs $30 for Full or Associate membership and $25 Concession, for two years. New members are most welcome and an application form can be found on our website or posted out on request.

VK3news Geelong Amateur Radio Club

Tony Collis VK3JGC

Mt. Anakie Site Upgrade - VK3RGL

Since its construction in 1987 little had changed at the Mt. Anakie site with the exception of the 2 m and 70 cm repeater equipment for VK3RGL.The basic site infrastructure (antennas, filters, feeders, racks and DC power distribution) had remained virtually untouched and were now in need of an upgrade to bring the site back to current commercial standards, now applicable to all the GARC's repeater sites, as an integral part of the overarching **GARC Repeater Linking Project.**

This upgrade consisted of initially clearing the building of all non-essential items and then sealing the floor to reduce dust. Next the battery box was extended and the antenna combining and filtering equipment was wall mounted. The overhead cable trays were extended and the DC power distribution rack was upgraded. Four new equipment racks were installed to cater for St. John Ambulance, the RGL repeaters for 2 m and 70 cm and the beacons for 2 m and 70 cm with a fourth rack for future expansion.

Photo 1: The rack mounted equipment for the 2 m and 70 cm VK3RGL.

The 2 m beacon power output was also increased and GPS locked.

Photo 2: The mast at Mt Anakie.

Work on the VK3RGL antenna systems involved replacing the antenna feeder cables and terminations, upgrading the lightning protection systems and fitting surge suppressors on all the antenna feeders.

The 2 m repeater antenna was replaced and the beacon antenna mast was replaced by a small tower section. The equipment now operating at Mt. Anakie for 2 m is the Motorola MTR2000 and for 70 cm it is the Motorola Quantar dual mode (Analogue/P25).

Installing surface mounted components

As part of the GARC's syllabus topic for the Friday evening sessions we had an excellent talk by Bryan VK3YNG on the implementation of surface mounted components

For the practical session Bryan had brought along his USB binocular microscope so that the GARC members could see clearly

a magnified view of the soldering of the surface mounted components via the overhead projector whilst Brian himself was actually doing the work with the naked eye.

Photo 3: Bryan VK3YNG in conversation with Bert VK3TU.

The GARC Club House east tower refurbishment

The GARC Wednesday Group, now taking responsibility for club maintenance activities, undertook the planned maintenance of the East Tower at the Club House in Storrer Street, which will house beam antennas for 6 m, 2 m and 70 cm in conjunction with a Flower Pot antenna for Omni directional VHF/UHF work. Photo 4 shows the east tower mast tilted over for securing coax cables and rope ties and the cover photo could be viewed as the antenna version of "how many engineers does it take to change a light bulb?"

The Marconi Hut

The first phase of the Marconi Hut upgrade, in conjunction with the Queenscliffe Maritime Museum, was to install a permanent mast by the side of the hut. When completed, Mr John Barrett, President of the Queenscliffe Maritime Museum Inc, believes that "this hut will provide a focus for the museum's early communications exhibitions, and is a valuable education resource for schools and adults to understand the development of communication especially in a maritime and heritag context for the development of communications between ships an across the waters."

Photo 4: Fixing the rotor assembly.

Silent Key

Frank Turnham VK8FT

Frank Turnham was born on the 15th of Jan 1930 in Blackburn Lancashire in the UK.

His mother Eva Gregory named him David Gregory.

Eva was young and not married and after 3 months had to give him up to the Coram family home in London where he was educated and given the name of Frank Turnham. Frank spent the war years in the home and had to be moved to the country away from London.

After the war Frank joined the RAF and was trained in radio communications. In the late 40s he met an Australian wool salesman in an Oxford pub who sponsored him to immigrate to Australia.

In 1950 he landed in Australia and ended up in Adelaide where he worked at the Woomera Rocket Range as a radar technician and also worked for the ABC and PMG. He moved to Darwin where he worked for DCA until his retirement.

Frank was a life member of the DARC and the NT Scout Association. Frank served as Commissioner for Scouts amongst other positions in the Scouts for many years.

He was station Manager of DARC at Fannie Bay and East Point for many years. At the WIA convention in Darwin both he and Terry VK8TA were presented with WIA commendation for their services to amateur radio over many years.

Terry VK8TA and Frank founded the DARC Thursday morning tea club which was initially at Terry's place and then at the DARC clubrooms. Time for a cuppa and a nice piece of cake was a favourite saying. The tea club continues.

Frank never married and was 79 when Richie VK8RR found his mother, brother and sister living in Adelaide. His Mother is still alive at 101. His sister and her husband attended his funeral in Darwin.

Frank will be missed by his many friends from around the Darwin area.

Vale Frank VK8FT.

Richie VK8RR, Station Manager DARC.

VK3news Southern Peninsula Amateur Radio Club

Tim Conboy VK3TJC

view of the part of the crowd at the 2014 event.

adio Fest 2015

ıe Southern Peninsula Amateur ıdio Club (SPARC) will be holding fourth annual Radio Fest on 29th ɔvember 2015 at the Eastbourne imary School, Allambi Avenue, ɔsebud, Victoria.

Each successive year has ·en a large growth in vendor bles and attendees as well as a ry interesting range of technical rums and lectures that continue to ake this one of the fastest growing ınual amateur radio events.

Tables are available at our .cellent venue for those amateurs ıd Traders keen to sell their wares ıd can be booked on-line via our ebsite: *www.rosebudradiofest.com*

Please book early to avoid disappointment. At the last three SPARC Radio Fests many bargains and rare items were available with both vendors and buyers enjoying the day.

Apart from the usual white-elephant sales of the previous years a key feature of the SPARC Radio Fest are the lectures and displays by amateurs, manufacturers and the ACMA. This aspect of the Radio Fest is becoming very popular.

Catering will again be provided throughout the event by the Lions club.

As the SPARC Radio Fest is located on the Mornington Peninsula, with very easy access from Melbourne via the new Peninsula Link, the days outing to the RadioFest can also provide entertainment for the whole family through the wide range of nearby tourist attractions.

We look forward to seeing you all on Sunday 29th November, starting at 9.30 am. For further details or table booking information refer to the advertisement in this issue of *AR* magazine or go to the SPARC web site: *http://rosebudradiofest.com*

73 from VK3BSP, the Southern Peninsula Amateur Radio Club.

Tim VK3TJC.

Photo 2: Sarah VK3SD won the door prize.

VHF/UHF - An Expanding World

David Smith VK3HZ
vk3hz@wia.org.au

Weak Signal

Normally I write about propagation of note that happened in the month prior to the magazine deadline – in this case September. Unfortunately, and not all that surprisingly for early Spring, nothing of note happened in September.

However, with my usual tardiness, I'm finishing this off a few days past the deadline and into the month of October, and there certainly has been propagation of note over the last few days. So, rather than wait another month, here goes.

The Hepburn predictions had been showing a large patch of yellow / orange / red from the southern VK4 / northern VK2 coast all the way to the ZL north island as shown on Figure 1.

