Amateur Radio

Volume 81
Number 5
May 2013
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John Moyle Field Day

Reports from the field

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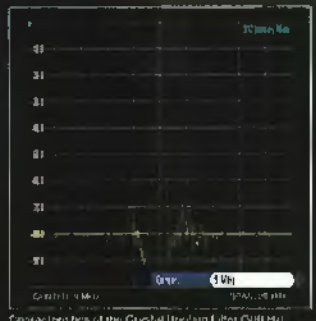

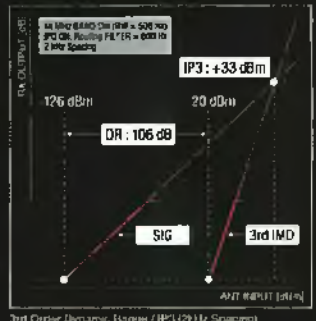

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General

This month's cover

Our cover this month shows an overview of the station of VK3JNH operating in the Alpine National Park during the John Moyle Field Day. The inset shows a view of the operators during the event. See the story on page 6. Photos by David Warrillow.

Technical

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.

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

Amateur Radio Service

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

Wireless Institute of Australia

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Editorial

Peter Freeman VK3PF

Conference time approaches

Late this month will see the 2013 WIA Annual Conference Weekend, including the Annual General Meeting, to be held in Fremantle. For the first time in several years, we will see the announcement of the results of an election for Directors. This is a sign of a healthy organisation, in my humble opinion.

Unfortunately, work commitments will prevent me from making the trip to VK6. I have not heard any news regarding the number of people who have registered to date. Both the formal and partners' programs look to be very interesting, so I am sure that all who do attend will have a terrific time. I am sure that all involved in VK6 will put on terrific events. Look at the inside back cover of this issue for details of the web site, where you can find further detail and submit registrations on-line.

Unfortunately, the timing of the event means that we are unlikely to have news for inclusion in the June issue of *AR* – July is possible if we get some reports in immediately after the event.

SOTA progress

We have our second SOTA contribution this month, which focusses upon some basics about being a Chaser. You will see that anyone can be a Chaser – just work the Activator who has made the effort to be on a SOTA summit!

You will also see that I have reached 1000 points as a Chaser, so can now claim the title of *Shack Sloth*. I have not sat down to analyse my logs, but many of those points were earned from portable locations, with many whilst I was on SOTA summits. I can report that a second VK operator has reached this milestone, with another not far from the milestone, but I am sure that Allen and Bernard will report these achievements next month.

SOTA activity continues to grow, aided by the efforts of the Activators in VK1 and VK3 in particular. As conditions cool down and fire risk diminishes, more Activators are venturing into the hills. The SOTA Australia Yahoo group has recently had some interesting exchanges about the planning undertaken by Activators, but this will be reported in the SOTA column next month, so I will not pre-empt the issues raised in the on-line exchanges.

Slip up

Last month, we published an article *Construction of VHF and UHF beams – A simple way* by Phil Derbyshire VK2FIL. Unfortunately, Phil became a Silent Key in late December 2012, as announced in the March issue of *Amateur Radio* (p 59). Unfortunately, all involved in the production of *AR* missed that Phil's article was still in our system and we neglected to note that Phil was now a SK.

We offer our apologies to the family and friends of Phil for this oversight. We request that no readers attempt to make contact with the author or his family for any further details regarding the article.

Until next month....

Cheers,

Peter VK3PF

WIA comment

Phil Wait VK2ASD

Clear policy needed on equipment possession

As part of my real job, every couple of years I attend the Spring Hong Kong Electronics Fair, the world's biggest, held at the at the Exhibition Centre overlooking Honk Kong Harbour. I also visit the Global Sources Electronics and Components Show held at the same time at Hong Kong Airport.

To say both these shows are huge is an understatement - three or four thousand exhibitors and each taking days to navigate around. I've been going to these shows now for about 30 years, but what particularly struck me last year was the number of manufacturers of locally made hand-held amateur radio equipment. Where only a few years ago there was maybe one or two, last year I counted over 30 different exhibitors, all with volume ex-factory pricing around US$20-40.

Most of these hand-helds were 'open', that is, not restricted to amateur radio bands, and clearly intended for both amateur and commercial use. One manufacturer proudly pulled out a D-STAR copy, and I believe HF models are well on the way.

It's little wonder that back home in Australia the ACMA is taking more than a passing interest in "open" hand-held transceivers imported from China. Recently ACMA inspectors have been inspecting amateur stations, and in some cases confiscating equipment or issuing Warning Notices under Section 47 advising that possession of equipment (Commercial Non Standard Devices) was not authorised by the station licence.

In a letter to one of the affected radio amateurs, the ACMA states:

"Amateur Radios are designed and limited to cover internationally recognised amateur radio bands only. Equipment manufacturers such as Icom, Yaesu and Kenwood have been producing Amateur Radios for over 50 years on these bands. Amateur radio equipment operating within Amateur radio bands does not have to meet Australian equipment standards.

"However, if a radio communications device covers commercial frequencies, or has been modified to cover commercial frequencies outside of internationally recognised amateur bands, then it must meet the standards for equipment operating in those bands, as well as carry the appropriate regulatory compliance marking (RCM), such as a C-Tick. Associated power supplies and plug packs must also be tested to Australian standards and carry a C Tick or RCM".

The possession and operation of old/ex-military equipment provided it use is within the Licence Conditions Determination (the LCD) is not at issue here as there is no Australian Standard in place for military equipment.

However, in practical terms there does not seem to be much difference between an amateur possessing a hand-held radio capable of transmitting from 400 – 480 MHz and say a Collins ART13 general coverage HF transmitter. Both are capable of wreaking havoc on other radio communications services, but only if the operator chooses to ignore the LCD and break the law, for which there are strict penalties.

To make matters even more complicated, as there is no Standard for amateur equipment in Australia, amateur licensees (except for Foundation licensees) are permitted to modify ex-commercial equipment for use on amateur spectrum, therefore rendering the device as non-standard. However, because the transceiver is then made non-standard, but still capable of transmitting outside amateur bands, it is illegal to possess it. Catch 22.

It is not clear whether or not modifying software/firmware for programming purposes is a modification or not, but I suspect it would be.

So, where do we go from here? It is clear that ACMA inspectors need to be vigilant about equipment Standards in the light of the new wave of low-cost products. In the past ACMA inspectors seemed to take a fairly pragmatic view in a situation where no clear policy exists, but now some amateurs are being deemed as acting illegally in possessing a device even though the device is being operated in accordance with the LCD.

The WIA believes the ITU definition of amateur radio, and the definition under the Radcom Act 1997, should be the foundation of a policy that a licensed amateur - of any grade - may possess any radiocommunications technology without fear of confiscation or any other penalty, simply in satisfying their non-pecuniary interests under the definition of Amateur Radio.

Continued on page 5

WIA news

New WIA Awards Spreadsheet

After some excellent work undertaken by Marc Hillman VK3OHM the WIA Awards spreadsheets will now accept ADIF format log file uploads.

The IARU Worked All Continents (WAC) award can now be applied for by WIA members through the WIA Awards program. The card checking and certification is carried out by the WIA Awards Manager and the certificates are issued by the WIA under agreement with the ARRL Awards Branch. This means that cards no longer need to be submitted overseas for this award - a first for the WIA!

This is an excellent introductory award for DXers as only six contacts are required (one in each continent). There is also available a 5 Band WAC and various other endorsements that can be gained for the more serious DXer! The new spreadsheet has been overwhelmingly successful it has reignited much interest and enthusiasm with many new applicants for the WIA Awards.

Marc Hillman VK3OHM delivered a presentation of the new awards spreadsheet at the March club meeting of Melbourne's Eastern and Mountain District Radio Club. The presentation was videotaped by Shaun Stoddart VK3FSDS and can be viewed from the link contained on this news item on the WIA website.

Thanks again to Marc Hillman for both his work on the spreadsheet and for his presentation.

Floods in Argentina

Record flash floods have killed several dozen people and destroyed thousands of homes in the Buenos Aires Province, Argentina, that suffered its heaviest April rainfall since records began in 1906. On Saturday there was heavy traffic on the 40 metre band, coordinating communications between the Radio Club La Plata and other areas who were sending food, clothing and other items to the flooded area.

Jorge Sierra LU1AS of Buenos Aires reports that relief efforts are being coordinated by radio clubs that have played an important role during the disaster. Net Control Stations were local radio clubs who told of road closures, the location of the collection centres in the area and planned transportation and reception.

The province's capital of La Plata was badly hit. The frequencies used are 7070 and 7120 Hz, with activity by Emergenciaslu Amateur (Amateur Radio Emergency Service of Argentina) plus VHF and UHF repeaters maintained by the Radioclub La Plata LU8DZE. Communication was helped by the use of the Internet, email and SMS which made it easier to locate someone or make it known that radio support was available.

Safe drinking water and power supplies were the immediate concerns for the affected people, with the media reporting half of the homes in La Plata were under water and the damage bill was estimated at $5 billion. The storms drenched Buenos Aires on Monday and Tuesday last week then torrential rain fell on La Plata during a two-hour period one day later, knocking out phone and power lines. The flooding turned roadways into raging rivers.

Jorge LU1AS expressed thanks for keeping the emergency channels clear and being otherwise very helpful during the unfortunate event. Argentina has declared three days of national mourning.

ARISS in Operations Down Under

Christ the King Catholic School in Warradale, Adelaide enjoyed a link up to the ISS on Wednesday March 20. The contact was done using the ARISS telebridge network, a worldwide network of amateur radio ground stations that enable students to contact the ISS. The ground station selected for this linkup was IK1SLD operated by Claudio Ariotti in Italy.

Christ The King School had some very excited students waiting to ask astronaut Hadfield 15 questions, just as the Children from Mt Ousley Public School on Tuesday, March 15. Twelve students had been chosen to ask questions to Astronaut Kevin Ford KF5GPP who is the commander of the International Space Station. The conversations occurred while he was travelling at 27,000 kilometres per hour at an orbit height of 380 kilometres above the Earth.

The event took place with the assistance of the Illawarra Amateur Radio Society, working with ARISS - Amateur Radio on the International Space Station. The connection to the Space Station was performed by Claudio located in Italy, with the audio then passing through NASA's conferencing bridge to the school's auditorium. The Australian ARISS Co-ordinator Tony VK5ZAI was the moderator, initially chatting to the students and their families, explaining how the connection to the Space Station was achieved before handing over to Claudio to call the Space Station.

Even before Astronaut Kevin Ford came on-line, the gathered audience was impressed as these voices from all over the world were coming through loud and clear into their hall's speakers. The Space Station was expected to clear Claudio's western horizon at 07:34 UTC & almost to the second, a voice came out of the noise and within seconds was noise free. The students immediately started with some questions revolving around

radiation exposure, the risk of fire, how long does it take to train for the Space Station, through to some lighter questions like can you roll a dice in space and can you eat spaghetti with runny sauce!

The broadcast was linked to the VK2RMP repeater covering Wollongong and Sydney area while also being connected to IRLP and EchoLink via John AG9D in the USA who was also connected to the NASA Conference Bridge.

For confirmation of connection to the rest of the world, Wollongong's second 2 m repeater VK2RUW on 7300, was also relaying the Space Station conversation but from the EchoLink relay via VK2BGL. Notably, its transmitted audio was a full four seconds behind that of the direct feed from the school into VK2RMP, but this was to be expected after the audio relay had effectively been around the world a few times!

The event was a great success, with the students and families standing around for well over an hour afterwards taking pictures and discussing what they had just heard. Additionally, the local newspaper, radio station and also the WIN Television News covered the event, with Amateur Radio being mentioned many times during the event.

All involved can be justly proud in assisting this small school in the suburbs to be taken "out of this world!"

WIA comment

Continued from page 3

However if a radio amateur operates such equipment in contravention of the LCD, then the full force of the law should be applied.

In other words, we believe the focus should be on operation, not possession.

At the end of the day, most amateurs want to be compliant but find it exceedingly difficult to achieve this where the regulator cannot articulate a clear policy. This is a very grey area and it's not fair for anyone, inspectors or radio amateurs, to have to rely on an individual's interpretation of an undocumented policy.

Phil Wait VK2ASD
President

PS. Our long suffering Treasurer, John Longayroux VK3PZ, would like me to tell you that the 2012 Directors Report including the Financial Report has been placed in the Members Only section of the WIA website.

Technical Advisory Committee Notes

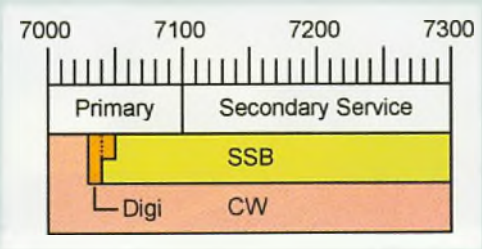
John Martin VK3KM

Changes to IARU Region I 40 metre band plan

After getting access to the band 7100 - 7200 kHz, IARU Region I have made changes to their band plan to provide more spectrum for CW and digital modes. The Region I CW segment now extends up to 7040 kHz, and the digital segment has been moved to 7040 - 7050 kHz.

This creates a possible clash because the digital segment used in Regions II and III (including Australia) is still 7030 - 7040 kHz, and frequencies between 7040 and 7050 kHz are commonly used for SSB operation. But stations in Australia making digital contacts into Region I now need to operate on 7040 kHz or above.

I suggest that we make a minor change to our band plan, to recognise the new Region I digital segment and to ask SSB operators to avoid operating below 7050 kHz where possible. The changes to the band plan would be as shown below.



7.000 - 7.300	CW
7.030 - 7.040	Digital data modes
7.040 - 7.050	Shared - SSB and digimode (IARU Region I digimode segment)
7.050 - 7.300	SSB
7.075	WICEN frequency
7.110	IARU Region III emergency centre frequency
7.130 - 7.150	WIA news transmissions

40 m band plan.

Team VK3JNH JMFD 2013

Stephen Warrillow VK3SN

Photo 1: Our station QTH, high in the Victorian High Country.

Mother Nature has quite a reputation for impacting on the John Moyle Field Day experience in VK3. In past years I've been in teams that have battled fierce heat, drenching rain events and have been nearly blown off mountaintops. I can report that true to form, 2013 also had some testing aspects.

Our (that is, Gerard VK3GT and the writer Stephen VK3SN/VK3JNH) usual location for the JMFD is high on an isolated peak not far from Mt Hotham in the Victorian Alps. This region has been severely affected by major fires in recent weeks and as a consequence, the area is currently closed to visitors. Instead, we headed up to the Snowy Plains region of the Victorian High Country. This part of the Alpine National Park is accessed via challenging dirt roads and is about a five-hour drive from Melbourne via the La Trobe Valley in Gippsland. Taking an off-road camper trailer allowed a few more modern conveniences and shelter to be brought along into this remote area. The Snowy Plains are at around 1600 metres elevation and gave good views to most directions. After arriving on the Friday afternoon, we set up camp and some of the gear in preparation for the Field Day on Saturday. At this stage, it was perfect weather, with bright sunshine giving a temperature of around 21 degrees.

Saturday was cloudy and cooler, with a strong breeze sweeping across the alpine meadows. Our sheltered position amongst snow gums provided a bit of protection and we were quite comfortable within the camper. Activity on most bands was down on previous years, but enough to keep fairly busy. As the day wore on, the weather became decidedly chilly and we continued working away until late at night.

Sunday was cold! It was -4 degrees in the camper and all the equipment outside was heavily iced over. Rain turned to sleet, which became snow, giving all outside surfaces a light dusting of white. Seems that Snowy Plains are so named for good reason! The batteries seemed to hold up fairly well despite very little charge coming from the solar panels and we finished at midday without problems. Packing up in the snow conditions was certainly challenging and it was good to finally be on the track downhill back to Melbourne.

Thanks to all the stations who worked us on the various bands during the 2013 Field Day. While activity certainly seemed less than past years, the enthusiasm and encouragement we received from the various portable and home stations we worked was greatly appreciated. Hope to work you during JMFD in 2014.

Photos by *David Warrillow*.

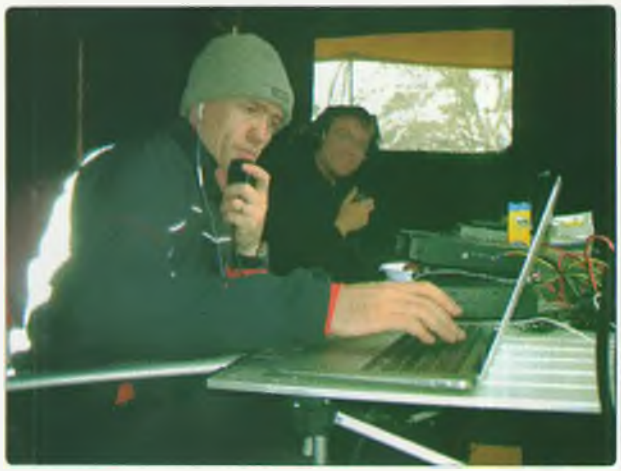


Photo 2: Gerard VK3GT on the left, and Stephen VK3SN/VK3JNH operating the JMFD in their camper trailer.

Build your own 'Screwdriver' antenna for portable or mobile use

Simon Freegard VK3UTE

Introduction

Enjoying mobile and portable HF operations, I have often been frustrated with the results when using conventional highly loaded whip type antennas, or having to go to the effort of setting up long wire dipoles. What I needed was an antenna that is quick to set up, easy to tune remotely and have the option to operate mobile if required. As I mostly operate 80, 40 and 20 metres this would be the design parameters.

After some research on line I came across several designs for a remotely tuneable 'Screwdriver' antenna, and in looking at these designs I thought what a fantastic way to combine two of my favourite pastimes, being engineering and amateur radio. Having a reasonably well equipped workshop and a little spare time on my hands (long service leave), I thought why not make one myself!

The antenna can be made with minimal expense and equipment, although access to a lathe will make for a quicker and more professionally finished product. Most of the materials required can be bought from your local plumbing supplies shop and a good electronics supplier. Actually I managed to collect most of the materials from my junk box and with the help of friends and family.

Description

The antenna is a centre loaded design consisting of three main components, the lower mast, loading coil and top whip section. The coil is adjusted traditionally by a cordless screw driver motor inside the lower mast, hence the name. The lower mast is thin walled tube and can be copper, aluminium or stainless steel of approximately 50 mm diameter, with the top whip usually a 2.44 metre CB whip trimmed to suit your required frequency range.

The loading coil telescopes up and down inside the mast as you tune up and down the required frequencies. When the coil is fully retracted the highest frequency is achieved, and vice versa, when fully extended the lowest frequency is achieved. (As the loading coil disappears into the mast it becomes electrically part of the lower mast and as such the shorted turns have no effect on the coil). Beryllium copper finger stock is fitted inside

the top of the mast to make the necessary electrical connection to the loading coil. The top whip length is nominal and you can experiment with different lengths for different frequency ranges.

The antenna typically presents low impedance, less than 50 Ω, at the feed point and as such some matching is required. This impedance will change with the frequency used so for optimal performance a multi tapped matching transformer is required (a unun). The tappings on the matching transformer can be remotely switched by local relays or manual switching can be fitted at or near the base of the antenna.

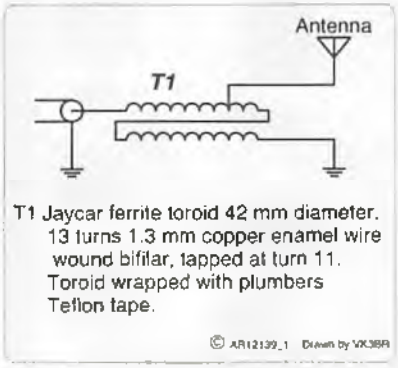


Figure 1: The unun.

Construction

The following description and drawings are my interpretation on how the antenna was made, most of which was dictated by what materials I had handy and what I could collect at no cost. As long as the basic measurements are kept close to those specified and the electrical principles followed the design can be adapted to suit what materials you have on hand. So get the junk box out and have a crack!

Lower mast

I used 50 mm copper water pipe for the lower mast; copper although expensive is easy to work with and readily available. Working in the construction industry I managed to acquire a couple of metres from our plumber. This was cut close to length then put in the lathe and faced off to a length of 910 mm. Once again the dimensions are not super critical. Make sure the length of tube you use has no dents and is clean and smooth inside as any blemishes will have an adverse effect on how the coil slides up and down. I also cut a short section of copper at 230 mm for the base which accommodates the mounting bung and made mounting and earthing the PL-259 connector easier; it also allowed some room for the matching transformer to be fitted inside the antenna, out of harm's way. A mild steel bung was pressed and bolted into the short section of copper and has a 12.7 mm (½ inch) Whitworth stud for mounting the finished antenna. Standard 50 mm brass plumbing fittings bushed down could be used for the mounting if you don't have access to machine tools. This short section is connected to the main mast by a length of nylon tube which accommodates the connector for the motor control wiring and provides electrical isolation.

Photo 1: The completed antenna.

Beryllium copper finger stock is needed to make the electrical connection from the lower mast to the loading coil. I managed to salvage some from a friend's collection of redundant medical equipment. Sitting in his back paddock I found a liposuction machine on which was fitted a huge capacitor the size of a milk crate! The connection to this capacitor was via telescopic brass tube running on finger stock which was perfect for the job. The finger stock

Photo 2: A view of the base mount.

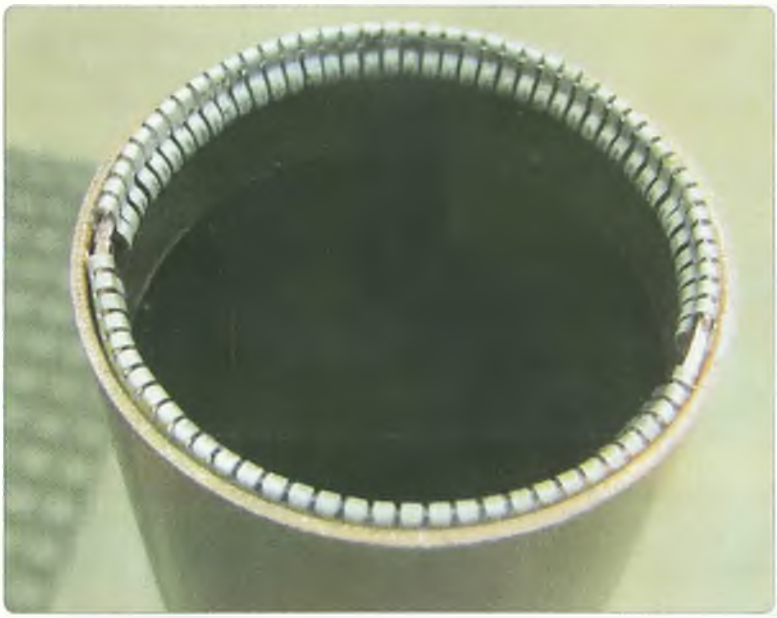


Photo 3: Finger stock fitted.

was de-soldered and soldered to the inside of the mast. If you don't have a liposuction machine lying around try one of the larger electronics suppliers or have a go at making some out of brass shim.

The coil

The loading coil is made from 32 mm Class '12' PVC pressure pipe cut to a length of around about 660 mm. I should have used Class '18' as it has a much thicker wall than the class '12', which is necessary for mobile operation. The coil needs 135 turns at 10 turns per inch (TPI); this is where having access to a lathe is a big help. The length of PVC was set up between centres and using a travelling steady, a 10 TPI thread was cut about 0.5 mm deep, locating the 1.3 mm copper enameled wire at the correct spacing.

The overall length of the coil needs to be 380 mm. The length of the coil and number of turns could be increased to allow operation on lower frequencies if required; don't be scared to experiment. If you don't have access to a lathe I have heard of brush cutter cord being wound alongside the copper wire to achieve the correct spacing and removed after the winding is complete. Once the coil is wound you will need to gently file or sand the enamel off the coil to allow the finger stock to make the necessary electrical connection.

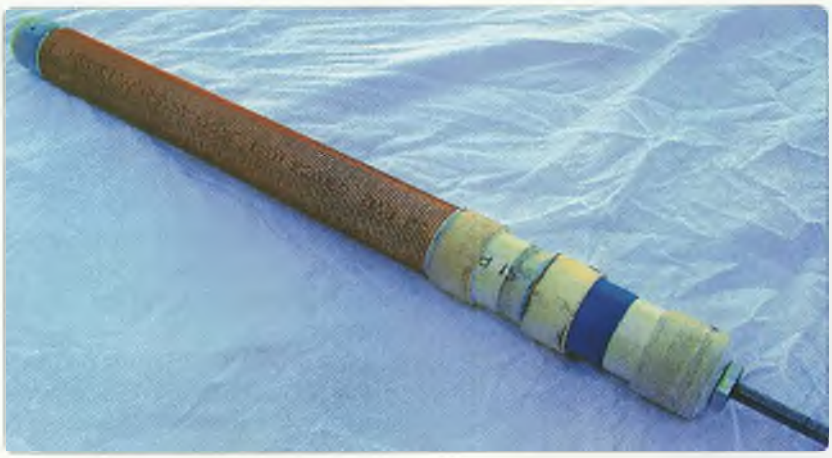


Photo 4: The completed coil.

A standard Class 12 PVC cap is fitted to each end of the loading coil using counter sunk screws drilled and tapped. Both the caps need to be removable for final assembly so try to avoid the temptation to use the blue glue. The top cap is drilled to accommodate a standard CB antenna mount to which the end of the loading coil is soldered. Once completed the stainless steel CB whip is fitted to this mount.

The bottom cap needs to be machined to fit snugly into the lower mast as it acts as one of the support bushes for the completed coil. This cap also needs to have a threaded nut fitted; once assembled this will wind up and down a length of threaded rod which is connected to the drive motor. I used a short 16 mm bolt through which I drilled and taped a 10 mm thread. This bolt was then bolted through the bottom of the cap.

Alternatively a 10 mm nut could be glued to the bottom of the cap using Araldite.

Finally two more support bushes will need to be fitted above the bottom cap. I used a 32 mm Class 12 PVC joiner cut in half and machined them down to fit inside the lower mast. This could be done with a belt sander, linisher or lathe. Using the three support bushes should make the coil strong enough to support the stainless steel whip. Assemble the coil and try it for size on to the lower mast. If all is well the coil should slide up and down inside the lower mast smoothly. Once you are happy the two upper support bushes can be glued in place. That completes the coil.

Motor drive

A small, high torque, low speed 12 volt motor is needed to drive the loading coil up and down. I managed to find what looks like some type of aviation servo motor in my Dad's shed (thanks Dad).

I see that Jaycar have several high torque low speed motors that would

Photo 5: The CB mount.

Photo 6: The completed drive assembly.

Photo 7: The motor close up.

Photo 8: The threaded rod travel limiter.

do the job perfectly, or you could opt for the traditional cordless screwdriver motor. The motor is fitted inside the lower mast where a length of 10 mm threaded rod is connected to the output shaft. Mounting obviously will depend on what kind of motor you can find; all I did was machine a nylon bush which fits snugly over the motor body and inside the mast. A countersunk screw was drilled and tapped through the mast wall into the nylon bush to locate the motor in its final location.

The length of threaded rod needs to be cut at the correct length to allow the coil to fully extend and retract, and this is best measured in situ. Some form of limiting system is needed to ensure the coil does not over travel. Traditionally this is done by either micro switches or current sensing on the supply power to the drive motor. Neither of these designs appealed to me as I wanted to limit any wiring or circuitry in and around the antenna. I opted to machine the thread off each end of the threaded rod so when the limit of travel is reached the coil simply winds off the end of the thread. A spring is fitted at each end of the threaded rod which applies preload to the coil once it drives off the thread. This ensures that once the motor is reversed the coil takes to the threaded rod immediately

This solution makes it impossible for the coil to overrun. When finished the threaded rod is connected to the motor using a short piece of 6 mm fuel hose and two hose clamps.

Control

Controlling the drive motor can be as simple as a double position double pole switch connected to the accessories socket in your car, or as complex as a SWR sensing circuit interfaced with the tuner control of your radio. I kept things simple and opted for the basic switch control to begin with; however I did fit an optical encoder to the driveshaft with the intention of fitting a counter or designing a PIC microcontroller for the job later on.

Most importantly the wiring to the drive motor needs to be shielded and some form of filtration provided to suppress noise from the motor. I used heavy duty microphone cable which is very durable and well shielded; two ferrite beads were fitted over the cables and the body of the motor earthed. I fitted another large ferrite bead to the external control wire which suppressed 90% of the noise.

Matching

Some form of impedance matching is required at or near the feed point of the antenna. This is a subject of much discussion and can be achieved many different ways. Access to an antenna analyser at this point will take out a lot of the guess work, as you can measure the impedance at each band and design the matching device to suit. I prefer the unbalanced to unbalanced transformer design as it provides a direct path to ground should the antenna hit power lines and will help reduce static build up on the antenna. I used a ferrite toroid with 13 turns wound bifilar tapped off at turn 11. This is a very crude solution and I hope to fit relay switched tappings controlled by a PIC microcontroller at a later stage.

This is a good time to mention the other half of the antenna, the 'ground'. This is an extremely important and often overlooked issue. In a mobile HF antenna installations RF grounding can have a dramatic effect on the efficiency of your antenna system. Wherever possible, braided earth straps should be fitted between bull bars and panel work, ute trays and chassis, and body work and chassis. Some operators go to the trouble of fitting earth straps between the doors and the body work and even to the exhaust system. Remember every bit helps especially when you think this antenna design may only be around

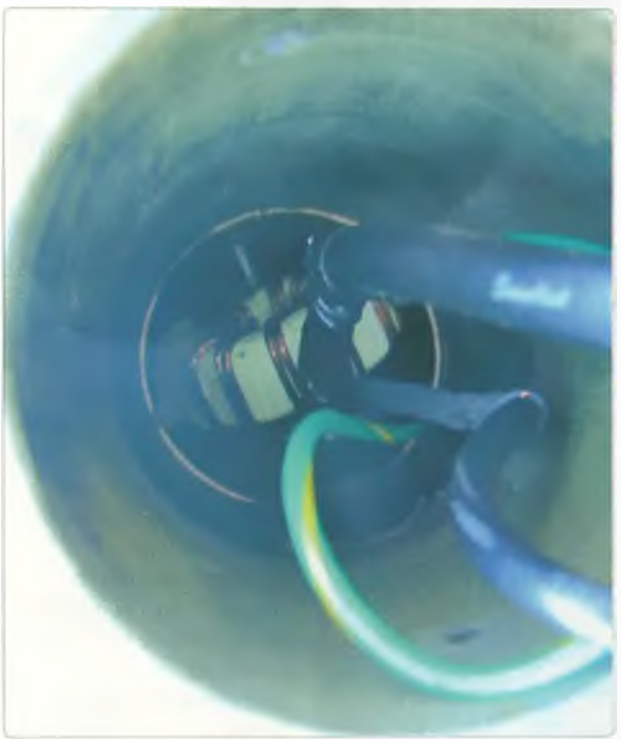


Photo 9: The unun in the base.

3% efficient, and of course the higher you can mount the antenna the better.

The braided strap shown in Photo 13 was fitted between the roll bar of my ute and the tray. This made one 'S' point difference on a weak two metre signal even though the two are bolted together! This to me is proof of the importance of RF grounding in mobile operation. Don't rely on factory fitted earth straps or bolted panels; they may be fine for DC grounds but not effective at RF levels.

Adjustment

Once you have the antenna assembled and mounted all there is to do is pick your operating frequency and while watching the S meter, motor the coil up or down until the highest reading is achieved. At this point the SWR should be very close to 1:1. Some small adjustment may be needed to achieve the lowest SWR. Experiment with different length top whips for higher or lower frequencies.

Finishing

To give the completed antenna a professional finish I applied several coats of good quality enamel paint and fitted a rubber boot over the loading coil. I managed to find a boot in my Dad's shed that was the perfect size. If your parents are not hoarders you could try your local motor cycle wreckers as some bikes have similar sized boots fitted to their front suspension. You could also use the next size up PVC pipe fitted to the top of the loading coil to protect it from the elements.

On the air

So far the antenna has worked well. Of course it will not compete with an 80 metre half wave dipole but it should perform better than most commercially available loaded whips. You get the satisfaction of using something you made yourself. I can sit in the car and hop from band to band with the press of a button enjoying contacts with friends.

So what are you waiting for? Head down to your local plumbing supplies store and have a go. You could even make it without the drive motor and move the coil by hand to keep it even simpler or fit a microprocessor controlled stepper motor interfaced with your radio, if you want a challenge. For my money homebrew projects are one of the most enjoyable aspects of this fantastic hobby even if it is just making a balun for a dipole. I hope you got as much pleasure reading this as I did constructing the antenna and sharing the experience with you.

First outing for my Elecraft KX1

Grant McDuling VK4JAZ

Saturday 16 March was an excellent opportunity for me to give my new Elecraft KX1 its baptism of fire.

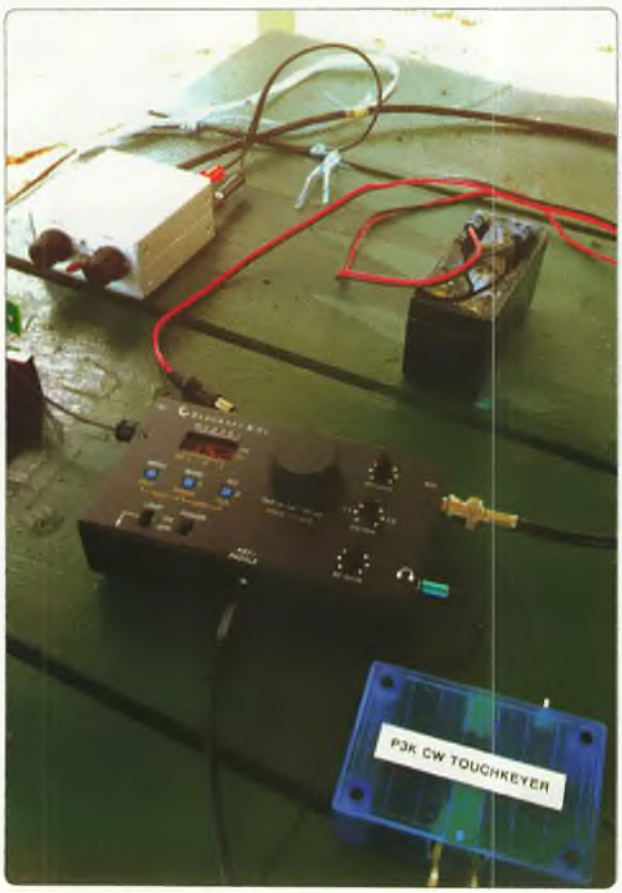
The occasion was the John Moyle Field Day, so I packed up my gear and headed for a nearby park.

I decided to use a long wire and counterpoise for an antenna, which I would tune up with my BLT tuner.

I haven't built and installed the automatic tuner yet; that is my next project.

I attached a heavy nut onto the end of a long piece of string, tied it to the end of the long wire, and threw it up across the branch of a tall gum tree. It went up first time. Talk about beginner's luck!

I had decided to also give my newly-built touch keyer a run. I only operated for an hour and made three good contacts. I was more than pleased.



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.

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The i-KAKTUSSS - an iambic keyer and Koch trainer using a seventeen segment screen

Erich Heinzle VK5HSE

Introduction

Are you a Morse operator? Perhaps you're currently learning Morse? Perhaps you're involved in education or Scouting and need a low cost but useful kit for students to assemble?

This project takes advantage of the simplicity and power of the latest generation of PicAXE BASIC programmable microcontrollers to combine a Morse keyer, Koch training, random Morse code generation, and Morse beaconing in a design that can be easily assembled at very low cost. In its simplest version only 28 components are needed on a single sided PCB or breadboard.

The i-KAKTUSSS is designed to allow easy customisation, with the user able to easily modify the BASIC code for enhanced functionality, modify the practice text, as well as add to the basic keyer's circuitry thanks to a deliberately flexible PCB layout.

What makes this keyer different to the others described to date is that it combines the functions of a fully electronic iambic keyer with immediate character display, thereby allowing various Morse training modes and, of course, use as an enhanced practice oscillator.

Why another keyer?

The motivation for this project came from my frustration with the difficulties encountered with traditional methods of learning Morse. The first difficulty is inconvenience, such as having to tune in to a broadcast at a certain time, or needing a computer to run Morse practice software. The next difficulty is inefficient learning. When listening to a practice CD or tapes, one eventually learns the sequence of characters over time, or the speed of characters isn't what you want, reducing its effectiveness. Ideally, one should hear the less well known characters more often, but this does not happen with a CD or standalone Morse trainer. When you do eventually hear one you're not sure of, there's never a code chart nearby. Finally, practice tapes often teach the letters separately from the international punctuation characters and numbers, making it hard to incorporate the longer characters into one's learning.

Unlike all other keyer designs previously published, this keyer will recognise the Morse character that has just been keyed, and flash up the character on the 17 segment alphanumeric display as immediate visual reinforcement for the operator after hearing the keyed Morse. It is hoped this will counter the tendency to count elements and thereby teach reflex recognition in those learning Morse.

PicAXE details

For those unfamiliar with the PicAXE, it is a family of microcontrollers based on the Microchip PIC range of microcontrollers which contain a built in BASIC interpreter and bootloader enabling really simple and cheap programming with a serial cable. No arcane compilers are required, and no expensive in circuit programming adaptors are needed. The programming is done in the BASIC computer programming language on any old (that is, hard refuse collection) desktop PC with a serial port and free software available from the website of the PicAXE developers at *http://www.picaxe.comwww.picaxe.com/*

This profound simplicity, along with comprehensive, free, and up to date online documentation is what has made the PicAXE so popular in the education environment, and is why no radio amateur able to program a radio should fear the PicAXE. USB programming adapters can be used on newer PCs without a serial port.

The 28X2 is a late model, 28 pin PicAXE microcontroller with built in support for touch sensors, PS/2 keyboard IO, serial IO, i2c, spi as well as analogue and digital IO generally on its 21 available IO pins, and can safely source or sink up to 200 mA in total. The newer PicAXEs can run on an internal oscillator, or can be externally clocked for much faster execution speeds.

The Morse keyer uses all of the available pins on the 28X2:

- two pins for Vcc.
- one pin for Vss.
- 17 pins for the common anode 17 segment alphanumeric LED display.
- two pins for the left and right paddle inputs, which can also be used for a PS/2 keyboard.
- one pin, which is also the programming serial out pin, is devoted to the sound output, which could also be modified for one-off keying of a rig with sidetone support either in the keyer software, or with the addition of an AF driven open collector transistor.

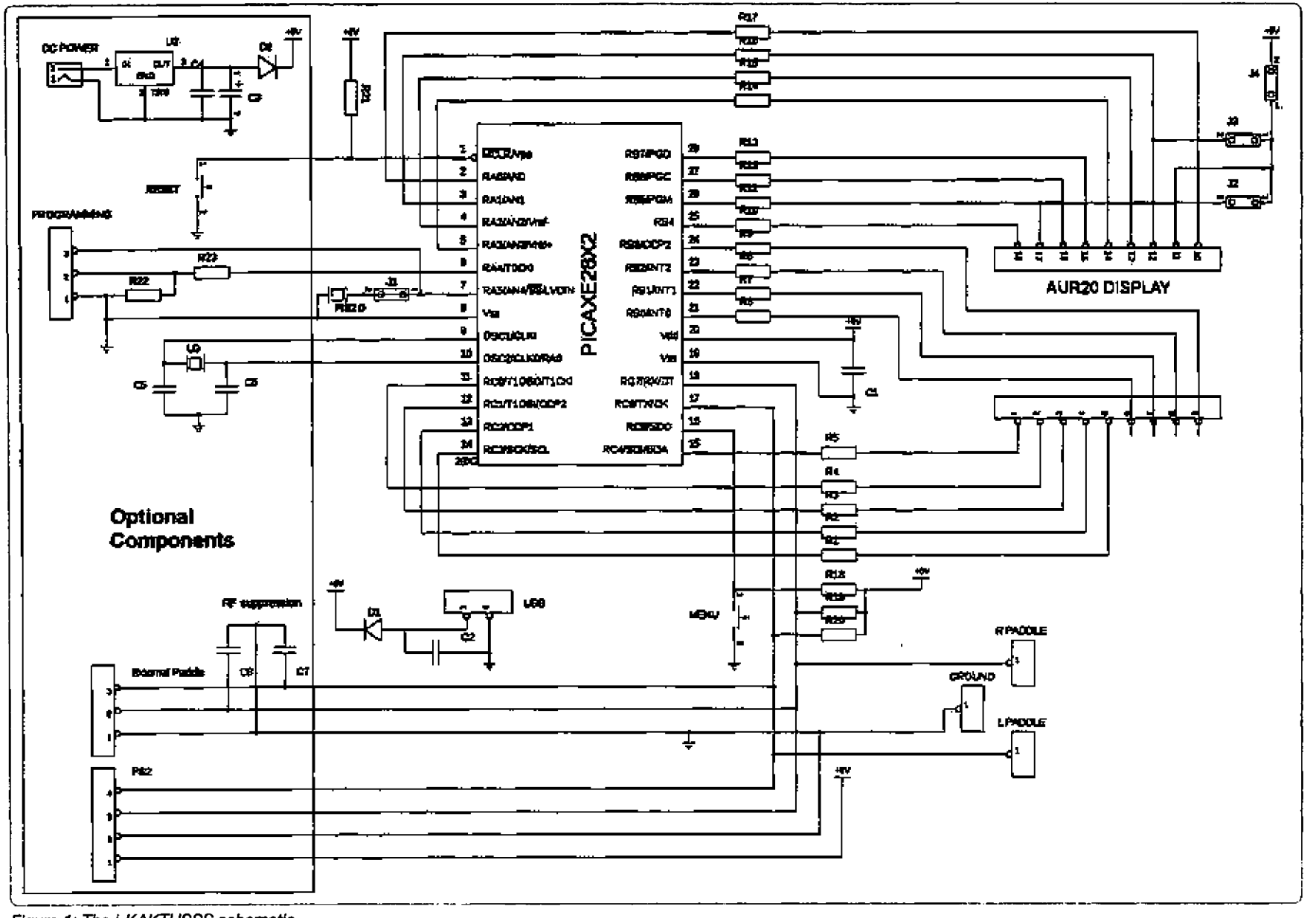

Figure 1: The i-KAKTUSSS schematic.

- one pin is devoted to a menu button to allow WPM, keyer mode and other settings to be changed.
- The two oscillator pins remain unused, but provision has been made for a crystal and capacitors if users wish to experiment with faster execution speeds.
- one pin is the reset pin and is tied to Vcc with a pull-up resistor – a switch can be installed but is unlikely to be necessary for routine use.
- The serial programming input pin remains available for programming.

Circuit Details

The circuit board has been designed with large landings to enable a simple paperclip paddle key to be built directly on the PCB with three mm machine screws and three paperclips.

At its simplest, a programmed PicAXE28x2, a decoupling capacitor, 21 resistors, a menu button, a cheap type B USB connector for power, a piezo speaker, a power diode, and the alphanumeric display are all that is needed for the circuit to operate.

Figure 1 shows the schematic with the optional components also shown.

The PCB has been designed to be exactly 76.2 mm (three inches) by 101.6 mm (four inches), so that those making their own PCB can easily scale the published PCB artwork, as shown in Figure 2, if necessary. As further assistance in confirming the PCB artwork dimensions, one cm spaced trackwork 'bumps' have also been placed along two edges of the PCB.

Circuit Assembly

Using Figure 3, which shows the component layout, start by installing the USB type B connector. After this, the 17 current limiting resistors for the alphanumeric display can be installed, R1 to R17. Constructors who are tempted to use older 28X1 chips should note that the 28X1 can only source or sink 95 mA safely, and the R1-R17 values should be changed to 560ohms, which will result in a duller, QRP display. After this, the pull-up resistors for reset, the menu button and the iambic paddles can be installed, R18 to R21. After this, the decoupling and smoothing capacitors C1, C2 and the piezo can be installed, followed by the reverse polarity protection diode D1, followed by the alphanumeric display, making sure the decimal point is at the lower right of the i-KAKTUSSS board. Before inserting the microcontroller, apply 5 V to the circuit with a live USB cable and check that +5 V is present at the 5 V pad under the microcontroller socket. Finally, the programmed PicAXE28X2 can be installed, ideally in a 28 pin socket.