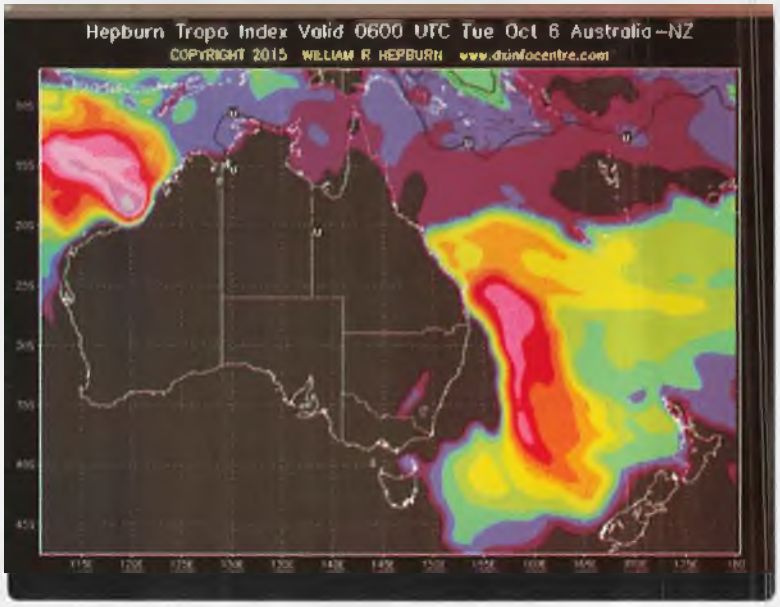


Figure 1: Hepburn Propagation Forecast for 06/10/15.

Sure enough, on October 3rd, the bands opened up and over the next four days (to date – it's still going), many good contacts were had from VK to ZL on 2 m, 70 cm and 23 cm. Rather than try to report on the stations involved, the following charts from the VK Logger for each of the calendar days provide a good overview of the activity. Note that the colours of the lines indicate the band – Re for 2 m, Blue for 70 cm, Pink for 2 cm, Green for Digi and Yellow for "Other" (e.g. FM radio). Also note

Figure 2: Spots for October 3rd.

Figure 3: Spots for October 4th.

gure 4: Spots for October 5th.

Figure 5: Spots for October 6th.

at not all lines indicate a contact – ome are for Spots only.

A number of 23 cm contacts ere achieved. Steve ZL1TPH ports working several stations om his portable location towards the top of the north island:

Today (6/10) worked VK4REX, VK4ADM, VK2MAX, VK2DVZ and VK2ZT on 23 cm. Highlights for me were three new VK stations on this band - VK4REX, VK4ADM and VK2MAX (have worked VK2DVZ and VK2ZT many times before). The VK4 contacts are my first and my best DX on 23 cm at 2310 km and 2308 km. With VK2MAX, we have been close in the past, but finally have done it.

My 23 cm (VK stations) contacts in total are now nine since 2003 when I first worked VK2DVZ. They are, in rough order, VK2DVZ, VK2ZAB, VK2KU/VK2TS/p, VK2FZ, VK2AMS, VK2ZT, VK4REX, VK4ADM and VK2MAX.

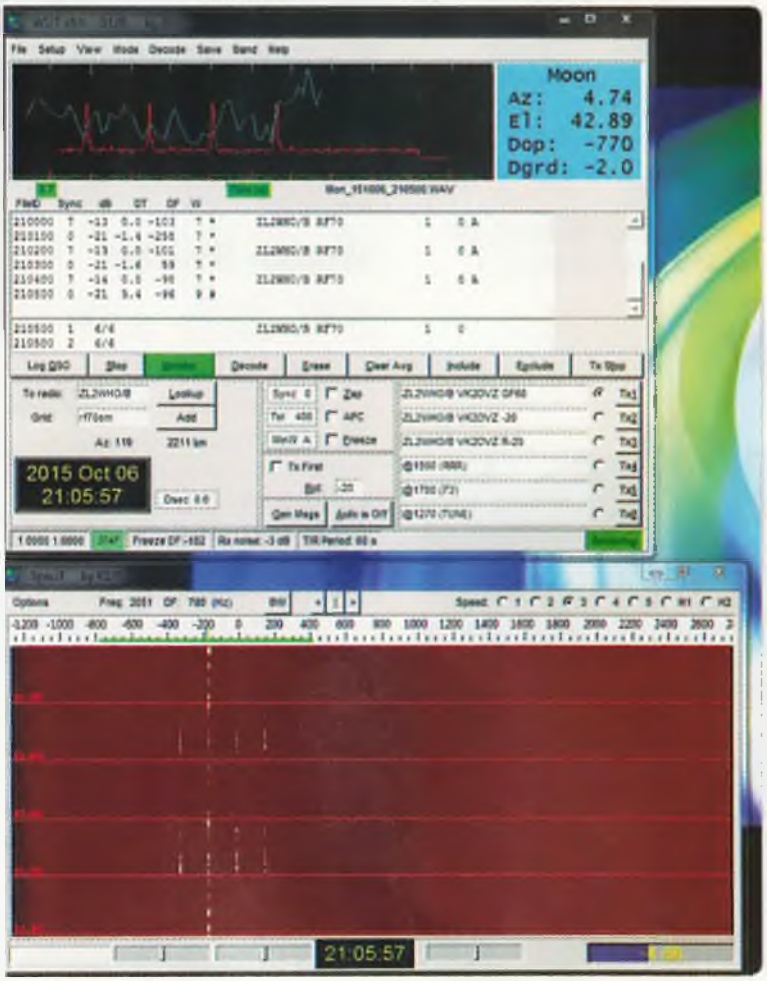
The VK Logger has helped immensely with these contacts so thanks Adam for providing this invaluable resource. Also the 23 cm activity sessions up in VK4 have helped greatly and produced results today.

Ross VK2DVZ gave Steve a 5x7 report and received 5x9. Then, on October 7th, Steve reported:

To add to my total, this morning I worked on 23 cm VK4AFL, VK4CZ, and VK4UH.

The ZL2WHO/B CW/JT4 beacon in the centre of the north island was booming through on 2 and 70. Rex VK4REX also received the 23 cm signal, even though the two panel antennas used on the beacon point north and south to favour ZL and place him well off the main lobe. Ross VK2DVZ, who is almost in a null for the beacon antenna, also had no troubles receiving the beacon, peaking to –11 as seen in the WSJT screen dump on Figure 6.

gure 6: ZL2WHO/B 23 cm beacon as received by VK2DVZ.



Plans for an additional west-facing antenna for the beacon are advancing.

The enhancement reached well south, and on the 6th, Rex VK7MO managed to get into the duct and join the action. At 0310Z, he worked Steve ZL1TPH (4x1) on 2 m. Then at 0610Z, he worked Nick ZL1IU (5x5) on 70 cm.

As can be seen from the Hepburn chart and from the maps of the 4th and 5th, New Caledonia also was covered by the opening. However, it seemed to be mostly a case of "lights on, nobody home". The FK8ZHA repeater was heard a number of times up to S7. There was a report that FK8CE worked into VK4 through the Bundaberg repeater (unfortunately on the same frequency as FK8ZHA).

The opening continues, so there may be more to report next month.

New VK2 76 GHz record

Matt VK2DAG and Justin VK2CU, with the able assistance of Dave VK2JDS, have been working hard on improving their 76 GHz equipment. Range testing over several months started with a few hundred metres, then 4 km, 16 km and finally, on September 26th, 39.7 km to set a new VK2 Record. Dave provided an excellent hilltop at his QTH in central NSW from which Matt operated.

The equipment used is DL2AM-based, with Khune local oscillators. Both transverters are dual 47 / 76 GHz which enables aiming on 47, and then hopefully they will roughly be there on 76.

Congratulations to all involved.

Microwave Enthusiast Award

Following on from his very successful "GPS-Locked Beacon" grants, Alan VK3XPD has announced at the recent GippsTech conference another initiative to support and encourage more VK activity on the Microwave bands.