If paperclips are to be used for a rudimentary keyer, they can be bolted to the left, ground, and right lands provided on the lower third of the circuit board. Alternatively, a 3.5 mm phono jack can be installed on the landings provided, or a header installed, for a lead going off to a dedicated set of paddles. Once 5 V is applied from a source able to supply up to 200mA, the i-KAKTUSSS is up and running as an iambic keyer, ready to display whatever Morse character you care to key in.

The software functionality

The code has been written in a modular fashion, making extensive use of labels, comments and subroutines for readability. Because of the limitations of the BASIC interpreter, the full functionality of the i-KAKTUSSS requires most of the available 16k of the program space across the four available program slots in the PicAXE28X2, but this is totally transparent to the user.

The software currently supports the following modes of operation, which are selectable with the menu button. The code is undergoing on-going development, and by the time of printing, should offer additional refinements. The latest version of the code, an online construction manual and usage manual, PCB artwork, i-KAKTUSSS kits, and support for kit builders can be found on the Adelaide Hills Amateur Radio Society website *http://www.ahars.com.au/*

When the menu button is pressed, the i-KAKTUSSS will cycle through various modes and options, and will select the last displayed option if the menu button is pressed.

A Morse keyer

The default i-KAKTUSSS mode of operation on powering up is as a Morse keyer. The software implements an iambic mode B keyer, similar to that of the discrete logic WB4VVF Accu-keyer described in older ARRL handbooks.

Gating of the next Morse element can be adjusted in software, allowing mode A or mode B keying, or something in between, to be selected. Those using a single paddle should not notice much difference between an iambic mode A or mode B keyer.

The WPM can be selected in the menus, and defaults to 20 WPM to encourage Farnsworth style learning. The default speed on powering up is easily changed in software if desired.

The keyer recognises and displays all the standard international Morse characters, and the eight dit error character. Invalid Morse element combinations are followed by an animated cross.

The software can be modified to allow the keyer to key a rig rather than sound a piezo if required.

Morse Training – Stored Text

The i-KAKTUSSS can continuously play stored text, which at present consists of most of the Q codes along with their definitions, as well as some other assorted text. This is easily changed in the software by the user to any text of their choosing.

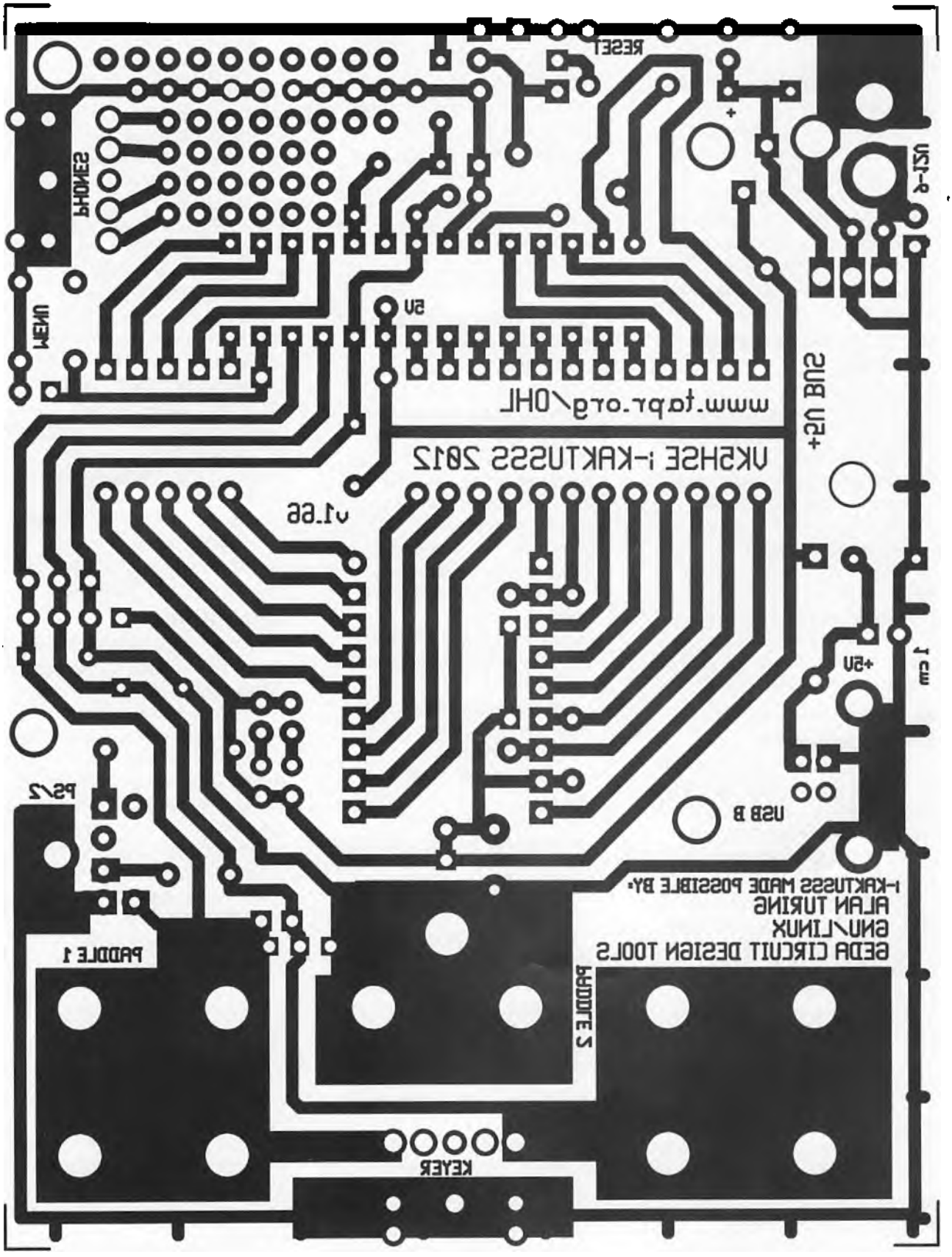

Figure 2: The i-KAKTUSSS PCB. Note that this image is oversize. Reduce to 76.2 mm by 101.6 mm.

After sounding a character, the character is briefly flashed up on the alphanumeric display. This is what makes this trainer different to CDs, tapes, broadcasts or standalone Morse trainers. If one is unsure of the character, one can immediately see what was sounded.

The stored text mode also allows beaconing to be performed, if a suitable string of text is entered in the software, with the bonus that the currently beaconing characters can be seen on the display.

Morse Training – Random characters

The i-KAKTUSSS can also play a semi-random string of all of the international Morse characters. This is achieved by two loops stepping through the Morse character table in opposite directions in prime number steps. This should be random enough for most users, and feels more random than using the PicAXE's built in random number generation function. Again, the character is sounded, and then briefly displayed on the alphanumeric display for visual reinforcement.

Morse Training – Koch Method with keyer

A rather rudimentary Koch training mode has been implemented which steps through the international Morse characters visually, based largely on the standard Koch character sequence.

A character is displayed, and the keyer waits for it to then be keyed. This continues repeatedly until the user has keyed the character into the keyer correctly ten more times than incorrectly, after which the keyer will move on to the next character. If the character is repeatedly keyed in incorrectly, the character is flashed up again and sounded. The Koch trainer will also jump back to previous, successfully keyed characters from time to time.

Morse Training – Koch Method with keyboard

Like the Koch Method with keyer, the Koch method with keyboard expects the character sounded to be entered on a PS/2 keyboard. This of course requires a suitable connector to be fitted for a PS/2 keyboard, and a keyboard if one wishes to make any progress. A limitation of PicAXE basic is that it does not recognise all the 'shifted' PS/2 keyboard characters equivalent to all of the international Morse characters, and the training mode tries to take account of this. This mode is a work in progress.

In depth software details for the i-KAKTUSSS

PicAXE BASIC was chosen for the i-KAKTUSSS as the code is easily understood, allows quick and easy modification by novice programmers, and speeds up the development cycle. That being said, BASIC as a programming language has various limitations, and PicAXE Basic has the following specific limitations in this application:

- code must reside in four 4k slots.
- only variables and EEPROM memory are shared between the four slots.
- local variables cannot be used.
- subroutines cannot easily be passed arguments.
- subroutines cannot be called across slots.
- hardware interrupts are not available on the PS/2 compatible pins.
- difficulty storing variables between power cycles.
- not all PS/2 keyboard characters are recognized.

These limitations are overcome in an essentially transparent manner for the user by:

- not using interrupts.
- duplicating the necessary subroutines and memory tables in each slot.
- allocating the major i-KAKTUSSS functions to various slots.
- putting the main control loop and menu system residing in slot zero, and jumping to the relevant slot for the mode selected.
- having a dumbed down Koch teaching mode that does not remember your statistics.

There is nothing to prevent a keen constructor from programming a suitable pin compatible microcontroller (provided it can safely source or sink up to 200 mA) in assembler or C and using this instead of a PicAXE28X2, but this approach was discounted in the design of the i-KAKTUSSS as it would make it harder for casual builders or those new to programming to modify the i-KAKTUSSS code, stored text, and default settings to suit their own needs. Equally, a keen constructor could try stripping down the software to fit into an older PicAXE28 chip if fewer functions are required, taking due care to ensure safe current sourcing and sinking limits are not exceeded, specifically on the PicAXE28X1 (95 mA maximum), by the display.

Iambic Keying

The iambic keyer code implements a state machine which can queue one element ahead. What differentiates Type A from Type B keyers is the timing of the recognition of the next character. In general, Type A keyers wait until after the current element and its following one dit pause have elapsed before detecting and queuing the next character. In general, Type B keyers start detecting and queuing the next character to be queued during the current element and its following one dit pause.

Type B keyers vary in terms of when during the currently sounding element they start detecting and queuing the next character, some starting straight away on commencement of the current element being sounded, others waiting until half a dit before the current element has finished sounding, and others waiting until the element has just finished sounding.

Type A keyer users often find the opposite element added to their

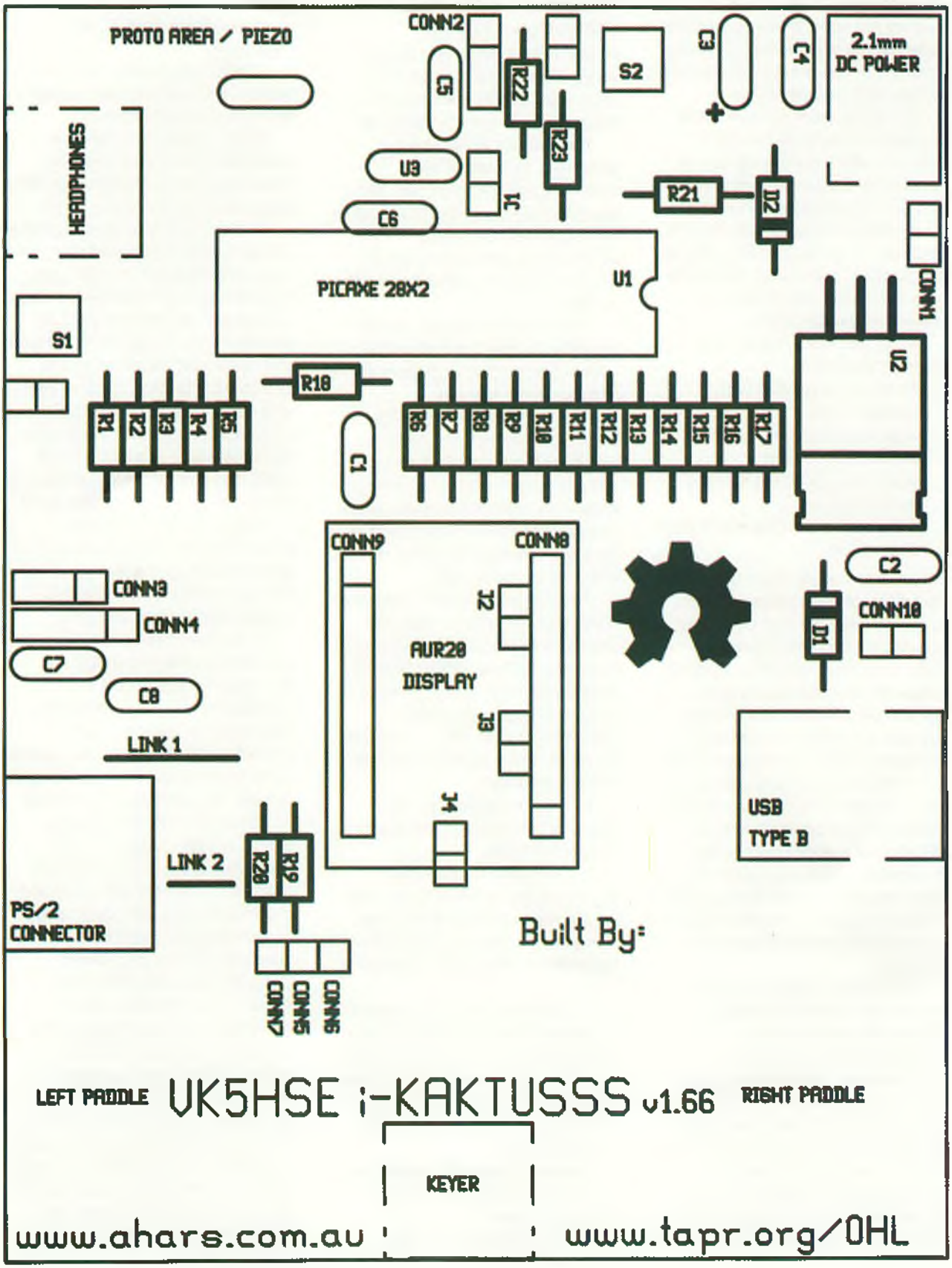

Figure 3: The i-KAKTUSSS component layout.

squeeze keyed characters because they are not used to letting go of the keyer paddle early enough to avoid an iambic mode B keyer recognising the opposite paddle action.

An iambic keyer is named after the iambic quantitative metre of poetry, in which a short element is followed by a long element in verse, with the cycle repeating five times.

It follows that an iambic keyer is so-called on account of its ability to play alternating dits and dahs while both the dit and dah paddle are pressed at the same time.

An iambic Morse keyer must therefore establish:

- if a key or keys have been pressed, if so,
- what, if any, was the previous element keyed, and
- does this affect what the next element will be.
- is the next element going to be a dit or a dah.

So, an iambic keyer must queue the next element and implement logic to decide what the next character should be if both keys remain depressed when the time has come to look for the next paddle press. The software keeps track of what key was keyed last, to determine which element to sound next in the event that both keys are pressed. The software polls the keyer inputs repeatedly, performing a logical OR with the relevant paddle flag, to establish whether a paddle has been pressed, and the timing of the polling is based on whether mode A or mode B operation has been selected.

Alternatively, interrupts could be used for keyer input polling at the expense of reduced comprehensibility by novice programmers. The simplicity and speed of software execution in the i-KAKTUSSS using the inbuilt oscillator was found to be sufficient without needing to resort to interrupts, plus it allowed the pins for paddle input to also be used with a PS/2 keyboard if desired.

Milestones in the evolution of electronic keyers

Dit and Dah duration and keying speed were the first things to be automated by electronic keyers in the move away from straight keys.

The first electronic keyer advertised to amateur radio operators was the three tube Mon-Key (Monitor-Keyer) sold by Electric Eye Equipment Company in 1948, which offered precisely timed dit and dah durations with dit and dah paddles.

This was followed very shortly thereafter by the Duomatic AKS-7, from Electronic Signal Devices, offering similar features.

A less common keyer mode is the ultimatic mode of keyer, a tube based version of which was first published in QST by John Kay W6SRY, in 1953. An ultimatic keyer continues to sound the element of the paddle last depressed and is favoured by some users.

The Hallicrafters HA-1 electronic keyer was released in 1960, and used a valve based circuit designed by James B. Ricks W9TO. A solid state version of the W9T0 design was published by Chet Opal K3CUW in QST in 1967, the Micro-TO keyer, which appeared in later ARRL handbooks.

Element insertion was the next problem to be addressed by electronic keyers.

In 1968 John Curtis K6KU, developed an electronic keyer, the EK-38, which offered dit insertion. This was followed by the EK-39 in 1969 which offered dah insertion as well.

An electronic keyer developed by James M. Garrett WB4VVF, the Accu-Keyer, was published in QST in August, 1973, and offered Iambic Keying with dit and dah queuing, which became known as iambic mode B keying.

Character memories were the next feature to be provided by electronic keyers.

The Accukeyer, the Curtis keyers, and other commercial keyers were later offered with memories for frequently used messages.

Finally, keyers have become simpler, with reduced part counts and power requirements.

K6KU moved on to develop a complete keyer on a chip, and announced the Curtis 8043 and 8044 keyer on a chip ICs around 1973.

In 1981, in response to customer demand, K6KU produced the Curtis 8044B which added mode B iambic keying to the keyer on a chip which had become popular with the Accu-Keyer, Ten-Tec, Heath and Nye keyer implementations. The final Curtis chip, the 8044ABM was released in 1986, and MFJ eventually purchased the rights to the 8044 keyer on a chip. The M suffix denoted the ability to attach a moving scale meter to show WPM.

Curtis Mode A and Curtis Mode B simply refer to iambic A and B modes as implemented by the Curtis 8044 keyer on a chip products developed by K6KU.

In the last fifteen or so years, one time programmable and then electrically erasable and reprogrammable microcontrollers have become cheaper, more powerful, and simpler to use, leading to the latest phase of keyer designs, namely, the software defined keyer.

Steve Elliott K1EL, released the K8 in 1997, based on a PIC microcontroller, and a multiplicity of keyers have been designed and described since using dedicated microcontrollers, such as those variously described by Owen Duffy VK1OD using PICs, also Roger Traylor N4UAU, using Atmel AVR microcontrollers, and Richard Chapman KC4IFB, using Arduino development boards. Microcontroller designs have also been published for decoding Morse transmissions such as that described by Francesco Morgantini IK3OIL, as well as for beacons and Morse code training players such as the design described by Bob Adams W6BEQ.

Morse detection in the i-KAKTUSSS

The iambic keyer subroutine has a loop which encodes each dit or dah into binary, with dits being zero, and dahs being one, from least significant bit (LSB) to most significant bit (MSB) into a byte variable.

The software detects the end of the Morse character if no paddle use has occurred and a delay of more than a dit has elapsed since the last dit or dah finished sounding.

The software to this point has also counted the number of elements keyed for the Morse characters which has been encoded into binary.

Each Morse character can be uniquely represented by a binary sequence in this way, and the issue of T (00000001) being identical to N, D, and B is overcome by also having the number of elements counted available.

If the software detects that the user has finished keying a Morse character, it proceeds to use the eight bit binary encoded Morse, which at the end of the day is just a number, in conjunction with the number of elements keyed to calculate an index used to jump into the EEPROM memory, namely:

Index = ([2 ^ (Number of elements)] – 2) + (Morse encoded in binary)

The EEPROM memory stores Morse characters in increasing order of their Morse character length, and in order of the binary encoded Morse, that is, E, T; I, N, A, M; S, D, R,....,O; H, B,...., and so on.

The byte retrieved from the calculated EEPROM memory location is then used as an index to jump into the memory table storing details of the Morse character.

Invalid sequences of dits and dahs which are not Morse characters are decoded and displayed as an animated cross.

Because the memory table storing the bit-patterns for displaying the Morse characters on the alphanumeric display stores the character data in ASCII order rather than Morse binary encoded order, the EEPROM lookup table is necessary as a convenient index into the memory table.

Once the character information has been retrieved from the memory table, the character drawing subroutine is called to display the keyed character.

A modified version of this iambic keyer subroutine is used to confirm that the correct Morse has been keyed in the Koch method with keyer training mode.

Software configuration

As well as being able to choose WPM, the menu system allows the various modes of operation to be selected. The default inter character spacing is consistent with standard Morse code, but this can be altered by increasing the 'Farnsworth Factor' default setting of 10 to longer durations in the menu system, or in the software if the change is to be made the default setting.

The main software control loop is easily modified by the user to implement new default settings such as:

- mode of operation on powering up.
- WPM.
- on off keying rather than sound output.
- Farnsworth spacing.
- type of iambic keying.
- beaconing.

Keyboard detection

The built in PS/2 support is used to read characters from the keyboard after which a PS/2 to memory table index subroutine is used to find the corresponding Morse code. This code is very much alpha grade at the time of writing – no warranties express or implied!

Readers could re-purpose this code to make their own PS/2 to iambic keyer input devices for rigs which accept iambic inputs, subject to the PS/2 limitations of PicAXE BASIC.

Customising your keyer

The circuit board has been designed with maximum flexibility in mind, and allows additional components to be added without difficulty, such as:

- a header or a 3.5 mm phono jack for an external keyer.
- a header for an external 5 V supply.
- a header for an off board piezo speaker or muting of the onboard piezo.
- headers for off board menu and reset buttons.
- a header for a programming cable.
- different sized piezo speaker.s
- a header and PCB provision for a PS/2 keyboard socket either on board or off board with two associated PCB links.
- a 5 V regulator, associated circuitry and a header and DC barrel connector for 9-12 V supplies.
- the circuit board is easily modified to suit common cathode displays, and varieties of 17 segment display with different common anode or common cathode pinouts can be accommodated if the specified type of display is unavailable, provided software changes are made to invert or shift the bit patterns.
- a breadboarding area and 3.5 mm phono socket provisions with nearby GND and 5 V have been provided in the audio output section of the PCB if low pass filters, headphones, a pure sine wave generator, a speaker amplifier, or a small microcontroller for rig sequencing are desired.
- a 16 MHz crystal and associated capacitors to provide 64 MHz operation.
- jumpers for the paddle pull-up resistors can be installed if touch keyer operation is something users wish to experiment with in software.

See the *http://www.ahars.com.au/* website for details of what is included in the kit.

Possible enhancements

There is scope to generate RTTY output from Morse input, if suitable software is written. PSK could potentially be generated from Morse, but would require more advanced C or assembler programming.

A range of iambic mode gating reflecting a continuum from type B all the way through to type A.

Published touch keyer designs have relied on high impedance analogue circuitry to detect touch, but this can now be performed by microcontrollers such as the PicAXE28X2 without any additional circuitry.