The "Microwave Enthusiast Award" will be awarded annually to a VK Amateur who mentors and provides technical assistance to others through their knowledge and experience of microwave techniques. The winner of the award will receive a cash grant and commemorative plaque, provided by Alan.

Nominations for the Award will be requested and a peer group selected by Alan will decide on the eventual recipient.

More details may be found on Alan's web site at: *http://www.rfresale.com/ME.html*

Congratulations to Alan for establishing another exciting initiative to further encourage microwave activity in VK.

Photo 1: Matt VK2DAG at the QTH of Dave VK2JDS.

Spring VHF/UHF Field Day

Just a reminder to not forget the first VHF/UHF Field Day for the season. The Spring FD is on the weekend of 14/15 November commencing at midday AESST for the eastern states.

The bizarre situation of having two sets of rules for the one contest still persists. This means that two groups of organisers each have to wade through the results to determine the classifications for each of the Divisions. I would encourage all participants to only enter one of the Divisions so that the organisers can see what the majority prefer. Only then will we b able to settle the confusion.

Please send any Weak Signal reports to David VK3HZ at *vk3hz@wia.org.au*

Meteor Scatter

Dr Kevin Johnston VK4UH

I start this month by reporting the sad news of the passing of Waldis Jirgens VK1WJ who became a Silent Keyboard from the meteor scatter community this month. Waldis had been a stalwart of VK meteor scatter activity for many years, was a regular participant in the weekend activity sessions and a frequent contributor of reports to this column. Waldis and his XYL Sigrid were also frequent visitors t the annual GippsTech conferences In recent months, I have been collaborating with Waldis in metec scatter tests on 28 MHz and we h been planning to investigate lower frequencies still. With regret those tests will not be completed. I wish to pass on condolences from the

eteor scatter community to Sigrid.

In the September edition of *AR* I ade reference to a new version of e WSJT software package (v.10.0 639) with the addition of several w features for the ISCAT modes cluding shorter transmit cycles d "Auto Reply". Unfortunately, the production process of the agazine the labels on the two ures in the article became nsposed and the colour rendition the screen grabs is too dark to e clearly. I apologise for this, the ginals were much better.

Over the intervening period there ve been several more exciting velopments in both the WSJT and WSJT-X software suites relating meteor scatter activity. As has en reported elsewhere, ongoing velopment of both packages is w being undertaken by working oups across the world rather an exclusively by Prof Joe Taylor JT himself. One package now cusses on developments of the t modes (FSK441, JTMS, ISCAT, 9M and now FSK315) for meteor d ionospheric scatter etc., the er on the slow modes intended extremely weak signal work JT4, 9, JT65 and WSPR.

This month two new modes K315 and JTMSK have been ased for experimentation in teor scatter Propagation. To rify, JTMSK is quite distinct m JTMS mode which has been ilable for some time in previous sions of WSJT.

SK315

s new mode is available in WSJT sion 10.0 r.5755 (1.). This mode be considered as a "slowed wn" or "half-speed" version of more familiar FSK441 mode, ich remains the mainstay of VK operation at the current time. st of the encoding and decoding cess is identical to FSK441 K, four tones, at 315 baud), wever, running at the lower baud e, FSK315 has a lower overall dwidth. The intention, I believe developing this mode was to

	Meteor Scatter			Iono-scatter	
	FSK441	JTMS	JTMSK	JT6M	ISCAT
T/R Period secs	30	30	30	30	30
Modulation type	4-FSK	MSK	MSK	44-FSK	41-FSK
Keying rate (baud)	441	1378	2000	21.5	43.1
Bit Rate (bps)	882	1378	2000	----	----
Characters/sec	147	197	286	14.3	32.3
Bandwidth (Hz)	1764	1378	2000	947	1809

Table 1. Transmission Parameters of the "Fast Modes".

reduce the overall bandwidth of meteor scatter signals so as to comply with bandplan regulations for use in the USA "CW and Data" section of 10 m. I have had a brief opportunity to test out FSK315 on-air, as this article was being prepared, and have completed QSOs with Alan VK2ZIW (QF56hg) and with Peter VK5PJ (PF95mk) on 50.230 outside of the normal activity sessions. My impression from these early tests was that, although successful, FSK315 required more "blarp" than FSK441. Meaning that with FSK315 it appeared that longer and stronger pings were required to achieve a decode and shorter pings that one would anticipate would be sufficient in FSK441 gave nothing in FSK315 even on 50 MHz. In reality this is what one would expect. I have not had the opportunity to test the mode on 28 MHz but my initial impression is that FSK315 has little to offer us here in VK, where we are not faced with such bandwidth limitations as in the US, even for use on 50 MHz.

JTMSK

This is an entirely new mode, not to be confused with JTMS which has been available for some time. This mode has been specifically designed for amateur Meteor Scatter. It runs at the same signal levels required for FSK441 but at almost twice the character transmission rate and potentially makes much better use of short pings. MSK is an acronym for "Minimum Shift Keying" using continuous-phase FSK and achieving a high transmission rate with a narrow bandwidth and a constant envelope waveform. JTMSK uses FSK between two sinusoidal tones at 1000 Hz (0 bit) and 2000 Hz (1 bit) with characters encoded to 6 bits plus odd parity. Decoding employs real-to-complex Fast Fourier Transformation and strong Forward Error Correction. A comparison of the transmission parameters can be seen in Table 1.

Upgrades and bug-fixes have been appearing every few day or so as this article is being prepared. The early version tried here would only run for a few seconds before locking up my shack laptop and requiring a full reboot to restart. I eventually had success using version WSJT-X release 5924 (2) and was able to complete one QSO with VK5PJ and received decodes from VK2ZIW just before writing this month's column. It is likely that more releases will occur before this gets into print so I suggest anyone interested in having a try does a search around the web and on the forums for the latest stable version of WSJT-X at that time.

I will say however that those early tests were very interesting indeed; in fact Joe Taylor himself has suggested that JTMSK may well prove to be the replacement for FSK441 in the future. The "New Pretender to the Throne" perhaps? Although practice with this new mode has been confined to just a few QSOs, it was immediately obvious that there are some significant changes from FSK441 operating that have to be addressed. Firstly the current discussion supports the use of this mode with 15 second periods rather than 30 seconds. The reporting

structure is more akin to JT65 with signal levels i.e. -15 dB rather than the more familiar "26" and there is less flexibility and shorter allowable character strings to contend with which will make current practices like working multiple stations simultaneously problematic.

Neither of the new modes is compatible with FSK441. My plea to everyone is that while testing out these or any other new modes, they NOT be used on the primary MS operating frequencies 144.230 MHz and 50.230 MHz during the weekend activity sessions. This would just create untold confusion. My suggestion to everyone is to use the secondary MS frequencies 144.330 and 50.330 and coordinate via the band-appropriate I-Chat facility of the VK Logger. Another request also not to just QSY to 144.335 or 50.335 during the activity sessions when operating other modes, periods or timings. 5 kHz just isn't far enough away from the primary frequencies to allow near-by and high-performance digital stations to operate effectively without causing QRM or de-sensing to each other. Please move up the full 100 kHz to those secondary frequencies to ensure everyone gets a fair go.

It will be interesting to see what the future brings. If this mode turns out to have advantages over the current status quo then the meteor scatter community will have to adapt and come to some consensus as to how, when and where we operate these modes. Let us see.

The next significant meteor showers on the calendar are the Orionids expected to peak around the 22nd October (ZHR 25/hr) followed by the Leonids (ZHR 20/hr) expected to peak around 18th November.