Although the PicAXE28X2 supports touch sensing, it has not been implemented or tested at the time of writing since:

- the software touch detection timing has to be customised to the capacitance of the wiring implemented by the user.
- the pull-up resistors have to be disabled (landings for optional jumpers are on the PCB), preventing ordinary keyer and PS/2 keyboard use, although newer 28X2 parts do allow individual internal pull-ups to be set in software.

Concluding remarks and disclaimer

The i-KAKTUSSS code is being released under the GPL3. This means that the code can be freely redistributed provided that credit is given to its author, and that any customers sold the code must be provided with a copy of the source code so that they may modify it themselves or redistribute the code should they need to.

If the software doesn't behave just how you'd like it to, feel free to improve it! Experimentation is what it's all about! Clocking the PicAXE28X2 at 64 MHz is possible with an external 16 MHz crystal, so feel free to see what is possible.

The circuit board was designed in gEDA, the open source PCB design software suite available under *nix operating systems, and the PCB has been released under the TAPR OHL open hardware licence with the aim of fostering education and interest in electronics, programming and amateur radio.

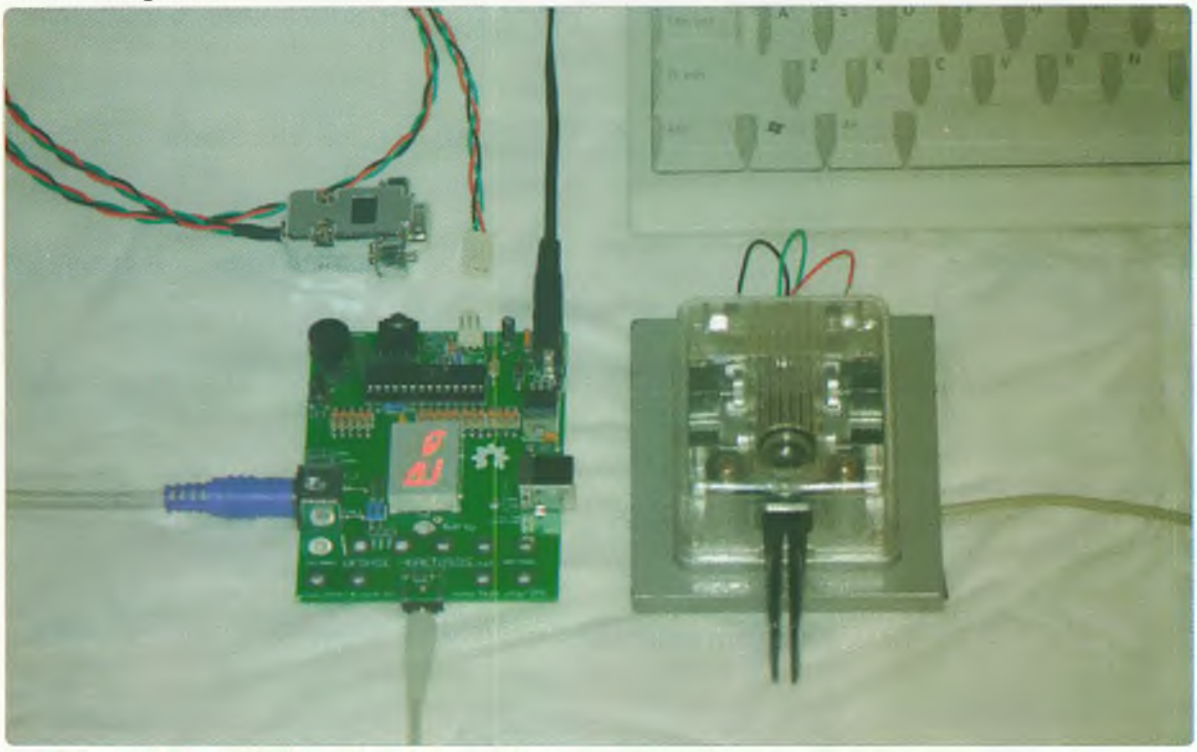

Photo 1: A fully optioned i-Kaktusss build using a v1.67 PCB with PS/2, USB and DC barrel connectors, and 3.5 mm external keyer connector populated. It is being powered via the 2.1 mm DC barrel connector rather than USB connector for this photo.
The large PCB vias allow a simple onboard keyer to be made with bent paperclips, but in this case, external iambic paddles have been plugged in to sound the Morse on the installed piezo (black cylinder, top left of the PCB), which is then displayed on the 17 segment screen; in this case, '&' (di dah di di dit).

A PS/2 keyboard (optional) and shown plugged in, can be used to convert key presses to sound and display the corresponding Morse code when in the PS/2 training modes. (Since writing the article, the PS/2 software routines have been made to behave.)

A serial cable is also shown (red/green/black wires and three pin connector <-> DB9), allowing the PicAXE software to be customised by the builder if desired or required, that is, for beaconing, QRSS, experimenting with touch keying, and so on.

Check out the Adelaide Hills Amateur Radio Society (AHARS) website for details of kit availability at *http://www.ahars.com.au/*

Component List

U1 PicAXE 28x2, programmed.

Red 17 segment alphanumeric display, 20.32 mm (0.8 inch) character, pin 11 common anode, that is, AUR20A or similar.

D1,D2,D3, 1N4004 or suitable Schottky rated at 1 A.

R1-R17, 390 ohm 0.25 watt carbon or metal film resistors (NB use 560ohm resistors for R1-R17 if using 28X1 instead of 28X2).

R18-R21, 4.7k 0.25 watt carbon or metal film resistors.

R22, 10k 0.25 watt carbon or metal film resistor.

R23, 22k 0.25 watt carbon or metal film resistor.

C1,C2,C4, 100 n MKT or similar.

C3, 47 uF 10 V electrolytic.

PIEZO - piezo speaker with 0.2, 0.3, 0.4, or 0.5 inch pin spacing, NOT a buzzer

S1, S2, momentary NO PCB mount switches i.e. TYCO ELECTRONICS FSM18JH

1 x 28pin DIL IC socket.

U2, LM7805 5 V regulator, TO220 package.

DC power jack, 2.1 mm, i.e. CUI Inc. PJ-202A.

Type B USB socket, that is, MULTICOMP MC32596

PS2 socket PCB mount i.e. 4UCON 4u-0918KE3EV10.

2 x 3.5 mm stereo audio sockets, that is, SINGATRON ENTERPRISE CO. 2SJ-01001N23 aka SJ-100.

Headers are optional and only required for off board wiring. The 16 MHz clock crystal and associated capacitors are optional for the simplest possible build.

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Eastern Zone Amateur Radio Club celebrates 75 years

Chris Morley VK3CJK - Secretary

During the month of May, the Eastern Zone Amateur Radio Club (Inc) will be celebrating its 75th Anniversary.

The first meeting of the Club was held on 14 May 1938 in Warragul. Initially the Club operated as the Eastern Zone of the WIA (Victorian Division), the Club later retained the original name for some time and renamed itself following the formation of the national WIA.

We are currently planning to celebrate our Anniversary with a Dinner on the weekend of 18/19 May, thus avoiding Mother's Day. Details of venue and time will be available on the Club website *http://www.vk3bez.org/*

Special callsign

For the month of May, we will be operating the special callsign VI3BEZ75. We plan to keep the callsign on air as much as possible, by rostering its use around the Club members. A special QSL card will be available after the month has concluded. We look forward to working as many stations as possible.

GippsTech 2013

Planning is well underway for GippsTech 2013, to be held on the weekend of July 13/14 at Monash University Gippsland Campus in Churchill. Events kick off with an informal gathering for dinner and lots of discussion on the Friday evening.

Formal activities start at around 0900 Saturday, with one and a half days of technical presentations, good food and even some low-key trading during the coffee and lunch breaks.

Saturday evening sees a semi-formal dinner in Morwell – but with no formalities, it is really about fellowship.

Sunday kicks off at 0900 with more technical talks, finishing off at around 1300 for lunch. This allows some time for those coming from further afield to make a start on their trips home.

Details of registration and the draft program should be available soon on the Club web site.

Designing for aesthetics and usability in homebrew equipment

Peter Parker VK3YE

Introduction

Many readers will remember the look, feel and sound of their first receiver or transceiver. There may even be a yearning to have one like it again, despite its bulk, likely indifferent performance, or limited versatility. Designs for radio gear abound. Typically though the schematic and description thereof dominates, with aesthetics and ergonomics left to the builder. This article adds some balance and aims to encourage construction that feels as good as it works.

The constructor's imagination

Like knowledge, imagination must be cultivated. The practised mind continually sees usefulness in items made for another purpose. For example a kitchen chopping board could be cut for antenna insulators, irrigation tubing for open wire feedline spreaders and a loaf tin for a project chassis or box. Baking trays provide metal that is expensive to buy in small quantities. The question to ask is not so much 'Is it useful?', but 'Can it be useful?'

Either abundance or scarcity can drive design. An impatience to finish a project without waiting for a mail-order can lead one to examine what can be done with the parts on hand. The experimenter may modify an existing design to suit available parts and the ability to make working substitutions (both at the component and stage level) is a mark of their skill. Even the will to begin a particular project may be strengthened as one finds (for example) a nice tuning capacitor, dial drive, crystal filter or handy-sized box.

Photo 1: A tuning dial occupies pride of place while handles provide protection when packed.

Looking the part

Some projects are thrown together without much thought as to their look or feel. However it is the equipment's interaction with the senses of sight, sound and touch as much as its RF performance that determine those that become favourites.

Group controls with similar functions. Controls should ideally be placed near dials, displays and meters that indicate their setting but not so close to be obscured by the hand that adjusts them. Tight spacing on one side of the panel with a large expanse elsewhere is also poor ergonomics. And optimum socket placement means operation without leads crossing on the operating table.

Classic radios draw the eye to their dial, with a large knob inviting the user to tune. If copying this approach allow room for a large dial, front-facing speaker and well-spaced knobs, switches and sockets when selecting a case. The tuning or VFO knob should be larger than, and well-spaced from, other controls.

It's often hard to obtain much bandspread or dial resolution on a homebrew set. Make the most of space by having the pointer as near as possible to the dial scale. This avoids parallax errors when reading. The same rule applies to drum type dials but here it's essential to have an etched line on a dial glass (or plastic) near the drum, and not just a pointer away from the dial.

Dials and displays need to be readable in all light conditions, including direct sunlight. Dial numbers must be large enough to be readable but small enough for the user to easily estimate their midpoint and thus the indicated frequency. Markings beside numbers and at points in between aid dial resolution and in this area

we can learn much from quality watch faces.

Portable equipment may cramp space for dial mechanisms and tuning scales. Overcome this by ensuring your VFO covers only the busiest section of the band and not anything outside. For example a 7 MHz CW rig might tune only the bottom 30 or 40 kilohertz. On SSB you won't lose many contacts if your set only covers 7 to 7.2 MHz, but the tuning will be easier than with a 300 or 500 kHz range.

Modern rigs often use LCD displays or screens instead of dials. Because of their ability to show many things at once, visual clutter can be a problem. If possible use displays that allow larger numbering for important information (for example, frequency and signal strength). Measure current usage before considering a display for a backpacker-class transceiver. If too high consider alternatives such as tiny frequency counters that give a reading in Morse or via LEDs (only on when required).

Panel design for serious equipment favours symmetry on front panels, a grid-like pattern of controls and knobs all in a line. A less square and more whimsical look may also be chosen. Styles using moulded plastics may also include bold colours and freedom from strict grid geometry in control placement. This look has been more influential in consumer goods than professional or amateur homebrew gear.

3D printers, now being built by private hobbyists, will likely expand the range of case shapes possible. Their wider use may liberate us from the tyranny of the little square box that froze homebrew styles for forty years while manufacturers streamlined. Or for novelty without the effort consider containers for other purposes that could be used to house radio gear; for this imagination mentioned earlier is key.

Good form has functional as well as aesthetic benefits. Pocket radios and other portable equipment have long had recessed controls that ease placement in pockets. In contrast, homebrew rigs, even for portable use, often have protruding knobs, reducing ruggedness and ease of packing. If there is no room to recess knobs inside the box, try screwing sheets of plastic (for example, chopping board material) to the case with semi-circular cut-outs for knobs for a part-recessed effect. Or, follow the pros, and install handles that protrude further from their rack mount cases than the switches and knobs.

If you find a nice tin to build a project in, is your first instinct to sand and paint it, to conceal its origin and your inability to afford a 'proper' case? Or do you pay homage to its source by leaving it be? The latter is radio's equivalent to house building from exposed salvaged bricks, recycled timber and rusted metal. Undisguised repurposed containers are popular with electronic hackers, maker-musicians and the 'upcycling' crowd. However radio constructors did it earlier, with the names of ZL2AMJ's Tucker Tin and W1FB's Sardine Sender and Tuna Tin Two transmitters celebrating their salvaged food origins.

Should the case reflect an equipment's insides? There exist examples of craftsmanship where they do coincide. A regenerative radio built last year may look like a well preserved specimen from fifty years ago. Pay special attention to authenticity if that's the look you want; odd knobs or Dymo tape labels can spoil an otherwise convincing reproduction.

Some creations have insides and outsides of different eras. A local example is the 'suitcase radio' built by Ross VK3ZZ. While its exterior indicates a WWII spy set, the insides reveal a modern solid state HF SSB transceiver.

Art, architecture, history and literature can inspire homebrew equipment styling. Such creativity is more common amongst those in the maker, hacker, electronic music, crystal set and vintage radio movements who may not have had as narrow technical backgrounds as many radio amateurs. One obscure example is the 'Steampunk' maker movement which includes some who construct radios. Drawing its inspiration from Victorian era craftsmanship and science fiction, it makes heavy use of polished brass, timber, exposed clockwork

Photo 2: The 'trail friendly radio' format allows easy use while sitting on the ground.

mechanics and phonograph-style horn speakers popular when radio was invented.

The point is that the home constructor is able to experiment with a wider variety of styles than the buyer who is restricted to the limited range from commercial manufacturers.

Touching pleasure

Precision electronics has become cheaper while precision mechanics got dearer. Equipment is more compact, more versatile and relatively cheaper while mechanical assemblies, and thus its feel, are less solid. Manufacturers have small budgets for such things, whereas the home constructor can produce a one-off masterpiece. Use the best parts for the controls handled most. In a transceiver this means the tuning dial, band switch, volume control and transmit/receive switching.

Push switches should press positively and not be, like a bad keyboard, intermittent or spongy. The lighter the equipment the lighter should be a button's touch; otherwise pressing will send it across the table. Beeps after each press may provide user feedback but too loud may be worse than none at all. Test momentary switches by trying to send Morse on them at eight to ten words per minute. If this is possible the switch is highly responsive and probably good quality.

What's worse than a lightweight item in a light plastic case? A heavy item in a lightweight case. Because the latter screams poor quality and will break when dropped. Case choice should reflect the innards. The winning combination for portable gear is lightness with robustness while more weight is allowable for home equipment. Also, can you confidently carry the item with one hand by its handle or are you nervous about it flying off? The workshop-equipped amateur engineer should be able to turn out solid-feeling equipment free from manufacturers' budgets. And even those less equipped can use salvaged knobs, switches, dials chassis and cases to replicate a better feel.

Sounding sensational

How a receiver sounds is as important as how it feels.

Photo 3: Light design. Where weight is critical build items on L or U shaped chassis (in this case circuit board material) and use the outer box to provide protection and hold accessories.

Receivers with similar RF specifications can sound very different. Some users will even sacrifice modern features like digital signal processing in exchange for so-called 'Kenwood audio'.

Things to look for include lack of hum or internal noise, strong signal performance, quality of receiver filtering, the audio stage and the speaker or headphones used. Poor filter characteristics or carrier oscillator adjustment can cause unbalanced audio. Audio stages and headphones designed for hi-fi use may allow more hiss and high frequency noise to pass than desirable. A low pass filter, even if it's just a capacitor wired across the amplifier's input, volume control and/or headphones, can greatly aid communications reception by rolling off highs. And at the bottom end, lower values of series coupling capacitors can reduce hum and muddy lows.

Commercial manufacturers may ignore acoustics for their internal speakers (possibly so they can sell you the external add-on) but that doesn't mean you have to. The speaker must face the operator for best readability of weak signals. Top, bottom or side-facing speakers are all poor compromises and plugging in an external front-facing speaker will make a huge difference.

A five to seven cm speaker may not by itself offer the best bass response for quality voice reception. An interesting exercise is to mount one in a sealed plastic box, to stimulate its environment in a typical commercial transceiver. Then drill a two cm hole in the front panel somewhere near the speaker. Notice the sound quality improvement; the hole permits air flow, allows freer movement of the speaker cone and improves bass response.

While not this article's main topic, circuit design has some bearing on the sound of equipment. Some very simple circuits may have short-cuts that compromise performance. Conversely some SSB

commercial gear may be designed for adequate communications quality rather than the best sound.

Though they may not offer AGC, noise blanking or narrow filtering, well-built regenerative, direct conversion and simple superhets provide a pleasing purity of reception. Use of such sets, especially from a quiet location, is a pleasure that all amateurs should enjoy at least once to show how the bands really do sound like.

Usabilility: it's all about you

I've concentrated on the aesthetics of equipment design, but fitness for purpose is also important. Choosing which features are essential and which to sacrifice is vital.

A homebrew transceiver will give more contacts if it's on 40 metres rather than 12 or 160 metres, so if a first project, make it the former. Similarly an FT-817 is useless for long backpacking trips due to its 300 mA receive current consumption; a homebrew set drawing one-tenth that would suit better. On the other hand a tiny rig intended for field work may be too tiring to use for extended periods at home.

The advantage of building is that you need to satisfy just one customer – yourself – and not thousands. Constraints regarding time, cost and being restricted to currently made parts may also be more relaxed.

Photo 4: This electronic music drone machine, cased in recycled timber, does not hide its salvaged origins.

The first step in design is to *ask why you need the project*. It may be to cover a band or mode your existing equipment does not, or to do a particular job better than it. Or you may just build to test a particular circuit configuration.

The second step is to *imagine yourself with the completed project*. Think about how you'll use it and what you want to achieve.

These two thought exercises should result in lists of features that are essential, nice to have and not important. Some may end up being abandoned as you run out of room on the circuit board or in the case. Or the project may suffer 'scope creep' and never be completed as you think of other features. If you reach a stalemate, reimagining yourself with the completed project may reignite interest to complete.

Conclusion

Some ideas for making projects look, feel and sound better have been presented. With any luck, equipment you build will be more useful and work better as well.

Special event station 2O12L – *London Olympics, 2012*

The organisers of 2O12L, the most successful special event station of all time and celebrating the London Olympic and Paralympic Games in the Summer of 2012 have now released a 45 minute DVD of the event. Produced by team member Fred Curtis G3SVK, the DVD goes behind the scenes of the event, telling the story of how those 69,644 QSOs were made possible.

Details can be found at their web-site *www.2o12l.com* under the 'News' link.

Courtesy John Warburton G4IRN

Measurement of relativity between the longitudinal and the differential currents in the transmission line

Lloyd Butler VK5BR

Preface

In *Amateur Radio*, August 2009, a simple test meter was described which could be used to check the balance of currents running in the two legs of a transmission line. A minor circuit modification can be made to alter the circuit so that instead of comparing line leg currents, it compares the relationship between the longitudinal (or common mode) current component and the differential current component.

Introduction

The introductory paragraphs in the earlier article gave an explanation of why there is a need to check the balance of currents in the transmission line. The explanation is repeated in the appendix at the end of this article. The original circuit of the balance meter (and also the new circuit) consists of a current transformer in each leg of the line. In the original circuit the two line leg currents were simply compared. There has been some criticism concerning whether the simple comparison was adequate to assess the degree of balance (or unbalance) on the line. The arrangement in the new circuit is a different measurement in terms of comparing the relativity of the longitudinal current component with that of the differential current component.

The differential current is the normal current component which flows in a balanced circuit or line. Current flows in one leg of the line and returns in the other leg, the same amplitude as the first leg but in opposite phase. Refer to Figure 1.

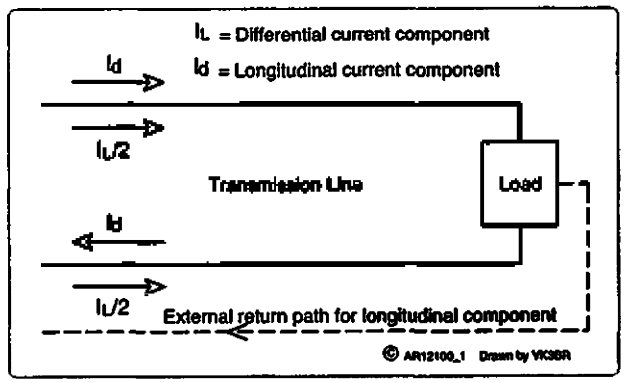

Figure 1: Illustrates differential and longitudinal components in a transmission line.

The longitudinal or common mode current component can be considered to flow equally in both line legs and in phase. In real terms it may be more complex than this, but for the purposes of the readings from this instrument, that is how the currents are analysed. The generation of a longitudinal component generally results from a return path to the source outside of the two line legs. This is also shown in Figure 1.

The presence of both longitudinal and differential components normally results in an unbalance of the currents in the two legs of the line. Measurement of these two currents was the method of unbalance detection used in the original circuit.

Basis of the new circuit

To explain how the circuit works, we turn to a few mathematical expressions.

Referring to the original circuit, Figure 2, the two line leg currents can be expressed as follows: Let I_d = differential current in the line at a reference phase of 0 degrees in one line leg. The longitudinal or common mode component I_L can be expected to be at a random phase relative to that of the differential current component. So we express that in complex form and we let $I_L = (I_{cs} + jI_{cb})$ – (its amplitude and phase relative to Id is dependent on the line location that the measurement is made).

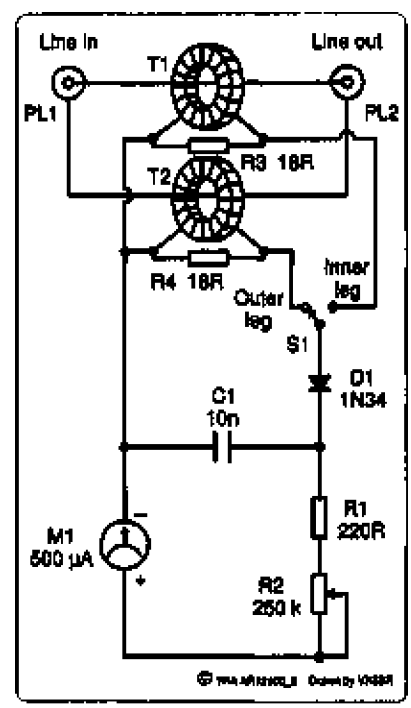

Figure 2: Circuit diagram of original transmission line balance meter.

The longitudinal current component is shared between the two legs and the current in each leg is equal to $(I_{ca} + jI_{cb})/2$. The current flowing in one leg of the line, as measured by the meter, is the result of: $[(I_{ca} + jI_{cb})/2 + I_d]$.

And the current in the other leg, as measured by the meter, is the result of $[(I_{ca} + jI_{cb})/2 - I_d]$. (Note that the differential component Id in one leg is reversed in phase to the other leg). Voltages are developed across the two 18 ohm resistors R3 and R4 equal to the currents in the two legs multiplied by a constant C. If the two voltages are added by direct mathematical addition, we get $[(I_{ca} + jI_{cb}) \times C]$ and the differential component Id is cancelled out. If one of the voltages is phase reversed and the two voltages added, the longitudinal component $(I_{ca} + jI_{cb})$ is cancelled out and the result is $(2I_d \times C)$.

The modified circuit

So all we need to do to compare the longitudinal and differential current components is to connect the two voltage outputs across the two 18 ohm resistors in series and provide a switch (SW1AB) to select phase reversal of one of the two voltage outputs. One position of the switch selects a meter reading, which is a function of the differential current multiplied by two. The other selects a meter reading representative of longitudinal current relative to the differential current. To correct for the multiplication by two of the differential current, a third section of the switch (SW1C) connects in a shunt resistor to halve the meter reading for the differential position.

Figure 3 shows the circuit modified for reading relativity of longitudinal to differential currents. All that is required is the replacement of the SPDT switch with a 3PDT switch and some re-arrangement of the wiring.

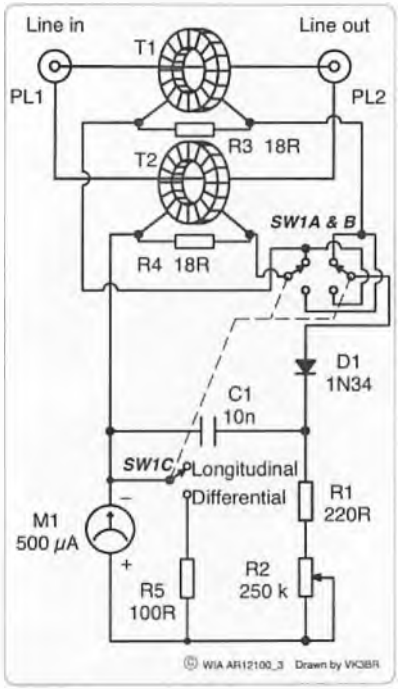

Figure 3: Circuit diagram of original meter modified to check relativity of differential current and longitudinal current.

Meter readings

With the switch in the differential position, the meter reading is a function of the differential current component. With the switch in the longitudinal position, the meter reading is a function of the longitudinal current component. If there is no longitudinal component, the meter will respond to any differential current in the differential switch position but will read zero in the longitudinal switch position.

For a given sensitivity setting, the ratio of the meter reading in the longitudinal switch position to the meter reading in the differential switch position is equal to the ratio of the sum of the longitudinal currents in two line legs to the currents running differentially.

There can be abnormal conditions which could produce extraneous results such as if one line leg is open circuit and current in running only in the other leg. One would expect that such an abnormal condition would show up on the SWR meter or from other tests. The usual SWR meter normally works on the differential current component and does not account for any longitudinal current condition.

A good match, as indicated by the SWR meter, should be checked out before testing for longitudinal currents.

Standing waves on the longitudinal current component over the length of line

It is almost certain that if the line length is considerable compared to a wavelength, standing waves will be set up in the longitudinal current component and nodes and anti-nodes of current will be formed. So the actual longitudinal current will depend on just where it is monitored as well as the degree of unbalance in the transmission line circuit.

Probably the easiest place to take the measurement is at the transmitter source connection to the line. However there is the possibility that this place also could be a node in the developed longitudinal current.

Photo 1: A toroidal current transformer coupled to a detector.

In this case, the metered longitudinal current could read low and one could be misled into thinking that the line circuit was well balanced. If this is suspected, a toroidal current transformer coupled to a detector, as shown in Photo 1, could be run down the whole line pair (or coax) for about 1/8 to 1/4 of a wavelength to detect where the nodes and anti-nodes might have occurred. If a node is located at the test point, it might be suitable to shift the location of this node by the temporary addition of a length of cable in series with the line. Alternatively, one might just add about 1/8 wavelength of cable anyway and compare the metered result with and without the added cable.

Of course, because of the variation of current along the line, these tests will simply give an indication of whether the longitudinal current component is considerable compared to the differential current component, or whether it is small enough to be ignored. If a more specific record is desired, I suggest an anti-node or point of maximum longitudinal current be located and record the relativity of the longitudinal to differential currents for that point.

Measurement to assess balance at the output of a source

Whilst the test unit was made to examine the relativity of the longitudinal current component to the differential current component on transmission lines, it can also be used in the same way to assess the degree of balance in the output of an RF source, such as the balanced output of a radio transmitter or an antenna tuner.

To set this up, feed the balanced source into the input of the test unit and terminate the output of the test unit in two series load resistors each equal to half the nominal load resistance of the balanced source output. Connect the centred junction of the two load resistors to the ground reference of the source.

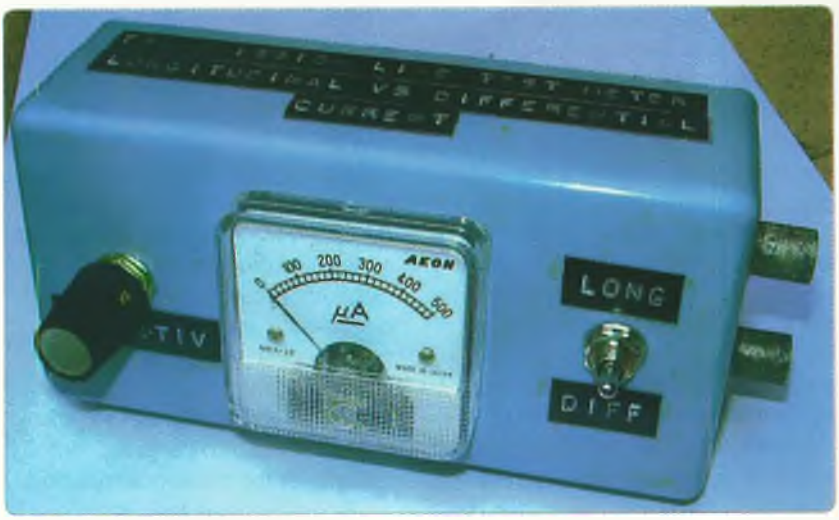

Photo 2: The completed unit.

Power in the region of at least ten watts is required to operate the test unit and the load resistors need to be rated for that power.

The test unit is built nominally for the HF bands and it is assumed that the length of leads between the source and the load would be a mere fraction of a wavelength. As such there should be no problem with standing waves and current nodes as discussed in the previous paragraph. The balance of the source can be assessed in terms of the ratio of longitudinal to differential currents as measured.

Conclusion

Modifications to the original Transmission Line Balance meter (*AR* August/September 2009), which simply compared the two line leg currents, have produced a new meter which compares the longitudinal (common mode) current component on the line with the differential current component.

In assessing measurements, either with the original balance meter, or with the new circuit arrangement, one should not overlook the effects of the standing wave which may well occur in the longitudinal current component over the length of the line. The test meter might also be put to use to assess the balance performance of the balanced output of a transmitter or antenna tuner.

Reference

'A Transmission Line Balance Meter' by Lloyd Butler VK5BR, *Amateur Radio*, August/September 2009. Also at *http://users.tpg.com.au/ldbutler/Line_Bal_Test_Meter.htm.*

Appendix

Introduction in the original article on the line balance meter

A typical amateur radio antenna installation makes use of a simple dipole or other balanced form of antenna fed via a coaxial transmission line. Because the line is unbalanced, some form of unbalanced to balanced coupling is normally necessary between the coaxial line and the antenna. Without this coupling, a condition is set up where currents running in the inner and outer legs of the coax line are unbalanced and a common mode or longitudinal current component is developed along the length of the line, causing radiation from the line. Apart from distorting the radiation pattern inherent to the antenna proper, it encourages annoying induction into equipment and wiring within the radio shack, as well as on receiving, encouraging induction of vertically polarised near field noise.

A typical balancing interface is the choke balun which must have sufficient common mode

rejection impedance to minimise the longitudinal current component. Whilst most radio amateurs possess an SWR meter which can be used in series with the coax line to check how well the antenna is matched to the 50 ohm line, it gives no indication that the currents running in the two legs of the line might be unbalanced. The SWR meter can show a perfect 1:1 SWR indicating that the antenna is loading the line with a resistance of 50 ohms. However with such a condition indicated there can still be a high longitudinal component flowing and radiation from the line.

Whether there is a serious unbalance of currents in the line legs can easily be checked by measuring the two currents. However it doesn't seem to be something which is routinely done in checking out the antenna system and verifying whether the coupling interface, such as the choke balun, is adequate for the job.

EMDRC heads to Mount Cowley

Jack Bramham VK3WWW

Photo 1: Max VK3WT operating the 70 cm station with Peter VK3QI on CW.

Over the weekend of March 16th and 17th a group of club members headed off to Mount Cowley in the Otway Ranges to contest the 2013 John Moyle Memorial Field Day. Most of the members arrived on Friday afternoon to commence the station setup – they were VK3QI, VK3AVV, VK3WT, VK3XGS, VK3MRG, VK3DLR and on Saturday morning Jonas VK3VF arrived to complete the team. On Friday when arriving on the mountain we were greeted by a large pile of railway ballast blocking the main path to the rear of the Telstra RT site. After a quick reconnaissance we noticed that Peter and Mike were setting up at the rear of the RT site so they must have got behind it somehow.

It was soon obvious that although tight the only access was available on the North side of the RT site. This was okay to enter but we could see that exiting that way may pose a challenge especially for Max and Dave who were towing caravans. By dusk on Friday all of the masts, antennas and HF stations were set up leaving only the VHF/UHF station assembly to go.

Having most of the station set up already we were able to have a sleep in on the Saturday and the slow process of setting up the six metre to 2.4 GHz stations took place. This year we had decided to test out PSK31 on HF, 6 m, 2 m and 70 cm; for 6 m Mike VK3AVV was using a Signalink interface. On HF the boys tested out an interface meant for another brand of radio and although it seemed to work

Photo 2: Jack VK3WWW operating the two metre station. To the left of the image is the setup for PSK31 including a second transceiver and monitor.

Photo 3: Greg VK3XGS and Marshall VK3MRG operating 40 m from the caravan.

Photo 4: Peter VK3QI needed some markers to assemble the dish and the callsign is his way of assembling the pieces in the correct position.

they did not work any PSK31; on 70 cm Max VK3WT was to use another interface that caused a lot of issues with the amplifier and PTT path, so he left off the interface. Jack VK3WWW had cobbled together a setup that was working but as it happened on the morning of departure he received a package in the post which was a Signalink interface with the correct cable for an IC-706MK2G. So while the stations were being setup, Jack configured the audio and PTT setup for his radio and all went well. Except when he went to connect the two metre amplifier he discovered that both the amplifier and the Signalink device required the same 13 pin accessory port so he had to think outside the square as to how he was to operate PSK31. It happened that Peter VK3QI had a spare IC-706MK2G which Jack hastily set up and connected to a Diamond X200 antenna some distance from the two metre Yagi array.

With all the dramas regarding PSK31 behind us we began contesting, slowly building up our score. I say slowly because it was very evident that quite a few of the regular stations that are usually in the field were non-existent. This meant we had to rely on mostly home stations for the bulk of our contacts. By late Saturday afternoon the heavens opened but we were all snug and protected by the caravan and tent. Not the same for other stations in the field that were reporting strong winds and heavy rain. Some even cut short the contest period making it even tougher for us to make a reasonable score. We took our hat off to one of our club members Wayne VK3WAM who hiked to the summit of Mount Torbreck. I could imagine Wayne sitting in his tent with heavy rain and wind hitting it hard. This did not seem to faze him at all for he was very quick to log and change modes just like he was sitting in the shack at home. We managed quite a few contacts with him on phone, CW and PSK31. If you would like to read Wayne's report it can be found here: *http://waynemerry.wordpress.com/2013/03/18/2013-john-moyle-field-day/*

After an early morning rain shower the weather finally cleared up and dried out a lot of the camping gear. Packing up was no real issue and with the extra hands to help it only took just over two hours before we were ready to depart Mount Cowley. As I mentioned earlier easy access to the rear of the Telstra RT site was blocked. All of the cars and Peter's trailer made it out OK. Dave took it easy with his van and made it clear but Max had to go a long way north to escape catching the side of his van on the compound fence. If his van was a little longer or wider then we may have been in a bit of strife.

Our logs have been collated and the final score is quite a bit down on last year's effort. Still it was a great weekend of contesting and really good to have a couple of new members to the JMFD team. Also we thank those who took the time to get on air and hand out numbers to those in the field.

All photos by Greg Smith VK3XGS.

Photo 5: VK3ER complete station setup.

VK5news Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

The John Moyle Memorial Field Day

Eight members of AHARS participated in the John Moyle contest this year. We went up to the bush block we have used before and this time the weather was almost kind. It was pleasant sitting in the shade of the tall gum trees, except for one very strong burst of wind which managed to demolish the gazebo covering the 40 metre station. Unfortunately there was trouble with the 40 metre station antenna(s). In fact it was the third antenna used that actually worked. Compared with other years the number of 40 metre contacts was very low, even after we got a satisfactory antenna working.

This year conditions were amazing on 20 metres, and 80 metres was as good as usual because of the very low noise. No contacts were made on 10 or 15 metres although sometimes there may have been some activity on those frequencies. The troubles we had with antennas and the wind illustrate why it is a good thing to have field day contests so we can see how our equipment stands up to emergency situations.

Rob VK5RG, John VK5EMI, David VK5AAK and Christine VK5CT were the main operators, Robert VK5ZHW, Tina VK5TMC and Jeanne VK5JQ served as relief operators and food preparers.

Fortunately the sun wasn't too strong and the shade from the trees was sufficient to protect the operators and equipment at that site for the duration of the contest.

March meeting

Mark Tell of ACMA was in Adelaide to talk to a number of amateur radio clubs about the ACMA. He spoke at the AHARS meeting on Thursday 20th. Mark made it very clear that the main effort of the ACMA today, as it has been for many years, is chasing interference.

There are still inspectors out there with their direction finding loops and the like, although much of this is done digitally and remotely today, but it is rarely the amateurs who cause interference these days. Interference is most often caused either by transmitter units bought over the internet that are not compliant with the Australian regulations, for instance, are able to transmit outside the permitted bands, or units that are intended to cause interference.

These latter units (they scramble GPS and mobile signals) are often used by vehicles for hire who wish to become invisible to their central stations so they become visible only at will when there is a better 'fare' available.

The problem then arises that they make other, nearby vehicles, invisible too. If the vehicles nearby are ambulances or other emergency vehicles it can make it impossible for their central stations to keep track of them, a very serious problem.

With the internet so worldwide and because different conditions apply in different countries, it is difficult to make sure that a device, such as a scanner, will comply with Australian rules. Some interference is caused deliberately, as mentioned, the GPS scramblers, some is caused accidentally or inadvertently, because of different rules, but all are equally illegal.

Anyone found with an illegal device may have it confiscated or they may be told to have it modified to comply – and probably show that it has been modified - but they will not be punished unless they are found to be continuing to use the device that is causing the interference.

Years ago when there were 'listening stations' in all the cities, amateurs felt that they were the preferred target. It is clear that this is not the case today. There are many more commercial operators causing problems than there are amateurs.

It was an interesting talk by someone who has been in the same field for many years and has seen many changes to both problems and methods of detection.

The May meeting will be a talk by Paul Simmonds VK5PAS on the Club trip last year to Cape Willoughby Lighthouse for the ILLW weekend. Another trip is planned for this year for the ILLW weekend and it is also the Remembrance Day contest. We will be operating in both events.

The Club will be offering an award for operation in National Parks and Conservation Parks in South Australia. More on this later.

AHARS still holds its regular meetings in the same hall but the hall has been taken over by the Blackwood Council and has been renamed as the Blackwood Community Centre on Young Street, Blackwood. The meetings are on the third Thursday of each month. All visitors are welcome.

ALARA

Margaret Blight VK3FMAB – Publicity Officer

At the time of writing, we are nearing the Easter weekend. For many it is one of the last opportunities in the year to move out of the big smoke and go camping for a few days. This also gives operators a chance to take their rigs with them. If camping in company, the sight of someone on their radio in the evening often acts like a magnet and an audience can soon gather. This provides a good opportunity to demonstrate that amateur radio is still an active hobby. So good luck to anyone venturing out for a few days relaxation and a Happy Easter to all.

What is DX?

We tend to think of 'DX' in the literal sense – a station operating from a distant location. While that may be true in some circumstances, the definition of DX is really in the eye of the beholder. DX does indeed involve distance, but it also involves difficulty and scarcity. A sought after station is one that is rarely on the air usually owing to the difficulty of getting there. The following input from Catherine VK4GH gives some personal examples.

DX writings – from Catherine VK4GH

Toward the end of summer is a popular time to try DX due to lower storm noise in our part of the world. The March calendar was full of DXpeditions to try for a contact. A very large DXpedition was organised to Clipperton Island as TX5K, and was easily heard here in VK4. Making a contact was more of a challenge, but once the operator started calling for VK/ZL everyone had a chance. One feature of their DXpedition was a live logging system on their web site, so your contact could be seen plotted on a map within minutes of being made.

A small group from Japan made a trip to Rodrigues Island in the Indian Ocean, and I was lucky enough to make a contact with the YL operator Yoshiko.

Photo 1: L-R: Susan VK3UMM, Jenny VK3WQ, Pat VK3OZ, Jean (President) VK3VIP, Mary, Pam VK3NK, Margaret VK3FMAB, Naree, Elaine VK3EQY.

Having met Steve 9M6DXX a couple of years ago, I now make a point of listening out for him on his DXpeditions, the latest one to the Spratley Islands. He is an excellent operator and it is a pleasure to listen to him working the pile ups. Steve was recently on holidays in VK3 and was able to meet up with some amateurs in Melbourne.

Conditions and propagation are often a surprise, so I was completely amazed one morning when I tuned to the frequency spotted as JX9JKA Jan Mayen Island. It is right up in the Artic, near Iceland, and so most of the time there is a 'JA wall', and his signal not very loud. Svein was calling on 17 metres, there were no Japanese, and he had a really strong signal. I easily made my first contact with Jan Mayen Island with 100 watts, after trying and waiting for several years.

The latest DXpedition has recently been concluded to the Solomon Islands and Temotu Province. As the group were returning to Europe via Brisbane, my OM John VK4IO and I made a point of meeting up with them briefly to hear first-hand some of their experiences.

Of course, at the end of March is the WPX WW contest, giving everyone the opportunity to work some new DX entities. The DX Marathon for the number of countries and zones for a calendar year is a good excuse to enter into the contest and boost your tally of countries.

A little bit of history – the ALARA badge

The idea of an official symbol for LARA (later to become ALARA) was first suggested in June 1976. Suggestions for the design were sought and the results were printed in succeeding Newsletters. Members were asked to express an opinion and the Boomerang played a prominent part in suggestions. The subject was discussed at meetings and two points of common acceptance emerged: a map of Australia and the letters YL.

By December, 1977, members were asked to view a map of Australia surrounding the letters YL enclosed within a circle. As the association's title was being changed to 'Australian Ladies' Amateur Radio Association' this was included in the design. The initial proposal appeared with a hexagon replacing the circle with the term 'ALARA' now installed. A questionnaire gained considerable

response and messages of support for including the boomerang came back.

Following suggestions to keep the design simple and easy to reproduce, the hexagon was removed plus the association's title, which was considered superfluous. The shape of Australia remained and a boomerang enclosing the letters 'ALARA' was added. The symbol had been finalised!

By August, 1978, ALARA badges became available at $3.00 each. They were immediately in demand and sixty were quickly sold. Teaspoons bearing the symbol came in late 1979 and charms appeared in 1980.

VK3 news

On Saturday 23rd March, VK3 ALARA members enjoyed a lunch at the Tooradin Sports Club bistro. An unexpected bonus for the diners was the local football club holding a match on the oval during the meal, which was easily viewed just outside the dining area. It was noticeable too just how well supported the teams were as an enthusiastic crowd was in attendance.

The lunches are held every second month and provide an opportunity for ALARA members and friends to catch up and exchange news. In order to cut down on travelling times, the venues are rotated in different areas, sometimes in the Melbourne suburbs, sometimes in rural locations. Most lunches have approximately 20 attendees which include friends and OMs, most of whom enjoy the chance to share the views of members from other radio clubs.

Photo 2: ALARA at the EMDRC White Elephant Sale: Dianne VK3FDIZ, Monica VK3FMON, Barbara VK3AGU and Margaret VK3FMAB, and in front Jean VK3VIP and Sharon.

On Sunday 24th March, the Eastern & Mountain District Radio Club (EMDRC) White Elephant Sale was held. Several ALARA members attended. An ALARA table was manned and voluntary help was given in the kitchen. This is a very popular annual event and was well attended.

VK3news Amateur Radio Victoria

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AGM this month

As a further reminder, the Annual General Meeting of Amateur Radio Victoria - WIA Victoria - is on Tuesday, May 14, at 8 pm, in the office at 40g Victory Boulevard, Ashburton.

Accepted at the last AGM was the Australian Securities and Investments Commission (ASIC) announcement that it had removed the need for annual reports and audited financial statements from not-for-profit organisations.