References

(1) *http://jt65-dx.com/download/wsjt.html*
Select download WSJT version 10.0 rev 5755

(2) *http://jt65-dx.com/download/wsjt-x.html*
Select download WSJTX-1.6.1 Devel-r5924

Please send any reports, question or enquiries about meteor scatter general or the digital modes used Kevin VK4UH at *vk4uh@wia.org.a*

Over to you

Letter to *AR* editor regarding amateur licence fees

Dear Peter,

I would like express my complete support for the comments by Jim Linton and Roger Harrison in the WIA news item of 2 October 2015 regarding the issue of amateur licence fees and the suggestion by some amateur operators that we should not pay for our operating licence.

As the amateur service evolves it is essential that it continues to differentiate itself from other legitimate radio services and accept the rights and obligations that brings. One obligation is paying for access to the spectrum we use; we also have the rights of a legitimate radio service with respect to protection from harmful interference and unlicenced users. While the existing levels of protection may not be ideal, my view is that if we pay nothing, we can expect nothing in return from the Australian administration.

Australian amateurs, largely through the WIA, have the opportunity to comment on and influence the way the amateur service is run in Australia and how it fits with other users of the radio frequency spectrum. We run the risk of losing that opportunity if we fail to differentiate the amateur service from other users and pay our way as a legitimate radio service.

If we consider the cost of our amateur licence and compare it with a tank of fuel for our car, a dinner out or a couple of packets of cigarettes, the licence is really very cheap for what we get. To potentially lose the privileges we have for a small saving is very short sighted. That fee is really an investment we all make in helping maintain the future of the amateur service.

While not denying that there may be cases of financial hardship, one suggestion is that it would more appropriate for local radio clubs assist by assessing the situation and fundraising to help those in most need.

Thank you for the opportunity to comment on this issue.

Yours sincerely

Dale Hughes VK1DSH

CW Today

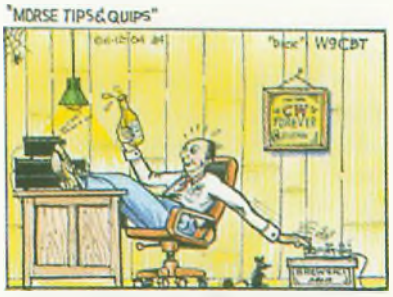
Louis Szondy VK5EEE
e *vk5eee@wia.org.au*

the first edition of *CW Today* ıblished in October issue of *nateur Radio*, we looked at the nefits of CW and some of the asons it is making a comeback as amateur radio communication ode of choice with many erators even being exclusively tive on CW. For others, CW is egular option for portable, low wer, rare DX only available on N or contests. This month we will ke a look at how old timers and wcomers alike can get on the air d find activities appropriate to ur various levels of ability.

eginners

ou are new to CW or don't know e "Morse Code" at all, you'll be eased to know that these days it easier than ever to learn. If you ve a computer, download free ftware by G4FON; a web search l easily locate it. The key is to use or just 5 or 10 minutes every day, that short term memory enters your long term memory. Learning orse once or twice a week with a e hour session is not the way to . It has to be a little, without too uch stress, and at least once a y.

In the past, many wrong ethods of learning Morse were ed, especially in parts of the estern world. Some big mistakes re to start learning too many aracters at once, and to learn em at such a slow speed that the nd thinks of dots and dashes d not the sound of dah-dah or h-di-dah etc. G4FON software es the right method of teaching u character by character at a oper character speed, but with



CORRECT POSTURE IS VERY IMPORTANT FOR SENDING MORSE CODE !

long spaces between the letters for you to think and remember. The program is also good for those who have already mastered CW but need more practice before going on air, simulating contacts with noise or fading etc.

Learning CW is like learning to speak when you were a baby. At first, distinguishing the sounds around you, and learning to mimic them, and experimenting yourself. Dada, Mama. Bay-bee. The more you learn, the faster the process accelerates and the easier it all becomes. Suddenly everything falls into place. The key to learning CW is to enjoy it, a little each day. Later, vary your experience by including some tuning around the bands or even better, with the online website Twente University SDR. This is because that receiver, free and easy to listen to in your web browser, is located in Europe which is awash with CW "rubber stamp" contacts and all speeds and styles of CW, hand sent, including electronic and semi-automatic bug keyers.

Old Timers

For Old Timers, those who are already fluent in the language and operation of CW, who may have tuned around the bands in years gone by and found them quiet and concluded that CW was no longer popular Down Under, here is some news. The Sunday morning CW Net on 7025 kHz between 10 am and midday Eastern Time had record check in numbers recently. It is a good place to brush up your skills, meet other old timers and speeds are generally 18 WPM or above. Also take a listen to the CW broadcast (QST) an hour earlier on 7022.5 or 14022.5 usually sent from VK4QC with 21022.5 for those outside Australia in the Pacific region.

If you would like to also welcome newcomers to the mode and assist them in having some practice QSOs, please be prepared to slow down for newcomers and tune around higher up the band. A good place to find both old timers, former professional radio officers and also those just starting out, is the national VK CW Calling Frequency 7050 kHz with a simple "3 rule" Code of Conduct: Keep calls short, no more than 3 calls per 5 minute period, and QSY after establishing contact.

Band Plans

The 40 m amateur radio allocation in Region 3 is from 7000 to 7300, with VK being one of the fortunate places to have the entire allocation, although we're very limited in our maximum power and antenna restrictions compared to all our neighbours.

The most recent Band Plan for 40 m recommended by the International Amateur Radio Union and adopted by the Wireless

Institute of Australia for VK radio amateurs has acknowledged the growth of CW and with an expanded SSB section as broadcasters vacate band. Consequently 7000-7060 is now CW with 7040-7060 shared with narrow band data modes. SSB is now 7060-7300. Many of our neighbours have only 7000-7100 total allocation although they are allowed much higher power for Advanced license classes. 40 m is the most popular VK-VK band at all hours, as shown in surveys such as that conducted online and published in the *Amateur Radio* August edition.

On 80 m we are not so fortunate with our government having allowed only 3500-3700 with an additional small DX window 3776-3800. IARU Region 3 recommendation, but not currently allowed for us in VK, is 3500-3900. The CW exclusive section is rather narrow at 3500-3535, though CW is allowed shared with data and SSB at higher frequencies, and the CW practice beacon can be heard on 3699 kHz as a marker of the upper edge of our 80 m band. For DX and day time of course 30 m, 20 m, 17 m and 15 m are popular, though there is still much less activity than in Europe.

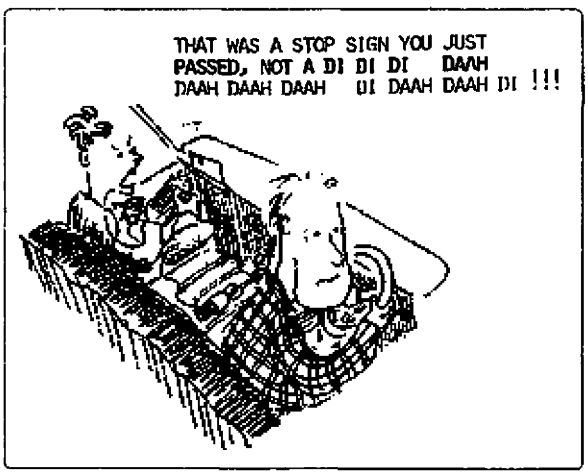
The bottom 10 kHz of each band are traditionally reserved for DX contacts. In the day time a contact between VK2 and VK6 would be considered DX on 80 m, but generally DX means long distance contacts beyond Australia. 25 kHz from band edge is traditionally high speed CW centre of activity. Slower speed CW takes place normally higher up the band between 40 and 60 kHz from band edge on most bands. Some of the popular QRP (low power) CW frequencies are traditionally 3560 (3530 in VK), 7030, 14060, 21060.