The ASIC ruling was that a small company limited by guarantee usually does not have to prepare an audited financial report, a Directors' report, or notify the members of annual reports. Like similar organisations, there is now no need to produce an annual report booklet, which in the past has been a financial burden. However, a financial statement is available through the member-only website, seen by appointment, sent to members reply-paid and will be available at the AGM.

The President, Barry Robinson VK3PV, is expected to give an overview of the achievements and challenges faced by Amateur Radio Victoria in the December 2012 year.

It has been a busy time including the unknown costs and the more rigid tower requirements at the Mt Stanley site needing further funding, the on-going role in education, plus numerous events.

Do come to the AGM to meet the council office-bearers plus get to socialise with other members.

Victorian Local Government Award

This operating award aims to encourage on air amateur radio activity contacting Victoria's 79 municipalities. Repeater, IRLP or EchoLink contacts are not valid for the award.

Qualifying VK3 stations need contact 40 different municipalities while other VK's require 30 and DX stations 20 municipalities.

There were 210 local government areas in the 1980s, but with a new reform-driven state government and an economic downturn, amalgamations of groups of them occurred resulting in only 79 today.

Check out the Amateur Radio Victoria website for the full rules, how to apply, useful log sheets and a name-list of local government areas.

Enrolments open for classes

A leader in the delivery of instructional classes and assessments for the Foundation licence is now taking enrolments for the session to be held on June 22-23, at the Amateur Radio Victoria office.

Orders of the study and operational practice guide book for the Foundation licence are available at $26 delivered Australia wide through the secure online bookshop at *shop.amateurradio.com.au*

To enrol in the quality classes contact Barry Robinson VK3PV on 0428 516 001 or *foundation@amateurradio.com.au*

The Homebrew Construction group

A lively discussion on homebrew topics along with a show and tell session are regular features at group meetings that are usually held on the first Saturday of the month.

At the meeting in April a Communications Test set, as a spectrum analyser, was demonstrated by Ian Downie VK3LA, who previously presented on its multiple uses for homebrewers.

The next meeting is at 2 pm on Saturday May 4, at Ashburton. All are welcome to attend and inquiries may be sent to Rob Whitmore VK3MQ *homebrew@amateurradio.com.au*

Repeater report

Users of the Mt William facility are advised that the two metre problem on VK3RWZ has been fixed. Following the fitting and tuning of a filter, the 70 cm repeater VK3RWU is back on air, and the six metre repeater under the same callsign, fitted with a 91.5 Hz tone, is working.

At VK3RMM Mt Macedon the two metre outlet works well; so does the new UHF frequency 439.825 MHz with a 91.5 Hz tone. The D-STAR 70 cm module is being worked on and should be operational soon.

VK3RPU at Arthurs Seat is also on its new frequency 439.850 MHz with 91.5 tone access, while VK3RCV Mt Alexander has been fitted with a 91.5 Hz tone on its output.

VK3RWM on Mt Arapiles is de-sensing awaiting a solution from the pager owners; a similar problem exists with VK3ROW Beech Forest.

While still out of service, the VK3RBA Ballarat repeater needs to be relocated, and also the VK3RNU site is being re-built after its total loss due to a bushfire in 2009.

Checked and operational are VK3RSG Bass Hill, VK3RML Mt Dandenong, VK3RBO Specimen Hill, VK3RCU Mt Moliagul, VK3RMS Olinda, VK3RGL Mt Anakie, and VK3RGC Montpellier.

The ATV systems VK3RBO Bendigo and VK3RTV Mt Dandenong are also working. Remember that the bulk of repeater works are carried out by our dedicated volunteers, so please be patient.

VK2 news

Tim Mills VK2ZTM
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In March ARNSW had an Anniversary BBQ to celebrate it being 103 years since our formation. It was a well-attended day with a range of activities for all. The harmonics had a jumping castle, all had an excellent catered lunch and a world class magician entertained us in the afternoon. There was a raffle for a pair of strippers – for wire that is. There was also an occasion to celebrate the recent 100th birthday of Life Member Bill Hall VK2XT.

Photo 1: Bill Hall VK2XT enjoying a joke at his expense, at his 100th birthday celebration.

This month ARNSW has a Foundation weekend on the 18th and 19th May at the VK2WI site. Assessments for all license grades will be held on Sunday 19th. Bookings by email to *education@arnsw.org.au* are required for all these activities. On Sunday the 26th it will be the regular bi-monthly Trash and Treasure at the VK2WI site at Dural.

Fisher's Ghost ARC had their AGM at the end of February with the 2013 committee being President Ian VK2MCI; Vice-President Craig VK2KDP; Secretary Lynn VK2FLMK; Treasurer Wal VK2ZWK; Publicity and IT Manager Peter VK2TQ; Social Secretary Derrick VK2DEK and general committee member Bruce VK2FCAB. The Club's Public Officer and QSL Manager is Ted VK2AU. Long standing club member Chris Newton VK2JCN was given life membership for his many contributions to the club and to the amateur radio community. Most meetings are on the last Wednesday of the month at Campbelltown High School. The club looks after the Cataract Scout Park radio shack where they had a working bee in March.

Photo 2: The 'world class magician', Joel Howlett, had everyone enthralled with his performance, as the looks on the faces of the two 'helpers' seemed to confirm.

In March the Hunter Radio Group had their AGM at the NBN Studios in Newcastle, their usual meeting location. Patrons are Norm Stanley VK2BNS and Les Baber VK2RJ. President Len Daley VK2ZFD; Vice President Maurie Jones VK2CD; Secretary / Treasurer Rodney Prout VK2CN; Repeater Officer Greg Williams VK2HT; Beacon Officer Grahame O'Brien VK2FA; Contest Coordinators Grahame O'Brien VK2FA and Jamie Campbell VK2YCJ; Broadcast committee Maurie Jones VK2CD, Michael Morrell VK2CMM, Peter Sturt VK2ZTV and Rodney Prout VK2CN; Social Secretary Pauline Jones VK2GTB; Programme officer Len Daley VK2ZFD. Their weekly news net VK2AWX is at 1930 hours Monday evening.

On the Mid North Coast the 70 cm VK2RMY on 438.075 MHz on Mt. Yarrahapinni has returned to service. It currently does not require a CTCSS tone. It shares the site with the two metre 146.875 repeater.

The Waverley ARS at Rose Bay in the Sydney eastern suburbs has a Foundation weekend scheduled for the 11th and 12th May. Contact *education@vk2bv.org* The Oxley Region ARC is well into the Standard class on Friday evenings at the Port Macquarie SES. This class should end in August and they are taking numbers for both Foundation and Advanced classes. Next month the annual field day on the Queen's Birthday long weekend is at the Tacking Point Surf Lifesaving hall. It is across two days with a dinner on the Saturday night.

The Mid South Coast ARC will have their quarterly meeting on the second Saturday in May in Milton. Further down the coast, the Far South Coast ARC based around Bega is a small club of 15 members who are finding it a financial strain operating a repeater, advises Secretary Ken VK2CRN. The solar powered repeater VK2RWP on 6825 is linked with the network in the Snowy Mountains. Perhaps more local amateurs could assist the club by becoming members.

Peter Jensen VK2AQJ presented a talk on 'The First Fifty Years of Military Radio' to HADARC at their March general meeting. Peter is well known for producing many books on various radio topics. Due out next month will be his latest publication, 'Wireless at War'.

73 – Tim VK2ZTM.

VK3news

Tony Collis VK3JGC

Geelong Amateur Radio Club

The GARC performance in the Summer VHF- UHF Field Day 2013

Once again members of the Geelong Amateur Radio Club, in this annual WIA contest, took pole positions in the sections that they entered, being single operator eight hours, multi operator 24 hours and the highest score for a Foundation Licence, Home Station 24 hours.

Dallas VK3DJ took first place in the single operator eight hour, section B, being the highest score, with 2792 points, in VHF- UHF and All the Bands category, operating from 50 MHz to 10 GHz. This was achieved in spite of the fact that he only operated for some five out of the eight hours.

Jenni VK3FJEN our Club Secretary, normally an integral part of Team VK3ALB, this time went solo from the home station and acquired the highest score, 1226 points, for a Foundation licensee, in any category. This was achieved by operating only on 144 MHz and 432 MHz.

The Lara UHF and Microwave Group (LUMEG) VK3UHF once again took out the multi operator 24 hour, section C, being 1,000 points clear operating from 50 MHz to 1296 MHz and 5,000 points clear overall, operating on all bands from 50 MHz to 47 GHz. For those that contacted VK3UHF, operating from the Baraboo Hills, the power levels used by the LUMEG Team were:

Band	Power	Band	Power
50 MHz	100 W	3.4 GHz	15 W
144 MHz	250 W	5.7 GHz	5 W
432 MHz	200 W	10 GHz	3 W
1296 MHz	60 W	24 GHz	500 mW
2.4 GHz	25 W	47 GHz	30 mW

Left to Right - Dallas VK3DJ, Ken VK3NW, Jenni VK3FJEN, Chas VK3PY and David VK3QM.

VK4news

Mike Charteris VK4QS
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The Caboolture Radio Club shack.

CQARA Rockhampton

Here's a great way to promote your amateur radio club locally, as well as have a few snags and make a quid at the same time. That's exactly what Ray VK4HOT and the boys from CQARA decided to do one Friday recently this year. The day started at 0700 local, with setting up at Bunning's in Rockhampton. Bunning's were kind enough to provide both the BBQ and marque for the day's activities. A lovely time was had by all the guys and gals working together as a team and mixing it with Joe Public. The sausages were tastefully received by the people of Rockhampton and Shaun VK4NSP was dubbed 'Chef' for the day. CQARA succeeded in promoting both their radio club and amateur radio, not to mention making a tidy profit along the way. Club Members mentioned in dispatches for helping on the day included Jack VK4JRC, Don VK4BY, QAC//WIA, Graham VK4NFZ, Shaun VK4NSP, Dell 'XYL' of Brian VK4MBG, Lyle VK4LM, Lee VK4YLW, Adam VK4MTJ and Lenore, 'XYL' of VK4FLR. Unfortunately quite a few other members couldn't be there on the day, being a Friday, but their cash donations provided nearly all the supplies for the day. So give it some thought guys, and perhaps your radio club could benefit by jumping on a similar bandwagon in your town. Give Bunning's a call today and see what they reckon. You never know, it could result in new memberships, further opportunities of promotion or just a fun day out with your mates.

Redcliffe and District Radio Club

News from Ian VK4UL, who tells us that the Redcliffe Club are currently updating the EchoLink and IRLP Server for the two metre repeater on 146.925 MHz. The server was gifted to the club by the son of VK4KYT, who works in the IT industry. The task of rebuilding the server, which has been a pain in the neck for club members this past year, will fall to Shaun VK4FY. It had been planned to happen at the clubhouse on Monday, 25 February, so all should be well by the time you read this item.

Mike VK4QS, Chairman, QAC/WIA

Of recent weeks I have been visiting the 80 metre nets throughout Queensland each night. I can now

report that they are mostly in a very healthy condition. It has truly been an uplifting experience to be able to pop into the Townsville net one night, Bayside the next, followed by Darling Downs a night or so later, just to mention a few. Our 80 metre nets are very healthy indeed with not only local club check-ins, but also regular visitors from other radio clubs throughout the state. If you are not a regular 80 metre operator, then it is well worth a visit to your local net or even a net from one of the many clubs running them throughout the week. Make of point of inquiring with net control if the club has an 80 metre net award to work for while you are there. This was once a very popular social activity on 80 metres, but has declined in recent years, unfortunately. When I started out as a novice in the early 1980's I really enjoyed getting on the 80 metre nets and working for a few awards, with the added bonus of getting to know the club members.

Caboolture Radio Club Inc

Peter VK4QC has been kind enough to write to me with a little history of the Caboolture Radio Club, which is in fact one of the great success stories here in Queensland. Many clubs face the dilemma of aging membership and periods that witness the changing of the guard. Old members fade away and new members emerge with new ideas and concepts to take the club into the future. Two years ago the Caboolture Radio Club had just seven members, a room full of junk and just a glimmer of an idea. Then in 2011 they applied for a $25,000 grant to refurbish their clubrooms, and the march was on. After several trips to the dump, work could finally begin on moving forward. The club had an old army barracks building, known as Tibby's Hut, and a bright blue demountable called the 'Blue Box'. Both buildings had been kindly donated by the Caboolture Scout Group. The grant money was put to good use in the form of a cream paint makeover for the Blue Box, followed by decking to join it to Tibby's Hut, which was also cream. The following improvements were also made, being a disabled access ramp along with new steps, windows and security screens. This was topped off with some good second hand carpet squares and a top to bottom paint job inside. A further grant saw the addition of a Kenwood TS-590, and a couple of Daiwa power supplies to fit into the professional consoles made by Gary VK4BE. If that was not enough, air conditioning has also been installed to compliment the surroundings on those warm Queensland summer months. The overall result of all these improvements has seen Club membership rise from seven to thirty-five, as people now actually enjoy being part of this great social environment. One of the club's highlights is their up and coming HAMFEST this year on 20 July, 2013. If you're in the area, pop by and visit the friendly crew at the Caboolture Radio Club, as they are open on Saturday and Monday mornings. You can catch up with the boys on their 80 metre net, on 3.610 MHz on Friday nights from 0930 UTC, and be sure to ask about working for their club 80 metre net award.

VK6news

Keith Bainbridge VK6RK
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The HARG operating the JMMFD 2013. Seated are Ray VK6ZRW and Jon VK6MAD, standing is Peter VK6AIF.

Greetings one and all and welcome to the VK6news for May 2013.

I look forward to meeting some of you at the WIA Conference later this month as well as some of our interstate readers. It should be a great event for VK6, make sure you are there!

Firstly this month we will hear from the Hills Amateur Radio Group (HARG).

HARG were out and about at Alan Anderson Park at Walliston for this year's John Moyle Field Day. The venue had a large clearing with tall trees circling it, the perfect location for a loop antenna. Ray VK6ZRW and Allan VK6PWD did a great job casting ropes over the trees to erect a great performing antenna. It was a loop of approximately 100 m in length, erected in a triangle shape and fed with home brew ladder line from the middle of one side. The antenna started the day as a dipole of G5RV length fed with the ladder line. When the ladder line we had wasn't long enough Ray made some more using cable ties and pieces of stick from the ground. We connected it to the balanced input of HARG's new tuner. It tuned up well anywhere except 160 metres.

Many contacts were made, in particular on 40 metres to the United States. Heath VK6TWO provided his two kW generator to power HARG's Ameritron amplifier and Icom IC-7400. The group had a number of visitors from the Perth amateur community and a great time was had by all. Half a dozen members camped overnight, getting stuck back into the contest at day break.

Well it's nearly time for HARGfest again. Yes, we'll be running our annual Swap Meet on the afternoon of Saturday, 11th May at the Club Rooms on the

corner of Brady and Sanderson Roads, Lesmurdie, so now is the time to start digging out all those bits and pieces that you no longer need but could be of real value to others. The entry fee is just $5 for everyone and tables are free. To book tables contact our President Martin Stretton by email at *vk6zms@iinet.net.au* or phone 0401 482 206. The doors open at 11.00 am for sellers to set-up, the Sausage Sizzle starts at 12.00 midday and the doors open for buyers at 1.00 pm. Drinks and chocolates will also be available for sale. This year we will have two commercial sellers. Mark from TET-Emtron will be there with his antennas and Heath from Spooktech will have his radios and lots of interesting accessories. Also, Steve VK6IR will have the WA QSL bureau where you can pick up your QSL cards. In the meantime, don't forget that the Club meets on the second Saturday of each month for a social and practical activities day and on the last Saturday of the month for a short formal meeting usually followed by a technical talk. The doors open at 1.00 and the meetings start at 2.00. Visitors and new members are always welcome. For more information please visit our website - *www.harg.org.au*

Hope to see you soon. Cheers and 73 from Bill VK6WJ for HARG.

May is definitely going to be a busy month in WA!

Now we hear from Anthony VK6AXB on behalf of **WARG**

It's an exciting time in VK6 with May's WIA conference fast approaching, and the West Australian Repeater Group (WARG) is working hard to ensure our repeater system will be in good shape. Working bees have taken place at key sites, and more are planned.

WARG has built and operated repeaters since the 1970s, and our services exist alongside the repeaters operated by other VK6 clubs and individuals, such as the Northern Corridor Radio Group, the Bunbury Radio Club, and the Southern Electronics Group, among others. WARG also maintains the linked Newswest system used for WIA broadcasts.

For those attending the WIA conference from outside VK6, here is a selection of the repeater options in the Perth area and beyond, to help you keep in touch at the conference, and while travelling. Detailed information can be found on *www.warg.org.au* or the WIA's national repeater directory at *www.wia.org.au/members/repeaters/data/*

The WIA conference is being held at the Tradewinds Hotel in Fremantle, and the main two metre repeater covering this area is VK6RFM on 146.950, which also has EchoLink and IRLP access enabled. VK6ROX D-STAR repeater is on 438.125. WARG also plans to temporarily locate an additional portable repeater in the Fremantle area, details TBA.

In the broader southern suburbs, two metre coverage is provided by VK6RAP on 146.700 and 439.800, and VK6RLM on 146.750. These repeaters are located in the hills area of Roleystone, along with VK6RWN D-STAR on 146.8375, 438.175 and 1273.900 (DV), 1298.300 (DD). The six metre repeater also operates from VK6RAP on 53.800, and the ten metre repeater VK6RHF is on 29.680 (CTCSS 179.9).

In the northern suburbs area, coverage is provided by VK6RNC on 146.025 (EchoLink and IRLP), VK6RNS on 434.925, VK6RTH on 146.800 and 438.225 (CTCSS 123.0), and VK6RNA on 438.725 (CTCSS 123.0).

Outside the Perth metro to the east, VK6REC in Wooroloo is on 147.175, VK6RAV covers the Northam area on 147.275 and VK6RKN in Kellerberrin is on 147.925.

To the south, VK6RMS 147.250 is located at Mt Saddleback near Boddington. In the Great Southern area, Albany is covered by VK6RAL on 146.725, and VK6RAA covers Mt Barker on 146.825 and 439.950.

In the south-west, VK6RMW on 146.900, and VK6RBY on 146.050 and 433.650 cover the Bunbury area; VK6RBN on 147.350 covers Busselton, and VK6RMJ on 147.150 covers the Manjimup area.

To the north, VK6RCT on 147.200 is located at Cataby, and VK6RGN at Geraldton. There are also several repeaters in the Pilbara area.

WIA and Newswest broadcasts can be heard Sundays on the linked repeaters VK6RAP (6 m, 2 m and 70 cm), VK6RMS, VK6RMW and VK6RBN.

Operational packet services include VK6BBS from Wireless Hill on 144.725. APRS operates from multiple sites on the usual frequency of 145.175.

If you can't bring a copy of this article - listen to Ham College's VK6RIB info beacon 145.575 - also operating from Wireless Hill, this provides a rebroadcast of WIA and Newswest bulletins, plus much other useful information.

Now an item I missed last month so my apologies to Peter VK6PK for omitting his update on the repeater scene east of Perth!

Just a line or two to advise that VK6REC is now up and running on 147.175/147.775 MHz. We have had some interesting reports from the northern suburbs and 20 km east of Beverley, however only poor results through the Mundaring Weir area. Coverage is expected to be Glen Forrest to Grass Valley. The intention is to link back to Hoddywell VK6RAV, but we still need to re-guy that site before we re-locate the two metre collinear to the top of the 58 metre mast. Currently it's at three metres. I would like to thank Ben VK6RM, Matt VK6FMLM, Jim VK6CA, WARG and Dan Cook for all their help.

Now please don't shout at me any more mate!

The NCRG was busy last month with a massive effort in the CQWW WPX SSB contest over the Easter Weekend, not an easy time to fit in contests!

The operators were VK6WX, VK6RK, VK6VY, VK6IR, VK6NU, VK6EH and VK6BEC. We managed the full 48 hours of the contest and a score of over 6.5 million points, our best effort ever. I'd like to think we will have taken out the Multi One Oceania section once again, but only time will tell.

With work and family commitments these days, my operating from home is severely restricted and contests are a great way of getting my RF injection! More members are starting to get the contest bug, hopefully before long the station will be on the air at least two weekends a month in some contest or other.

There is just a chance that the weekend of the WIA Conference, when the NCRG is hosting the Sundowner event on the Sunday evening, that Bernd VK6AA will be operating the CQWW WPX CW from the club. It's not confirmed yet but if it is those who attend will see one of Australia's best CW contesters in full swing!

For those of you attending the Conference, and in particular the Sundowner event on the Sunday night, the NCRG extends a warm invitation to join us for a meal, drinks (a bar will be running) and a look around the club. Don't forget, only those who have registered to attend the Conference, and the Sundowner, will be able to attend so get your finger out and register for the Conference and take the chance to participate in the first one in WA for many years.

Finally news from Mark VK6KMJ an NCRG Member from back in the late 80s who has rejoined the fold. Mark has staged high altitude balloon tests that were featured on local TV and is proposing to do it all again in a bigger way on the Sunday morning of the weekend of the WIA Conference.

Last time he fitted a two metre transceiver as well as cameras into the balloon and raised money for local charities as it steamed away into the jetstream! This time he is hoping to raise money for the Princess Margaret Hospital for Children and is tying it all in with Radio Lollipop, the local TV stations and of course using NCRG headquarters in Whiteman Park as the central communications centre.

The balloon will be launched from the Collie area and will probably come down somewhere around Wagin Mark will be mobile, on 40 metres, tracking the balloon and club members will be assisting where possible and communicating the location back to Air Traffic Control in Perth.

Hopefully more information as it is known will be on the NCRG website at www.ncrg.org.au

All in all a very action packed May for Perth; make sure YOU are involved too.

73. Keith VK6RK.

Beacon VK0RTM

While working in Antarctica I wanted to give something back to the hobby that has given me so much pleasure over the years.
It has been 20 years since contact was last made with Antarctica on 6 m, so I decided to install a 6 m propagation beacon to monitor openings. The beacon transmitter was kindly donated by David N3DB Secretary / Treasurer of the 6 Meter Beacon Project inc. *(http://www.6meterbeaconproject.org/)* while I purchased the antennas and cable and installed the beacon at Mawson station, Mac Robertson Land. Location: 67°36' S 62°52' E Antarctica.