Crossing the Bridge

One of the obstacles to radio amateurs in Australia, aside from the small population density and thus much lower amateur radio activity on our bands is the fact that we all speak the same language, English. This means that "rubber stamp" QSOs don't really exist, and the jump from practising CW off-air to going on-air for those first QSOs is a daunting one. Someone is likely going to use long words in a "rag chew" telling you the details of the weather, his garden, or his rig set up.

In fact, in the past, many were those who only attempted one QSO and the experience was so negative or stressful that it was also their last. This is why a number of radio amateurs who love CW have all recently come together to look at solutions to make it easier for people to learn CW from scratch, to avoid wasting years with inefficient methods of learning, and to make the move to on-air QSO easy. The website VKCW.net provides much information to assist you in crossing the "great divide".

Once you are ready to go on air and venture into your first QSO (radio contact) on CW, having a copy of essential Q codes in front of you, and a short list of commonly used abbreviations in CW, the best way to go would be to venture into "rubber stamp" style contacts. This is more than a simple signal report or contest exchange but is a simple formula that will put you at ease and set the pace for your QSO partner.



First, set the pace. Send a CQ at a speed a little slower than you are prepared for someone to answ you at. If you can receive 12 WPM, send your CQ at 10 WPM. A good place to try out is around 7028 kH as this is the FISTS centre of activi frequency, one of the popular CW clubs that are very welcoming to newcomers. It is also in the part of the more popular 40 m band area used by slower speed, SOTA and QRP activities. Or you could call o 7050 then "QSY up 1" after you ge an answer.

Rubber Stamp QSO

Here is the popular format of a "rubber stamp" QSO, which provides excellent practice, is easy to master and gives a lot of information in a fairly standard format. It also sets the pattern for the more experienced station whic may answer your call and will mak for a more relaxing and stress free QSO as you are less worried abou missing things. It is a good idea to copy this format down and use it a your own template, naturally using your call sign and that of your QS partner.

First, as mentioned earlier, you set the pace.

Find a clear frequency, and sen "?".

If no response, send "QRL?" this means "Are you busy (is this frequency in use)?".

If it is still quiet, is it safe to cal CQ.

If you use the 7050 Calling Frequency, you don need to ask if the frequency is in use, it is a calling frequency, you can just go ahead and call. Within VK since its launch at the end of July, no QSO have taken place there, so worry not, g ahead and call:

CQ CQ CQ DE VK5EEE VK5EEE VK5EEE K

If no one answers you, tune around a little in case anyo is off frequency, and if still

>thing, try calling again. If on the alling frequency do this no more an 3 times within 5 minutes to >nour the gentleman's code of >nduct established by some) m users thus far, but on other equencies you can make calls as ng and as often as you like. Once >u have a response, if it is on)50, answer thus:

K4QC DE VK5EEE QSY UP 1 K

ıen tune to 7051 and continue ; below, or if you were already on ıother frequency such as 7028, ere would be your first over in a ubber stamp" QSO:

K4QC DE VK5EEE GM (or GA, E) TNX FER CALL = (dah-di--di-dah) UR RST 579 57N 57N epeat 3 times, N is short for 9) = TH ADELAIDE ADELAIDE = OP r NAME) IS LOU LOU LOU HW? low do you copy me?) VK4QC DE K5EEE KN (over and please no ıe else break in). Thanks can be NX or TKS. FER is short for FOR CW.

Your 2nd and final "over" in a ubber stamp" QSO will look like is:

K4QC DE VK5EEE R (only send R you received all the information, herwise say "PSE RPT QTH? K" "PSE RST AGN? K") TNX PETER HR RIG 100W ES (& in CW) ANT DIPOLE UP 5M = WX SUNNY EMP 22C (optional weather info) = GE QSL VIA BURO (if you will be ending a QSL card) = TNX FER FB SO ES HPE CUAGN 73 VK4QC E VK5EEE SK

aturally if you received a poor port from the other station, you on't try to tell them all about the eather and can make your final er shorter than above.

After the other station sends eir final, you can just end with a dit-dit :-) All done, and by sending what was written out in front of you, and following the standard "rubber stamp" QSO format, you have appeared professional without any sweat. More tips are available under QRS and Tips menus on the VKCW.net website.

Essential Q-Codes

Every CW operator needs to know the three most important Q codes: QRT, QSY, QRL. If you hear QRT this means "stop sending" -- don't ask why, just stop if you ever hear this. Probably you are on a frequency already in use or disturbing an existing radio contact. Some of our bands are shared with other services on a secondary basis and we must not cause interference to them. QSY means "change your frequency". Again if you hear this, move off frequency or to the frequency given, e.g. QSY UP 1 means go 1 kHz up. QRL means "I am busy" or, more commonly, "this frequency is in use". To check if a frequency is in use you can use "?" at first (nice and short), then check again with "QRL?" or "QSY?". For a full list of Q Codes search "Q Codes" in Wikipedia.

In CW some of the most commonly used abbreviations are: ES (and), TKS, TNX or TU (thank you), FER (for), HR or ERE (here), HW? (how do you copy?), GM (good morning), GA (good 'arvo), GE (good evening), GN (good night), HI or HEE (laughter, never use HI to say "Hi!" always use on of the GM/GA/GE codes in CW!), 73 best wishes, 77 (adopted by some to mean "Best wishes and happy CW contacts, Long Live CW"), HPE (hope), QRS (please send more slowly), QTH (my location is), QSO (radio contact), SN (soon), GL (good luck), RPT (repeat), RPRT (report), FB (fine business, means nice), UFB (ultra-fine business, means super), VY (very). A web search will reveal more of the abbreviations commonly used in CW.

Helpful Clubs and On-Air CW Practice

There are now several clubs that provide help for people starting out in CW or who want to develop their skills. There are various nets in SSB with CW practice, and "Elmers" (mentors) willing to help out and mentor newcomers to CW. As times and frequencies change with seasons and volunteers come and go, by the time they are published here they may be out of date. For the latest up-to-date lists of nets and on-air CW activities please refer to the VKCW.net website.

Anyone interested in CW, assisting others, becoming more active or just keeping up-to-date on current activities would be welcome to join the site and make use of the forum to ask any questions, offer assistance, or share your experiences. If you have any CW news to report, or any opinions to express, do write in to me by email and I'll be happy to incorporate whatever I can within this column.

Next month, among other things, we will learn who really invented the "Morse code" that we are using today, International Morse Code, which is very different from the original Morse code. It may come as a big surprise, a clue: he was German. We will also publicize some of the CW activities, nets and clubs around Australia, look at the many different ways you can send CW and how to get hold of a Morse key at little or no cost.

73 ES 77 de Lou, VK5EEE

DX Talk

Nick Hacko VK2DX
e *vk2dx@wia.org.au*

DXing and home-brewing

I wonder whether the most famous violin maker, Stradivari, was also himself a virtuoso player? Dare I say: highly unlikely! During the peak years of his creativity, Stradivari made over 1,100 string instruments! One could imagine that such production output left him with no time to actually play his masterpieces.

He made them, they've played them - and while the master builder and master player collaborated on the same instrument, each contributed in its own unique way. Most would agree that life is unfair: it is simply too short to allow us to master more than one virtue.

It looks to me that amateur radio 'works' in the same mysterious way: some of us enjoy playing radios, chasing the rare ones, contesting or just talking to guy across the town or across the globe. Yet others seem to be exclusively interested in building their transceivers, amplifiers, antennas and all the other gear. For some strange reason, while the nature of our technical hobby alludes that we should all be equally good at both, we are simply not: the quiet and clever introverts (builders) and cheerful extroverts (operators) are happily sitting at the most distant points of the amateur radio spectrum. And you are right: the distinction between operator and constructor goes back to very infant days of radio; and it seems that for the past 100 or more years, those amateurs who were equally good at both building and using the radios are actually quite a rare breed.

Yet to me, being able to brag about your home built radio on air, or to work that rare piece of equipment you've put together with your bare hands is probably the ultimate enjoyment of our hobby.

I am not sure if an article in DX column would excite a builder to get on air. But I can at least hope that there is a DXer or two out there who occasionally does fire up a soldering iron and venture in the world of home-brewing (While the main radio is parked on 14.260 MHz).

And the truth is, thanks to the internet, eBay and Google, it has never been easier to 'get into building your own stuff'. Of course, some technical knowledge is a necessary requirement, but putting together a kit should not be a difficult task even for a novice builder. While for the most engineers, us, the kit builders, are mere 'component placers', no one can deny the fact that such activity serves a number of purposes: a successfully assembled kit would at least whet your appetite for a more complex project.

Soldering is fun, and so is component procurement: waiting for that hard-to-find part to arrive in mail is as exciting as awaiting a delivery of QSL card.

This winter, once again, I was bitten with that very bug: my fingers were itching to start (and complete!) yet another put-together project: a QRP SDR transceiver containing well over 900 SMD components. The ultimate goal: to work my first 100 DXCC with a home-made low power transceiver. At the time of writing this report, I am happy and proud to report that my radio is on air and that I've just worked my country number 82: RI1ANZ from Antarctica. Other 'cool' ones were entities like PJ4, FG, OX, ZS, E51, EX, XV, T30, VU - just to mention a few.

The QRP log now contains precisely 640 contacts, all 'made' with 5 watts or less. The predominant mode is digi (JT65) bu many contacts were on CW and a few even on SSB.

The build itself was great! While my workbench contains just a few basic tools and measuring instruments, I take my builds seriously.

This means I take my time; build in stages and whenever possible check each unit before progressing further. The build started with a rather large bare printed circuit board. The first step was assembly of a micro controller - a tiny 44 pin chip- then the USB unit.

Loading the boot file was a nerve-racking moment, but once th hardware was recognized by SDR software, I knew I was heading in the right direction. Local oscillator and some mini MOSFET switches required extra patience, but soon the receiver was up and running.

What a milestone that was! Low pass and band pass filters were a straight forward affair, the installation of few hundred bits in T section challenged my patience, bu the assembly of the amplifier and T/R switching were a piece of cake There is something magical about getting the preamp and ATT, CW monitor and mic amp working - all in the first go. The SDR software is a story in itself and I am still learnin how to get most out of my radio which does not have all the bells and whistles of the big commercial transceiver.

The learning curve is steep but the ultimate enjoyment is rewarding nothing beats that great feeling of logging them with your own, home-made radio.

The bottom line is this: if I can do it, you can do it too.

Find a project which matches your capabilities, and then push yourself just a bit further. You

ve nothing to lose: even if your st project remains dead on the nch, you will learn so much about ectronics. After all, as a licensed nateur radio operator, you have ery right and privilege to build, rn and have some serious fun, th on-air and off air.

litor's Comment: Nick, you must l us at least which radio it is that u have assembled, and perhaps me more details in a future lumn!

K2SSI OC-194

ave to admit I didn't see this one ming!

A few weeks ago, out of the ue, the phone at work rang - and the other side was the voice of excited VK2IR who was looking a CW operator to join the South litary Island expedition team. was an opportunity not to be ssed: OC-194 is a rare IOTA ich was last activated 21 years o. While the island is just few ometres offshore from Coffs rbour, the prospect of activating s island would be a rare event. 2IR and boys from the Hellenic dio Club have spent almost three ars organizing this effort and I felt ly privileged to be invited.

All the hard work was done: m obtaining the licence to stay the island, to organizing the licopter flight, down to 600 kg equipment consisting of four mplete lines of radios, each th its own antenna. With a true litary precision the expedition was ecuted in a professional manner d six enthusiastic operators ged 5,200 contacts in less than hours. We felt we could have ged even more if the HF bands re in a better shape.

15/10 m were dead for the st of the time, 20m was rather erage, so the bulk of the activity k place on 30 m and 40 m nds. During the short openings pileup was intense, the uipment performed flawlessly, d the four helicopter flights over azing Australian coastline was the story for itself. If you've worked VK2SSI you should be proud of yourself because it would take years until OC-194 gets again on air.

HARAOA team: VK2IR, VK2PN, VK2FM, VK2KAM, VK2FMAD and yours truly, as a guest.

Amateur dreams do come true

I was blessed to be introduced to amateur radio at the tender age of 12. I imagine that growing up in a small city in Yugoslavia was probably no different than growing up in a small town in Victoria or South Australia: we roamed around freely; there were no mobile phones or personal computers and if you wanted to learn something new, you would either have to find a mentor or spend hours in a public library.

Yugoslavia was neither East nor West; a country more socialist than communist where citizens enjoyed a fairly large degree of freedom.

School kids were systematically exposed to amateur radio and joining a radio club to learn Morse was a very cool thing to do. Our city club had a membership of 30 active operators. The equipment was mainly WW2 modified surplus but in the early 70s Yugoslavia was flooded with Japanese transceivers, mainly those made by Kenwood. I clearly remember spending many nights in front of the mighty TS-510 which even had a separate VFO. For many years, we only had a low Windom antenna. However that modest setup was a blessing: we were taught 'radio stuff' the right way: by chasing the rare ones with low power on low bands, exclusively on CW. My younger brother Brane soon joined the club, and so did my dad and mum!

I left Yugoslavia in my mid-twenties, settling in Sydney which soon became my new home.

However I never completely cut the ties with the old country. Last month I went back to setup a remote station in the corn fields of Serbia - in a quiet country side location with no man-made noise nor building restrictions. The foundation work started a few months earlier. By the time I got there, my brother had completed the setup of the rotary tower together with the full size 40 m Yagi on the top - the very antenna both of us were dreaming about as kids.

Despite the rather average summer condition, but thanks to quiet country location, 40 m band sounded more like 20 m. Working DX was easy - wherever I turned the beam there was someone to work: the US pileup was massive and

The antenna in Serbia.

would start two hours before East Coast sunset. Pointing the antenna to Japan was another source of joy: the big guns were peaking S9+20 dB and even the QRP and mobile stations were easy to copy. I think in a few short days I've worked every PY, LU and CE station who happened to be on the band. There was even a nice pile of South African stations, and being called by ZD7, C91 and other exotic African stations was just an experience you don't get on 40 m from Australia.

But the highlight was turning the beam to VK! From Europe, the only measure of how your new antenna performs is the number of VK and ZLs in the log. Europeans just LOVE to work VK.

My most memorable contacts were those with VK5FUZZ, VK4FAAS and VK3FPBI who runs low power and employs simple antennas. VK7CC was a beacon: his phased verticals perform like magic and was an easy copy even well after his sunrise.