Beacon details:
Antenna - 2 x M2HO loops (40 m H)
Frequency 50.300 MHz
Power 280 watts EIRP
Call sign VK0RTM

Craig VK0JJJ

VK7news

Justin Giles-Clark VK7TW
e *vk7tw@wia.org.au*
w *groups.yahoo.com/group/vk7regionalnews/*

Meet the Voice event

Even gale force winds and horizontal rain did not stop about 100 amateurs and families braving the elements and making the pilgrimage to Ross in the beautiful Tasmanian Midlands. We were fortunate to be able to use the Man o'Ross Hotel dining room for the registrations and presentations. The Sewing Circle Net person of the year is Warren Quinn VK7FWAZ and the impressive shield was passed to Warren. There were also two Awards of Merit for service to Tasmanian amateur radio. The first to Robin Harwood VK7RH and the second to Tony Bedelph VK7AX. Congratulations to all.

Many thanks to Cedric VK7CL for organising this event this year and to all who attended and especially the helpers on the day: Ray VK7VKV, Ben VK7FBGS and Rod VK7TRF. A special thanks to Kieran VK3BTV, Steve VK3DAG, and Paul VK3AFB who came across for the event and a huge thank you to Dave VK3JKY and Claureen VK3KMB from TTS Systems for making the annual pilgrimage. David and Claureen have been great supporters of the Ross event for a number of years and donated a very generous raffle prize. It all happens again in 2014 and the proposed date is 23 March, 2014.

Photo 1: Warren VK7FWAZ receiving the Sewing Circle Shield. Photo courtesy of VK7TW.

Photo 2: Robin VK7RH receiving the Outstanding Service Award. Photo courtesy of VK7TW.

Emcomm News – VK7 Fire Season

2013 has seen three activations of radio operation for the Tasmania Fire Service. The first in January with 666 volunteer hours with the Dunalley and Repulse fires, the second in February with 300 volunteer hours with the Molesworth fire and in March an additional 141 volunteer hours with the Risdonvale fire. A not insignificant 1107 volunteer hours has been provided to the Tasmania Fire Service for radio operation in 2013. Thanks to Rod VK7TRF and Roger VK7ARN for the above information.

Repeater news

In NW VK7, the VK7RTV repeaters have been moved to the QTH of Jim VK7JH at Stowport. A new Diamond A23H has been fitted to the repeater and this sits at 13 metres. Initial testing shows much improved coverage. Maintenance work on the VK7RNW repeater at Lonah has seen a new tower, base and folded dipoles installed. Thanks go to Peter VK7LCW, David VK7DC, Dick VK7DIK, Steve VK7BI, Dick VK7LDK, David VK7EX, Dion VK7DB, Steve VK7LA, Steve VK7VHF and XYL Trudy and Mick VK7FJJA who all contributed to this work.

In Central VK7, Joe VK7JG, Peter VK7PD and David VK7OB visited VK7RIN at Barren Tier to replace the repeater radio with a Unilab radio. This link is also used for the Sunday broadcast and is now operating well.

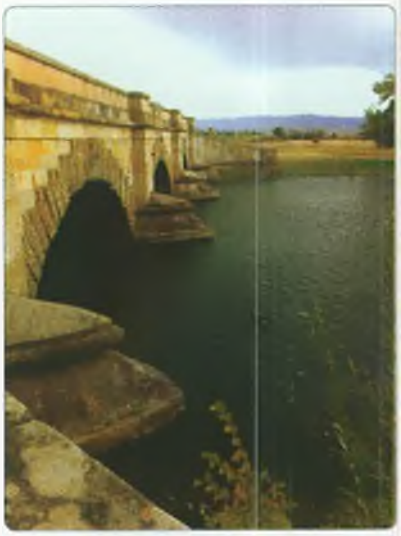

Photo 3: Ross Bridge – the location of the Meet the Voice Event. Photo courtesy of VK7TW.

Photo 4: North West Tasmania at sunrise. Photo courtesy of VK7DC.

Cradle Coast Amateur Radio Club

At the beginning of March 2013, members of CCARC provided communications support for the 2013 Pure Tasmania Cycle Challenge. This ride went from Devonport to Strahan and the weather was perfect. Communications gear included 80 MHz repeaters provided by the Octagon Organisation as well as 2 metre and 70 cm amateur repeaters, and even 40 metres was utilised.

Northern Tasmania Amateur Radio Club

March 12 saw the NTARC BBQ get together at the Lilydale Falls picnic and camping ground. It was well attended and the group welcomed Mike Turner VK5AMT/7 on the evening. I was told that Kay, XYL of Peter VK7KPC's jelly cakes are to die for and having sampled them at the Ross event I can see what NTARC rave about...HIHI. A small group stayed overnight and solved the problems of the world and thanks to Lewis VK7FLPL for that report.

NTARC's new clubrooms are taking shape at the Rocherlea Scout Hall. A number of working bees have seen the place cleaned up and new white goods donated including the obligatory coffee machine. The hall can be found by going along the George Town Road, then turn down Archer Street and take the first turn to the left on the Lilydale Road, proceed past the football hall and another left and you will see the Scout Building. The clubrooms will include a training room with amateur equipment, library and test equipment. All are welcome.

Radio and Electronics Association of Southern Tasmania

In March, REAST visited the TASSAL Hatchery in Ranelagh thanks to Michael VK7FMRS who is the sparky at the facility. The facility breeds four million salmon a year and we were taken from eggs through to smolt before they go out to the fish farm pens around the state. There is a phenomenal range of technology that is monitoring, controlling and adjusting all aspects of the huge facility. For the author it was amazing looking into a tank with 140,000 salmon living in a perfectly controlled environment. What a life!

Our DATV nights have continued to show a wide variety of material both show and tell and videos each Wednesday night from 1930. We have had a focus on the new MF 630 metre band, homebrewing and the effects of the increasing solar activity both in Tasmania and Antarctica. Our videos have included the ISS, Antarctic Auroras, Meet the Voice and a range of episodes from the well-produced AR News.

Silent Key

Charles William Howe, formerly VK7WW

Joe VK7JG has advised us of the passing of another of the North's old time characters.

Charles William Howe, ex VK7WW – 'Whiskey Whiskey', affectionately known as Double Scotch, died on 3 March 2013, in his 90th year.

Although not active in recent years, Charles was a long-time member of the old WIA Northern Branch and use to travel from Bridport to Launceston to attend the monthly meetings.

Charles was also an avid gardener and loved propagating native plants. Joe VK7JG tells he has several bottle brushes growing in his garden thanks to Charles.

Sadly, Charles' XYL Doreen also passed away some months before Christmas.

Vale Charles.

Submitted by Joe Gelston VK7JG.

AMSAT

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A plethora of transponders

It has been a while since there has been a new analogue transponder to play with. Since the launch of VO-52 in 2005 we've had DO-64 (which failed due to a capacitor in the receiver), HO-68 (antenna change over relay) and PW-Sat (which has plenty of problems). Planned for this year there are TURKSAT-3USAT, FUNcube, Ukube-1, Fox-1, Delfi n3xT, Triton-1, Triton-2 and CPUT ZACube-1. All have transponders using 145 and 435 MHz with Triton-2 also having a 2.4 GHz downlink. Some transponders are linear, others FM and one is FM up, DSB down (similar to AO-16).

OSSI-1

But first off the rank is the Korean cubesat OSSI-1. I covered OSSI-1 in last October's column and recently the frequencies and launch date have been announced. In summary, OSSI-1 has been designed and built by the artist Hojun Song DS1SBO over the past seven years. It will carry a 12 WPM CW beacon on 145.980 MHz and a simplex data transceiver on 437.525 MHz. It's main feature is a 44 watt LED array that will flash messages in Morse code. This is a larger array than the LEDs carried on the FITSAT-1 (NIWAKA) cubesat which was observed earlier this year after its launch from the ISS. But OSSI-1's orbit will be roughly twice the height of FITSAT-1, so the LED's brightness as viewed from Earth may be similar. Hopefully OSSI-1 will be visible to the naked eye. The launch is planned for the 19th of April, so by the time you read this, OSSI-1 should be in orbit [1].

TURKSAT

Next to be launched is the Turkish LEO cubesat, TURKSAT-3USAT. TURKSAT-3USAT is a collaboration between AMSAT-TR (TAMSAT – Turkish Amateur Satellite Technologies Organisation) and the Istanbul Technical University. It will have a mode V/U linear transponder with an uplink of 145.940 to 145.990 MHz and a downlink of 435.200 to 435.250 MHz. There is also a telemetry beacon on 437.225 MHz. They also mention that all systems including the transponder will have a backup. Other features include the use of super capacitors in its power system, passive stabilisation using magnets, a de-orbiting system and a camera; all in a 3U size cubesat. The launch to the 680 km orbit from China is planned for the 28th of April so it may or may not be up by the time you read this [2].

The others are planned to be launched sometime later this year on a Dnepr rocket.

Fox-1b

NASA's CubeSat Launch Initiative provides free launches as auxiliary payloads for educational projects. So far four rounds of candidates have been selected with three missions flown. The first mission launch vehicle failed to reach orbit velocity, the second has been delayed but the third was successful. Due to the third mission we now have AubieSat-1, RAX, M-Cubed, and E1P in orbit. AMSAT-NA's Fox-1 was selected in the third round and is expected to be launched later this year. The winners of the fourth round have been announced and AMSAT has a candidate. RadFxSat is a partnership between AMSAT-NA and the Vanderbilt University's Institute for Space and Defense Electronics (ISDE) and is ranked 15th out of the 24 proposals. RadFxSat will have the same FM transponder as Fox-1 (but on different frequencies) and will also support the ISDE's experiments with space radiation. Results of the experiments will help improve semiconductor devices against radiation in Earth orbit. The transponders on Fox-1 and Fox-1b will be mode U/v FM and are expected to be easier to hear than AO-51. They should be loud enough to be used with a dual band hand-held transceiver and a small antenna like the 'Arrow', 'cheap Yagi' or 'Elk'. High and low speed telemetry can be decoded using free software. Fox-1 was designed with room and support for scientific experiments; Fox-1b will the first to utilise that capability. The race is now on to get Fox-1b built and tested, ready for any available flight. The successful candidates in this round are expected to fly during the next three years [3].

It's survey time

Two survey requests were recently sent to the AMSAT-BB. The first from Mani VU2WMY is a request from the controllers of VO-52 to get your opinions on how well the transponder is performing. Please email any feedback, reports or opinions to *tprangan@istrac.org*

The University of Michigan is conducting another survey on ground stations. These include university, industry, government or

AMSAT-VK

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About AMSAT-VK

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

AMSAT-VK monthly net
Australian National Satellite net

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

In New South Wales
VK2RBM Blue Mountains repeater on 147.050 MHz

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

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

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

In the Northern Territory
VK8MA Katherine 146.700 MHz FM

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

Become involved

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

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

private individuals. They ask for your location (latitude and longitude), bands and antenna capabilities (computer controlled systems or fixed omnidirectional). The survey site is at *http://gs.engin.umich.edu/gs_survey/* The previous survey in 2009 received details from 104 stations. The idea of the survey is to estimate how much data could be received and what missions could be supported. From the 2009 survey it was found most stations had VHF and UHF capability, some had S-band but very few were able to use microwave bands. The results will be published later this year [4].

S3

A new launch initiative has recently been announced in Switzerland. S3, a new Swiss aerospace company, was launched at 1313 on the 13th of March, 2013. They aim to build and operate sub-orbital space shuttles with the first test launch by the end of 2017. On their website there is an animated video showing the concept. The launch is in three parts. A modified Airbus A300 will carry the unmanned shuttle on its back to a height of 10 km. The shuttle is released and the A300 lands as normal. The shuttle then fires its rockets and goes to a height of 80 km to release an upper stage rocket that will take the payloads up to orbital height and disperse them. The re-usable shuttle will return to Earth, gliding to the launch runway. The upper stage will burn up in the Earth's atmosphere. Already they have four launches signed up. They expect launch costs to be a quarter of present systems, but it will only cater for small satellites [5].

Final Pass

They say it's like buses – you don't see one for a long time then they all come at once. This year could have the most analogue transponders launched into stable low Earth orbits we have seen. Many will be looking forward to Fox-1 as the successor to AO-51. The other one I would like to see in orbit is KiwiSat, which has recently been announced as flight ready. Launch negotiations are now under way. During the last weekend in March KiwiSat was given a live demonstration at the Technology Convention in Auckland.

References

[1] *http://opensat.cc/blog/*
[2] *http://www.tamsat.org.tr*
[3] *http://www.nasa.gov/offices/education/centers/kennedy/technology/elana_feature.html*
[4] *http://gs.engin.umich.edu/documents/Mann_etal_2008.pdf*
[5] *http://www.s-3.ch/*

Contests

James Fleming VK4TJF

The main local contest in this month of May to get involved in is the Harry Angel contest. The date is 4th of May 2013 from 1000 – 1146 UTC. At 106 minutes it is not a very long contest and should be well suited for those just starting out in contesting. The contest first started in 1999 to celebrate the life of Harry Angel VK4HA who at the time of his death, at 106 years, was the oldest amateur radio operator in Australia. It is strictly an 80 metre contest, so no need to work out any band plans. You can either do phone, CW, or mixed mode. Each contact is worth one point on phone and two points on CW. The focus here is to work as many stations as possible without regard to DX. Now many of you do not have big back yards, however if this is the case, then may I suggest that you could go portable. For example a 50 amp hour battery would give you enough power for 106 minutes on, say, 50 watts. Then it's all just a matter of stringing up a dipole in the park somewhere. Don't forget to take your laptop because the VKCL logging program is the logging program to use for any Australian contest.

Contest Calendar for May – June 2013

May	5	**Harry Angel Sprint**	**CW/SSB**
	11	**VK/Trans-Tasman 80 metres Phone Contest**	**SSB**
	11/12	CQ-M International DX Contest	CW/SSB
	25/26	CQ WW WPX Contest	CW
June	1/2	IARU Region 1 Field Day	CW
	8	Asia/Pacific Sprint	SSB
	8/9	**VK Shires Contest**	**CW/SSB**
	15/16	All Asia DX	CW
	22/23	**Winter VHF/UHF Field Day**	**All**
	22/23	ARRL Field Day	All

Note: Always check contest dates prior to the contest as they are often subject to change.

So if you go portable or just use a dipole at home, this contest should be a lot of easy fun and an opportunity to dabble your feet in contesting. There is no division of power, however I suspect that there would not be a whole lot of difference between 100 watts and 400 watts; however there could be a bit of a difference in antenna, location, and operator skill, especially on the CW section. Since I don't have an amplifier I think that I may travel to my local park on a hill and sling up a dipole and do CW. Even with this set up low power and portable, I reckon that I will give those boys a run for the certificate this year. So if you are QRO or QRP, please keep the date in mind and give us contesters a shout. Even if you make a few contacts please submit your log.

Editor's note

May also sees the VK/Trans-Tasman 80 m Phone contest, which is a popular event. Many will be planning to work the CQ WW WPX CW Contest at the end of May.

Start planning now for the VK Shires Contest early in June, and for the Winter VHF/UHF Field Day later in June. The rules for the latter event follow.

Winter VHF-UHF Field Day 2013

John Martin VK3KM - Contest Manager

The Winter Field Day will be held over the weekend of June 22/23. This time there are two minor changes to the rules.

One is in response to concerns raised in the last few months that very large scores could be gained by stations making EME contacts, or using digital DX modes. This is the same kind of concern that was expressed when rover stations were scooping the pool - nobody likes to compete against stations that will inevitably beat them hollow!

The solution to the rover issue was to create a separate rover section, so that rovers are now competing only against each other. In the case of stations making EME or digital contacts, the solution needs to be different. I feel that the rules need to appeal to the greatest possible number of amateurs, and this aim would not be served if the rules allowed some entrants to make very large scores from a comparatively small number of contacts. The rules already disallow repeater and satellite contacts, and now they also disallow EME or contacts made using digital DX modes.

There has also been a change in the wording relating to recommended contest calling frequencies. For some

years it has been recommended that SSB stations use a contest calling frequency of .150 on each band. This has now been changed to read ".150 or higher". This is intended to serve as a reminder that it isn't necessary to stay on the one frequency. There will be less congestion if everyone spreads out a bit. It doesn't take long to tune between say .150 and .200.

Field Day Dates - Future Planning

Arising from discussion of Field Day planning last year, I have prepared a discussion paper on various options for future Field Day dates - in particular the possibility of changing the dates for the Winter and Spring events. This paper is available in the "Files for Download" section of the contest web page. Any comments or suggestions on the various options are welcome.

Dates: Saturday and Sunday 22 and 23 June 2013
Duration in all call areas other than VK6:
0200 UTC Saturday to 0200 UTC Sunday.

Duration in VK6 only:
0400 UTC Saturday to 0400 UTC Sunday.

Note the change in starting time for the eastern states, with the end of daylight saving time.

Sections

A: Portable station, single operator, 24 hours.
B: Portable station, single operator, 8 hours.
C: Portable station, multiple operator, 24 hours.
D: Portable station, multiple operator, 8 hours.
E: Home station, 24 hours.
F: Rover station, 24 hours.

Operating periods: Stations entering the 8 hour sections may operate for more than 8 hours, and nominate which 8 hour period they wish to claim for scoring purposes.

Entering more than one section: If a portable station operates for more than 8 hours, it may enter both the 24 hour and 8 hour sections. If the winner of a 24 hour portable section has also entered the corresponding 8 hour section, his log will be excluded from the 8 hour section.

If a portable or rover station spends part of the contest period operating from his home station, he may also enter the home station section.

Rover stations: The Rover section is for all portable or mobile stations that operate from more than two locator squares or change locator squares more than twice.

Two operators: If two operators set up a joint station with shared equipment, they may choose to enter Section A, B or F as separate stations under their own callsigns, or Section C, D or F under a single callsign. If they enter as separate stations, they may not claim contacts with each other.

Multi-operator stations: Portable stations with more than two operators must enter Section C or D. Operators of stations in Section C or D may not make contest exchanges using callsigns other than the club or group callsign.

General Rules

One callsign per station. Operation may be from any location. A station is portable only if all of its equipment is transported to a place which is not the normal location of any amateur station. Portable stations may change location during the Field Day provided the station is dismantled and reassembled each time it moves. You may work stations within your own locator square. Repeater, satellite, EME or crossband contacts are not permitted. Contacts using digital modes with computer decoding of the received signal are not permitted. Contacts made using modulated light are permitted, but they will be totalled separately and will not contribute to the final all-band score.

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.

Contest Exchange

RS (or RST) reports, a serial number, and your four digit Maidenhead locator. Six digit locators may be exchanged but are not compulsory. 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.

Repeat Contacts

Stations may be worked again on each band after three hours. If either station is moved to a new location in a different locator square, repeat contacts may be made immediately. If the station moves back into the previous locator square, the three hour limit still applies to stations worked from that square.

Logs

Logs should cover the entire operating period and include the following for each contact: UTC time; frequency; station worked; serial numbers and locator numbers exchanged.

Scoring

For each band, score 10 points for each 4 digit locator square in which your station operates, plus 10 points for each locator 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 all bands.

Cover Sheet

The cover sheet should contain the names and callsigns of all operators; postal address; station location and Maidenhead locator; the section(s) entered; the scoring table; and a signed declaration that the contest

manager's decision will be accepted as final.

Please use the following format for your scoring table. In this example below, the operator has activated (operated from) one locator and worked four locators on each band.

A blank cover sheet, with scoring table, is available on the Field Day page of the WIA web site.

Entries

Paper logs may be posted to the Manager, VHF-UHF Field Day, PO Box 2042, Bayswater Vic 3153. Please email electronic logs to *vhfuhf@wia.org.au* Acceptable log formats include: ASCII text, RTF, DOC, DOCX, XLS, XLSX, MDB, PDF, or any Open Document format. Logs must be received by *Monday, 8 July 2013.*

Early logs would be appreciated.

FIELD DAY WEB SITE

http://www.wia.org.au/members/contests/vhfuhf/

This site includes the rules for the next Field Day, rules and results of all past VHF-UHF Field Days, cover sheets and scoring tables, and other information.

Band	Locators	+	Locators	+	QSOs	x	Multiplier	=	Band Total
	Activated		Worked						
	(10 points each)		(10 points each)		(1 point each)				
6 m	10	+	40	+	40	x	1	=	90
2 m	10	+	40	+	30	x	3	=	240
70 cm	10	+	40	+	20	x	5	=	350
etc.									
Overall Total								=	680

Silent Key

Neil Sandford VK2EI

It is with great sadness that we record the passing of Neil Sandford VK2EI at home at Port Macquarie on Saturday, 9 March, 2013 at the age of 82 years.

Neil was born to school teacher parents in rural New Zealand on 31st December, 1930. He was the eldest of three children. His full name was Herbert Neil Sandford but everyone knew him as Neil throughout his life.

After a boarding school education, Neil followed his passion of electronics and communications and joined the New Zealand Post Office where he installed remote area communications links and radio systems. His other passions included his family, fishing, deer stalking and pig hunting. He could always be engaged in conversation over his first-hand experience in motorcycles. He was a man of many talents. He built his own house amongst many achievements.

Neil wintered at Scott Base with the New Zealand Antarctic Program during the 1957/1958 International Geophysical Year. A major highlight in his career was participating in the 1958 crossing of the Antarctic continent with Sir Edmund Hillary. Neil has the honour of the Sandford Mountains in Antarctica being named after him. He attended the New Zealand Antarctic reunion at Scott Base in 2000.

Neil took his family to Australia in 1966 when he commenced work at deep space tracking stations in a long career that took him to several states. These included stations at Cooby Creek near Toowoomba in Queensland, Honeysuckle Creek and Tidbinbilla near Canberra in the ACT, Parkes in NSW and Geraldton in Western Australia. He was involved in various space programmes including the Apollo Moon landings. Neil received many accolades from NASA for his expertise and ingenuity.

Throughout his career Neil gained a great deal of practical experience in microwave radio technology which he carried through to amateur radio. He was always active in pushing the limits of microwave communications from the regions where he lived and held a series of distance records with other similar minded keen experimenters.