VK3IO, VK2BJ, VK4PMM, VK3BY, VK2XZ, VK3NU, VK3WWE, VK3MEG, VK3AUQ, VK5HY and VK5XDX were pleasure to work - the path form the east coast was not an easy one especially during the European summer. VK6APK, VK6WC, VK6RZ and VK6AJ were the only West coast stations worked and all of them were much stronger thanks to 3,000 km shorter path. But probably the strongest signal on 40 m from down-under was one generated by Greg VK8HLF. Well done to all and once again, thank you for answering my CQ.

This morning, I am sitting comfortably in my home in Sydney while operating RTTY contest as YU7XX using the equipment physically located on the other sid of the world.

Yes, the ham dreams do come true.

WATCH OUT FOR ....

TX3X from Chesterfield Island.

Polish team on Seychelles S79SP.

Nicholas FT4XU from super rare Kerguelen Island.

YE3B from Bawean Island, OC-197 and Cayo Sombrero OC-089 IOTA to be activated by Venezuela group.

Of course, the big one will be the double trouble VP8STI and VP8SO expedition on South Sandwich an South Georgia in January 2016.

Happy DXing,
Nick VK2DX / YU7XX

Silent Key

Jack Spark VK3AJK

It is with great regret we record the passing of Jack Spark VK3AJK on 8th August 2015, ten days before his 85th birthday. Jack was born in Cobden in 1930. A child of the depression, he left school aged 14 to train as a cheese maker. He then moved to Heywood where he met his wife of 64 years Valda. They had five children, two girls and three boys. They then moved to Leongatha and then Moe in the days when every country town had a butter factory. Approaching retirement they moved to Lakes Entrance where Jack worked at the Fisherman's Cooperative and he could enjoy his other interest - fishing. A few years ago they returned to Moe to be closer their family.

Jack obtained his amateur licence in 1955 with no electrical or radio background. When television arrived in Australia in 1956, Jack was one of the principals along with George VK3HV of Telray Industries. They manufactured TV phased array antennas which they found to be far superior to Yagis in fringe areas. Many of them are still in service today. As an experiment they made an array from fencing wire and conduit and convinced the nuns at Sale Convent to let them put it on the flagpole on top of the convent. To the delight of the nuns, they obtained a good TV picture. After Telray, he continued to manufacture set-top indoor aerials, including using an injection moulding press he made himself. He was a very skilled self-taught welder and fabricator obtaining advanced welding qualifications in his late 40s as an interest.

In 1962 he was the first amateur I ever met and with his help obtained my licence three months later. Jack was a great lover of Quad antennas and in the 1960s was active mainly on 20 m with a quad at 20 m high. He made many towers including my own. He and Val even built their own double brick and tile house in Moe with immaculate brickwork and tiling and did much of the work on their house in Lakes Entrance.

He was a great experimenter, mainly with portable and fixed mobile antennas as he and Val travelled on holidays in a campervan. Many amateurs are using his wire 70 cm/2 m mobile antennas which he gave away at GippsTech.

In the 80s he confined his antennas to wire, and activities to mainly 40 and 80 m. He conducted daily schedules first on 80 m then 40 m with a number of VK2, VK3, VK5 and VK7 amateurs right up to the day of his death.

He was my friend and mentor for over 50 years and will be sadly missed by myself and all of his amateur friends.

Sincere condolences to Val, Cheryl, Debbie, Alan and Gary and families.

Vale Jack. Stan Platt VK3BAB.

Contributions to *Amateur Radio*

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

Your contribution and feedback is welcomed.

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

Email the Editor: *editor@wia.org.au*

About Hamads

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

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

ADVERTISERS INDEX

WIA Functional Committees

The WIA is a membership organisation with a very wide range of complex functions and member services. Core functions and services are administrative in nature (general administrative functions, membership services, examination and callsign management, financial etc...) and are performed by salaried staff.

Volunteers perform a diverse range of highly specialist functions (ACMA liaison, Frequency Co-ordination, Standards liaison, Interference issues, technical support and training and assessment etc.). These volunteers provide the majority of member services, however they have been loosely organised and often overstretched.

The new committee system attempts to structure the WIA's non-core activities into 10 broad functional areas, each comprising a team of volunteers under the direction of the WIA Board. This structure is intended to spread the workload on our volunteers, improve communications between members and the WIA Board, improve services to members, and encourage more people to become involved in the WIA.

WIA Committee Charters

Spectrum Committee

(Regulatory, ACMA, ITU, IARU, Repeaters & Beacons, Standards, Interference & EME, Monitoring Service)
Geoff VK3AFA, Phil VK2ASD (Director), Peter VK3MV, Roger VK2ZRH (Director), Brian VK3MI, Dale VK1DSH, Peter VK3APO, Richard VK2AAH, Gilbert VK1GH, Rob VK1KRM, Noel VK3NH, Doug VK3UM

- Perform all ITU and IARU liaison activities.
- Liaise with, and act as the 1st point of contact for, the ACMA.
- Advise the Board, and enact Board policy in relation to all radio communications regulatory issues and the LCD.
- Represent the WIA to State and Local Government
- Represent the WIA to Standards Australia
- Provide specialist technical advice and coordinate repeater and beacon licence applications and frequency allocation.
- Develop responses to significant and prolonged harmful interference issues affecting amateur radio operations.
- Provide an information resource for EMC/EMR issues.
- Administer the IARU Monitoring Service in Australia
- Provide a technical resource to other committees and the WIA Office.

Technical Advisory sub-Committee (Tech support, Band plans etc.)

John VK3KM, Doug VK3UM, Rex VK7MO, Paul VK5BX, Walter VK6KZ, Barry VK2AAB, Bill VK4XZ, Peter VK3PF, Paul VK2TXT, Peter VK1NPW, John VK1ET, Peter VK3BFG, Eddie VK6ZSE, Peter VK3APO

Administrative Committee

John VK3PZ (Treasurer), Greg VK2SM (Assistant Treasurer), David VK3RU (Secretary), Mal VK3FDSL (Office Manager), Phil VK2ASD (President), Chris VK5CP (Vice President)

- Responsible for the efficient and correct operation of the WIA office.
- Responsible for staffing and workplace safety.
- Provide a specialist administrative resource to the WIA office as required.
- Manage contractual agreements.
- Manage business relationships.
- Ensure compliance with the ACMA Business Rules
- Prepare yearly budgets
- Prepare quarterly financial reports for the Board
- Prepare independently reviewed YE financial reports and balance sheets for circulation to the membership prior to each Annual General Meeting.
- Manage insurances and to be responsible for currency of insurance policies.
- Maintain a complaints register.
- Ensure complaints are handled in accordance with WIA policy and any contractual agreements.

Communications, Marketing, Publications and AGM Committee

Robert VK3DN (Director), Phil VK2ASD (Director), Jim VK3PC, Graham VK4BB (Broadcast), Roger VK2ZRH (Director) Publications sub-Committee (AR Magazine, Callbook etc): Peter VK3PF (Editor AR), Peter VK3PH (Editor Callbook), John VK3PZ (Treasurer), Ernie VK3FM, Peter VK3AZL, Evan VK3ANI, Ewan VK3OW, Bill VK3BR

- Communication with members and the public:
- Communicate with the membership.
- Publicise WIA activities and initiatives.
- Develop strategies and resources for the promotion of Amateur radio to the public.
- Develop strategies and resources for the promotion of WIA membership to the Amateur community.
- Supervise and/or perform promotional activities.
- Co-ordinate the yearly AGM activities

Education Committee

Fred VK3DAC (Director), Owen VK2AEJ, Ron VK2DQ, Mal VK3FDSL (Office Manager)

- In association with the WIA's RTO and affiliated clubs offering training services, develop and administer the WIA's training and assessment systems.
- In association with the Spectrum Strategy Committee, develop and maintain the various licence syllabi and associated question banks.
- In association with the Community Support Committee and the RTO, develop and maintain the Emergency Communications Operator scheme.
- Ensure the confidentiality and security of all personal information, question banks and examination papers.

Radio Activities Committee

Chris VK5CP (Director), Geoff VK3TL

Contests sub-Committee

Alan VK4SN, Denis VK4AE/3ZUX, John VK3KM, Tony VK3TZ, Kevin VK4UH, Colin VK5DK, James Fleming VK4TJF

Awards sub-Committee

Bob VK3SX, Marc VK3OHM, Laurie VK7ZE, Alan VK2CA, Alek VK6APK, David VK3EW, Paul VK5PAS, ARDF sub-Committee: Jack VK3WWW, ARISS sub-Committee: Tony VK5

- All activities associated with actual radio operation, such as: contests, awards, distanc records, QSL services, ARISS, AMSAT, ARDF

QSL Card sub-Committee

Geoff VK3TL, Alex VK2ZM, John VK1CJ, Max VK3WT, June VK4SJ, Stephan VK5RZ, Alek VK6APK, John VK7RT, Craig VK8AS

Historical and Archive Committee

Peter VK3RV, WIA Historian, (Leader), Drew VK3X Linda VK7QP, Martin VK7GN, Ian VK3IFM, Will VK6UU, David VK3ADW, Jennifer VK3WQ/ VK5ANW, Roger VK2ZRH (Director)

- Develop, maintain and preserve the WIA's historical and archive collection
- Encourage access to the collection by WIA members and those seeking historical mate for publication.

IT Services

Robert VK3DN (Director), Tim VK3KTB

- Provide an IT resource to other committees and the WIA Board.
- Be responsible for the off-site data back-up all IT systems information.
- To update and maintain the WIA website as required.
- Advise the Administrative / Financial committee in relation to the MEMNET Cloud Service contract.

Community Service Committee

Fred VK3DAC (Director), Greg VK2SM (Assistant Treasurer), Ewan VK4ERM (Director), Paul VK5PH

- Develop, promote and co-ordinate all WIA community support activities

New Initiatives

Phil VK2ASD (Director), Robert VK3DN (Director), Roger VK2ZRH (Director), David VK3RU (Compar Secretary)

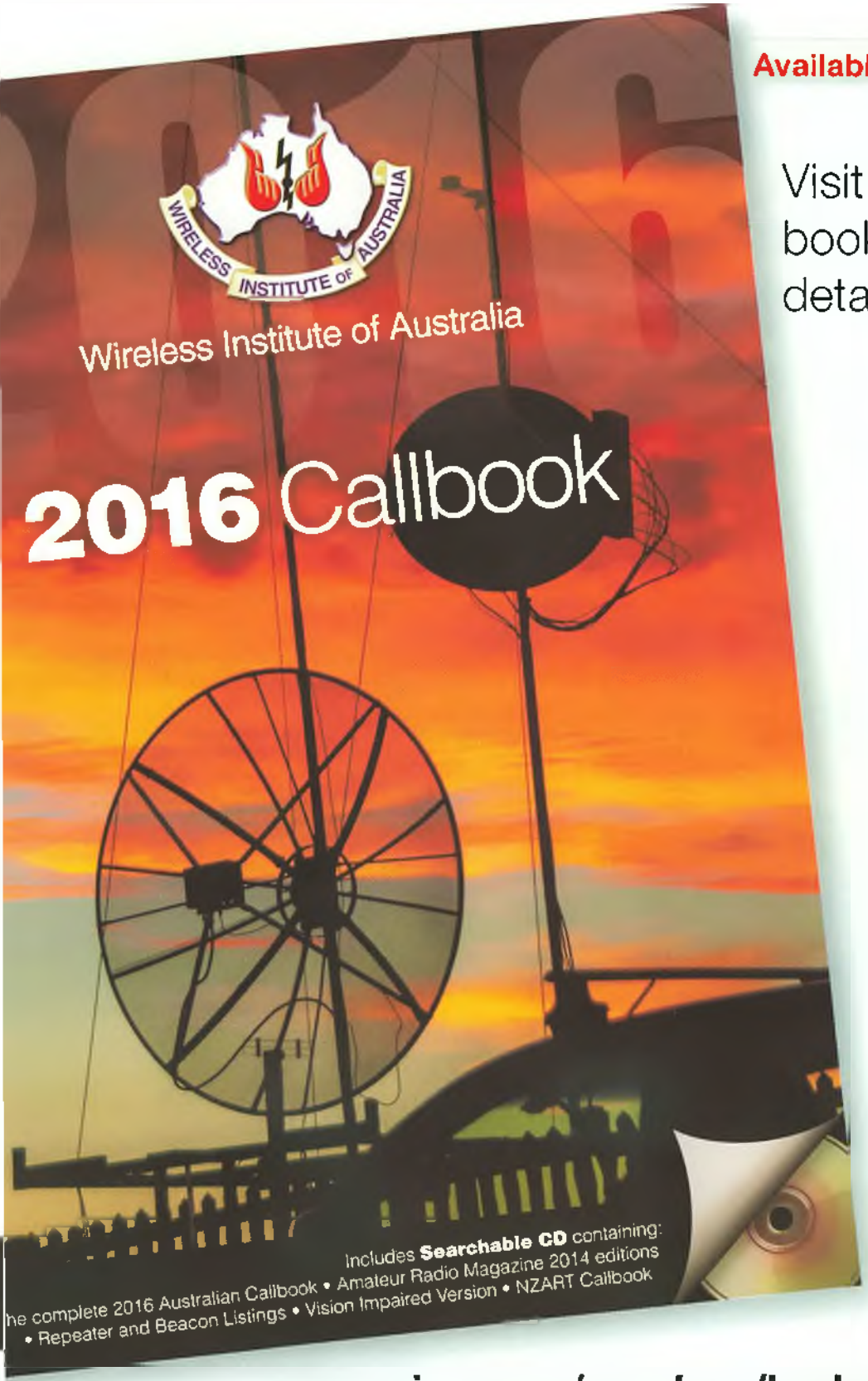
- Think-tank ideas and initiatives to advance amateur radio and WIA membership.
- On approval by the Board, run proof of con trials.

Affiliated Clubs Committee

Ted VK2ARA, Mal VK3FDSL (Office Manager), John VK3PZ (Treasurer), Phil VK2ASD (Director)

- Manage all arrangements between the WIA and WIA Affiliated Clubs
- In cooperation with the Administrative / Financial committee, manage the Club Insurance Scheme
- Encourage stronger relationships and communications flow between the WIA and WIA Affiliated Clubs
- Encourage increasing WIA membership rati in Affiliated Clubs
- Manage the Club Grants Scheme
- Identify and bring regional Affiliated Club issues to the attention of the WIA Board.

WIA **2016** Callbook



Available in November

Visit our online bookshop for details.

www.wia.org.au/members/bookshop/about/

ICOM

D-STAR

CONTINUOUS INNOVATION IN AMATEUR RADIO

IC-7300

IC-7851

D-5100A

IC-51A PLUS

IC-7100

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

WWW.ICOM.NET.AU