Neil retired to a house in an excellent radio location in Port Macquarie, NSW, in 1998 where he became very active in the Oxley Region Amateur Radio Club. He never missed a club event and unselfishly contributed his time and considerable expertise. He fostered microwave activity both locally and elsewhere through his infectious enthusiasm in building new and more advanced systems for several microwave bands and making many contacts from portable locations. Neil was a great supporter of GippsTech and travelled to Victoria every year for the event where he delivered a large number of papers on a diverse range of technical topics. He always went to the Central Coast Field Day and each year returned with some interesting bargains. He derived great stimulation from both events each year in meeting up with a large circle of keen microwave enthusiasts.

The well attended funeral for Neil was held at Port Macquarie on Wednesday, 13 March, 2013.

To Neil's wife Verena and their children, Cheryl, Michael and Guy, and their families, the amateur radio fraternity offers its deepest sympathy.

Vale Neil Sandford VK2EI.

Submitted by Henry Lundell VK2ZHE

DX-News & Views

Chris Chapman VK3QB and Luke Steele VK3HJ
vk3qb@wia.org.au

March and April on the bands

March saw mixed conditions, but activity was generally low, with a few small flares and occasional geomagnetic storming at low to moderate levels. April started with a nice lift in solar activity. Predictions still suggest a peak in 2014.

The Equinox gave us some nice propagation in the evenings on 40 m and 160 m to North America. Again there was plenty of interesting DX about, such as: Clipperton I, Bangladesh, Uganda, Burkina Faso, Rwanda, Spratly I, a number of Caribbean islands, Albania, Temotu, Guinea Bissau, Chatham I, Tuvalu (three activations), Easter I, Mawson Antarctic Station, three Corsican islands, Lesotho, Egypt, Somalia, Tonga, and Cocos-Keeling I. Around the time of the papal conclave, there was a burst of activity from the Vatican station too.

A major DXpedition has been announced to Amsterdam I, a 'most wanted top ten' entity. This is scheduled for around the end of January 2014. A website address is given as: *http://www.amsterdamdx.org/* This, together with Heard I, another top ten wanted entity will be a most welcome start to the New Year.

Very sad news came from Tuvalu: one of the operators Ingolf DL4JS passed away on Thursday, 28th March due to a terrible accident during the T2YY DXpedition. Ingolf was a technician and serious RTTY operator, who had taken part in many expeditions. Our condolences go to his family and friends.

Some upcoming DX operations

The following table summarises some of the DX activations that may be of interest to VK operators.

Date	Call	QSL via	Information
22 April – 4 May	JD1BMH	Bureau	Ogasawara, Chichijima I (AS-031) JG7PSJ. 40-10 m, CW, SSB, RTTY.
23 – 30 April	8Q7KP	LotW	Maldives, Bodufinolhu (AS-013). VU2PAI, W4VKU.
3 – 14 May	E51AAO	LotW	S Cook I, Rarotonga (OC-013). ZL1AAO, 40–10 m, SSB.
3 – 19 May	SU8N		Egypt, Geziret Disuqi (Nelson's Island, AF-109), SU1SK, SU1AO, SU1HM, SU1AR, HF.
3 – 19 May	VK9NT	LotW OQRS	Norfolk I (OC-005). 11 operators, 80–10 m, CW, SSB, RTTY.
4 – 18 May	V31RD	K4UUK	Belize. K4UUK, 80–6 m, SSB.
7 – 11 May	C91GR	ZS6AYU	Mozambique, Bilene. ZS6AYU, 40–10 m, CW.
7 – 31 May	E51AGY	ZL2AGY	South Cook I, Rarotonga (OC-013). ZL2AGY, CW
11-12 May	TO1PF	FR1GZ	Reunion, Piton de la Fournaise (AF-016). French team, HF, all modes.
13 – 30 May	6V7S	RK4FF direct	Senegal. RK4FF, HF.
24 – 30 May	MJ/ON6NB	ON4ANN	Jersey (EU-013). Nine Belgian operators, 160–2 m, CW, SSB, PSK.

JD1BMH, **Ogasawara** (AS-031). 22 Apr – 4 May. JG7PSJ will be operating from Chichijima I on 40–10 m, and perhaps 80 m, using modes CW, SSB, RTTY. QSL JD1BMH via bureau, or direct to JG7PSJ.

E51AAO, **South Cook I** (OC-013). 3–14 May. ZL1AAO Bruce will be returning to Rarotonga, and operating 40–10 m using SSB. QSL also OK via ZL1AAO via bureau or direct.

SU8N, **Egypt**. 3–19 May. Four Egyptian operators will activate a new IOTA, Nelson's Island (AF-109), which is located 20 km east of the port of Alexandria, in the Nile delta. They plan to operate 'on most ham bands'.

VK9NT, **Norfolk I** (OC-005). 3–12 May. VK3QB, VK3HJ, VK3GK, VK3CBV, VK2CA, VK4GH, VK4IO, VK3GB, VK3IJ, VK3GL and K5YY will be on 80–10 m, CW, SSB and RTTY, with up to four stations. QSL via OQRS, or LotW. More information at **http://vk9nt.odxg.org/**

V31RD, **Belize**. 4–18 May. K4UUK will be on 80–6 m, SSB. QSL via K4UUK.

C91GR, **Mozambique**. 7–11 May. ZS6AYU will be operating from Bilene on 40–10 m, CW, using 350 watts and a R7000 vertical antenna. QSL via ZS6AYU.

E51AGY, **South Cook I** (OC-013). 7–31 May. ZL2AGY will be operating from Rarotonga, CW only.

QSL preferred via ZL2AGY direct, but bureau OK.

TO1PF, **Reunion** (AF-016). 11, 12 May. A French team will be operating from the mountain top Piton de la Fournaise, at 2,632 m. They will be on HF, all modes. QSL via FR1GZ.

6V7S, **Senegal**. 13–30 May. RK4FF will be operating again from West Africa on HF. QSL via RK4FF.

MJ/ON6NB, **Jersey** (EU-013). 24–30 May. A Belgian team consisting of: ON4ACP, ON4ANN, ON4CAU, ON4CCV, ON8CW, ON4CKM, ON6MI, ON4CJY, and ON4DCU will be on 160–2 m, using SSB, CW, and PSK. QSL via bureau or direct to ON4ANN. More information at *http://users.telenet.be/on4ann/MJ/index.html*

Oh, and don't forget the Australian led contingent to Norfolk Island VK9NT. Both of us will be on this trip and it should be an ideal opportunity to fill any missing band slots you may have for this entity. We'll be running all bands 80-10 metres on SSB, CW and RTTY. If condition prevail we may activate 160 metres and six metres, but we have no firm plans for either of these bands.

Radio Guidelines - Setting up an HF DX station – the antennas

Following on from last month's introduction to establishing a basic HF DX radio station this month we'll talk briefly about some very capable antennas that you may want to consider. Once again, let's start with some basic assumptions:

You have a total budget for antennas of about $1,200-$1,500.

Let's leave Topband (160 m) for another day. Efficient antennas for this band tend to require a lot of space. You are reasonably capable of constructing simple antenna structures and have access to a basic tool kit. You have access to an average sized block of land, perhaps a few trees as high as 8-10 metres and/or can lay your hands on suitable mast material, for example, old water pipe.

If you can extend your budget to $2,000 then a couple of good options become available for a new tilt-over mast or a second hand tower.

For starters, decide whether you want access to only the main DX bands, or whether you want to investigate and experiment with all bands from 80 m through to 10 m – perhaps even 6 m? The ability to experiment with antennas is one component of the hobby that many amateurs can readily access; you don't need expensive equipment, nor do you require bundles of money to construct fancy antennas. For the purposes of this article we'll steer clear of technical explanations and instead focus on practical considerations that hopefully will help you decide what's best for your situation. There is no shortage of technical publications to assist with theory and technical design.

Lower bands (80, 40 and 30 metres)

Due to space limitations and mechanical physics, any form of directive antenna is out of the question for most budding DXers. Probably the best choice of lower band antennas are:

Doublet

Each leg of the antenna should be half a wavelength long (λ/2), but you don't have to be too precise with your measurements. The matching unit will take care of the standing waves and present the required unbalanced 50 Ω load to your transmitter. As you see from the diagram you are better served to feed the antenna with a balanced feedline. For most amateurs there are two practical options. These are commercial 450 Ω ladder line, which is very convenient and can be sourced from a few VK suppliers for approximately $3 per metre or home-made open wire feedline. There are a number of techniques for constructing open line, and a Google search will present a few options. Contact either of us if you would like some specific and well tested options. Open wire line can be constructed for well under $1 per metre, especially if you have excess wire in your junkbox. And to add some icing to the cake, constructing your own feedline is cheap, satisfying and fun.

The above antenna is a great all round performer, and the higher above ground you can get it the better. Even a small domestic yard should allow a 40 m Doublet to be erected. This antenna is a well proven performer on 40 and 30 metres, as well as being a good workhorse all the way to 10 m.

A similar configuration can be adapted to form an inverted

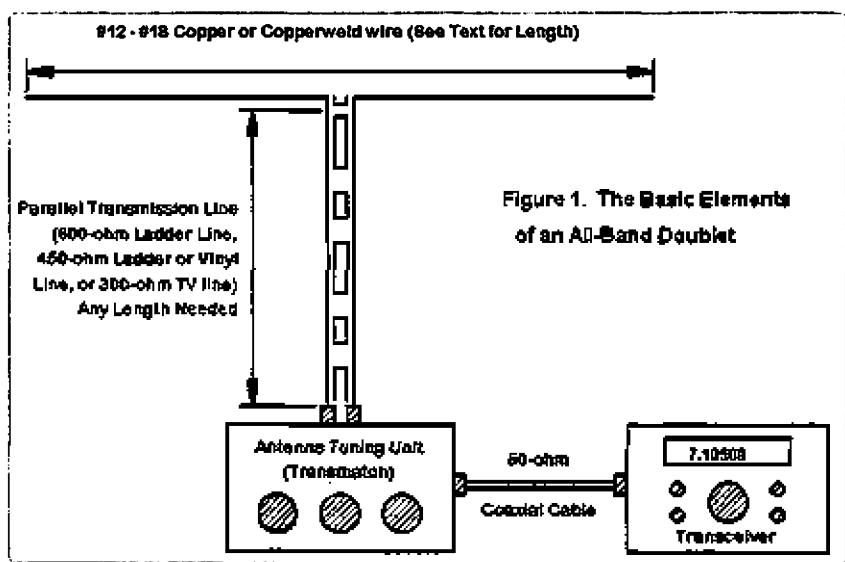

Figure 1: The basic elements of an all-band Doublet.

V or any form of bent dipole to fit your geographical limitations. You can construct the matching unit or purchase a new or second hand unit; there are many suitable units up for sale from time to time. MFJ offer a suitable range – the critical requirement is to ensure the matching unit has a balanced input; sitting behind these antenna jacks (inside the unit) will be a balun which will transform the balanced signal to unbalanced for presentation to your radio. Second hand matching units range from $50 up to a few hundred dollars. An overall budget for this antenna should be well under $100 plus the cost of the matching unit.

Higher bands (20 through 10 metres)

As we increase the frequency we decrease the wavelength and this makes antenna geometry and mechanics far easier to deal with. Active elements are shorter, getting the antenna higher in the air, relative to wavelength, becomes easier, keeping the antenna in the air is easier, and the concept of being able to rotate a directional antenna becomes a very real option for just about any DXer on a residential block. This leads us to offer two practical options.

Hexbeam

Hexbeams have become increasingly popular; we both use them with great success. Further, hexbeams can be home brewed and it's quite easy to build a five-band antenna and have it up in the air over a weekend and for less than $300. Equally, commercial kits can be purchased but the price climbs to about $800. The hexbeam offers a number of advantages:

- It has a small footprint – about six metres from side to side.
- It covers five bands – 20 through 10 metres including the 17 and 12 metre WARC bands – you can even add six metres if you wish.
- It is resonant on each band – no requirement for a matching unit.
- Single feedline.
- High efficiency – elements are full length, with no lossy traps or loading coils.
- Great performance characteristics; front to back ratio, and gain.
- Light weight; easy to get into the air, easy to rotate

Those interested in constructing a hexbeam are welcome to contact us. We have a list of local suppliers and well known design options (K4KIO Hexbeam) that we're more than happy to share with you. This means you won't have to order what is perhaps the most complex component of a hexbeam from overseas; that being the spreader plate; Brian from NBS Antennas has designed and manufactured one that fits the job nicely.

Second hand tri-bander (TH3 or similar)

Tri-banders are tried and true and used with success by many DXers. As the name suggests, these are usually three element Yagi antennas for 20, 15 and 10 metres. Most will have traps to bring resonance on the three bands. Some will have electrically shortened elements making their footprint less intrusive, but along with these benefits come compromises, and traps tend to reduce antenna efficiency.

A rough budget follows: a second hand triband beam, $350; building a hexbeam, $250, second hand rotator, $400, a 6-8 metre mast, $100, coax and control cable, $100 and miscellaneous hardware, $100.

So that's a range of about $900 to $1,100 to get an adequate directional, gain antenna for up to five bands in the air.

Other options!

Verticals

Some amateurs have great results with verticals. But this can only usually be achieved with good ground conductivity and/or lots of radials. We have had fantastic results with vertical antennas in Vanuatu, but we had them mounted at the high water mark right alongside the Pacific Ocean, an option not available to most. An efficient vertical will present a nice low angle of radiation which is an ideal characteristic for DX communication. A vertical antenna is a workable option if your space is limited, but you will need to focus on an efficient ground system.

Receiving antennas

There are many options available, far too many to investigate in this introductory article. But try doing an internet search on magnetic loops and Beverage receiving antennas as a starting point.

We strongly encourage anyone keen to build or improve their DX station to investigate antennas thoroughly. Antennas can be a cheap and easy way to add gain to your signal. And don't forget, any gain you add with an improved antenna will provide benefit on receive as well as transmit.

The internet is a great resource for researching antenna designs and options. Further, antenna design and experimentation is still one area of our hobby that just about anyone can access. It's cheap and you can really improve your performance and enjoyment from the hobby by spending time improving your antennas.

An excellent place to start looking for second hand antennas is on the Internet. Perhaps the premier internet site is VK Classifieds, which can easily be found by visiting *http://www.vkham.com/* and following the links. Other sites include eBay and of course the various commercial suppliers here in VK. Don't forget to ask around at your local club or put a Wanted add up on the internet.

As always, we welcome your feedback and comments.

VHF/UHF - An Expanding World

David Smith VK3HZ
vk3hz@wia.org.au

Weak Signal

Firstly, a big thank you to Brian VK5BC for all the effort he's put in over the last eight years, compiling the six metre notes for the column. And welcome to John VK5PO who has taken over the reins.

The bands have had some life, even though summer is now behind us. On the evening of March 3rd, Harry ZL2ADU on the south-western tip of the NZ north island found good propagation on 2 m into eastern Victoria. At 0920Z, he worked Norm VK3DUT (5x1). He was hearing the VK3RED beacon at 5x2. By 1000Z, the VK3RGI beacon was 5x9 and he worked Rhett VK3GHZ (4x1). By 1100Z, Rhett had risen to 5x2 and he worked Ralph VK3WRE/P (5x7).

The following morning (4/3), VK3RGI was down to 5x1 and Harry worked Rod VK2TWR (5x1) and Norm (5x1). Meanwhile Steve ZL1TPH/P had set up at his usual portable location at the north end of the North Island. He also was hearing VK3RGI (5x5) and VK3RED (5x2). At 2140Z, he worked Norm (5x6), Rod (5x2) and Colin VK2BCC (5x5). Harry also worked Colin (5x5). Ralph ZL1TBG also worked Norm (5x5). Later in the day, at 0430Z, Nick ZL1IU appeared and worked Norm (5x2), Steve VK2ZT (5x9) and Ross VK2DVZ (5x6) before the band closed at about 0600Z.

On the morning of March 8th, conditions were good up the coast between southern VK2 and VK4. At 2100Z, Adrian VK4OZ worked John VK1CJ (1010 km) and Rod VK2TWR (1130 km) on 2 m. He then worked Rod on 70 cm. The rugged terrain at the southern end makes these fairly difficult paths.

Sad Month

It has been a sad month with the loss of two leaders in the VHF/UHF field in Australia.

On March 10th, Neil Sandford VK2EI became SK. Neil was a great achiever, but extremely modest about it. I didn't know Neil well, but I remember many of his short GippsTech presentations which were always impressive examples of practical resourcefulness in VHF/UHF and microwave areas. Neil was a true gentleman in the amateur fraternity, and a knowledgeable one at that, who treated everyone with consistent grace and courtesy. He will be greatly missed.

On March 28th, Eric Jamieson VK5LP, 'The Voice in the Hills' who wrote this column for 30 years (1969 - 1999), became SK. I never met Eric, but heard many stories of his exploits which, no doubt, will be covered elsewhere in this magazine. However, I did realise that my small feet would never fill the big boots he had left when he retired from writing the column. Again, he will be greatly missed.

Beginner EME

Barry VK3BJM write of his exploits in getting started in EME:

Early last year I was contacted by Allen VK4EME, with regards to trying for an EME contact on 432 MHz. We had a couple of fruitless scheds, but after the final one on Sunday 11th of March I decided to try the Echo mode in WSJT, on two metres, as the moon set. And bingo - I had echoes!

The next day, about 10 degrees before moonset, I scanned down the N0UK logger to see who was where. Franco, I2FAK, was calling on 144.126, so I went looking there. Sure enough, his signal was easily readable. Despite Murphy, who disconnected Franco's mains power for about five minutes halfway through the contact, we completed just before moonset. Initial #1 in the bag.

I'd decided that I would continue using my existing four wavelength, 14-element DL6WU Yagi, rather than leap into the unknown with something new; I didn't need any extra time being consumed strolling up that avenue of fun. But I had been looking at the G/T table for two metre Yagi that Lionel VE7BQH, had compiled, and it had struck me as odd that for all the tweaked super Yagi in the table, he had never included a bog basic DL6WU Yagi, even as a benchmark to judge how much better the others were. So I contacted Lionel, to ask him if he would be interested in running the vital stats of my Yagi through the mill and seeing what came out; he said he'd be pleased to! He also modelled the array of four, to see if the spacing needed any tweaking; and to do a performance comparison between the two metre array with the 70 centimetre array nested inside, versus just the two metre array. As it turned out, a minor tweak to the spacing suggested an improvement of about 0.5 dB of gain, without upsetting the F/B of the array. But the removal of the 70 cm array suggested an improvement of 2 dB - do both and we're talking 2.5 dB.

After this I decided it was time to add elevation capability to my two metre array. That, and the removal of the 70 cm array, basically meant removing everything from the tower.

As much as I might dislike taking myself off the air, this would also mean I would have a chance to untangle my rotator body from the two sections of tower lattice; the body stuck out through the lattice, and prevented me from winding up the inner section. I also decided to start searching for a second tower, to carry the 70 cm array.

At the end of the July 2012 school holidays, I took a week of leave. As it happened, the project got a kick-start when on the first day of the leave, a fault developed in the rotator cable, which sent the direction indicator mad and eventually released smoke from two transistors in the control box. I couldn't use the array now, anyway, so down came everything. In the end it was nearly seven months of work before I was back on the air, as chances to work on the project seemed as hard to catch as the smoke from those transistors!

I built a new H-frame, from XL (Extra Light) galvanised tube - this has a wall thickness of 2 mm. The old one had been built using medium galvanised tube, which has 3.2 mm walls. The weight-saving in the new frame came in at nearly 25 kilos. I added a 2.5 metre extension to the 'stub' mast, to lift my 23 cm array and the ADS-B receiver Yagi well above the two metre array. Using an actuator and two 'pillow block' bearings mounted on a six mm aluminium plate to elevate the array proved fairly easy. I set up a test mast at ground level and spent a day or two testing, measuring and calibrating the elevation control, before shifting it to the tower.

I also took the opportunity to measure the insertion loss of every piece of Heliax and other coax in all the cable runs up to the tower, both to reassure myself that they were all still OK after seven years of use, and to have something quantifiable to feed into the likes of Doug VK3UM's EME calculator.

Incidentally, I didn't wake-up to the rotator fault actually being in the rotator cable until I had the tower up again. As mentioned, I'd decided to source a second tower, and this was achieved in October. I also bought a second rotator, of the same model as my original rotator, at about the same time. This meant I had spares, and a 'known good unit' as a reference. Having raised the tower into the air, turned on the control box and seen frighteningly familiar behaviour in the form of wild needle swinging, I depowered everything (really quite quickly!). A process of elimination, aided by a two metre rotator cable patch lead, soon pointed the accusing finger at the old cable. Once replaced, everything was peace, light and happiness again.

And so I finally fired everything up just after 2000Z on the 28th of February this year. My first contact was with Anatoly RK3FG, at 2034Z; after which I worked Guy VK2KU; Mike R3BM; Bjorn SM5CFS; Roland DK4RC; Rick PA1BVM; John G4SWX; Rune SM5CUI; Joop PA0JMV; Milos S52LM; Chris SP4K and Rene PE1L. Twelve contacts, for eleven new grid locators, in a little under three hours. So far all contacts have been made using JT65B; I would like to get the system working to the point that CW gets a run - which brings me to my receive system...

It was commented on that I seemed not to be hearing the other stations quite as well as they were hearing me, and at the moment I suspect my old pre-amplifier may be the culprit. As it turns out, it is the only part of the system that I didn't take away and 'quantify' in any way. It is one of the venerable VK5 Equipment Supply Committee (ESC) kits that I built in the early 1990s, using a BF981. After a bit of looking around, I decided to try one of the pre-amplifiers made by Gyula Nagy HA8ET, using an ATF-53189 E-pHEMT FET. Ordinarily, I'd (at least) have assembled the whole thing, but although I can reasonably accurately measure the gain of the device, I don't have any way of measuring the noise figure to ensure that, when I've adjusted the pre-amplifier, that parameter is OK. Gyula had populated and tested boards, which he could supply with suitable boxes into which I would install the board, so I went with that option. The pre-amp arrived on the day before Good Friday, and I nearly have it ready to install at the mast-head. It promises 21.5 dB of gain, and <0.6 dB noise figure.

The final piece of the puzzle is about to be worked on; the high power permit, to allow me to use my MRFE6VP61K25H 144 MHz SSPA at its full potential. After that, I need to work on getting that second tower up, and my 70 cm station back on the air. And yes, I'll be incorporating elevation into the 70 cm array, too; I just haven't decided whether to stick with the four Yagi, or push out to eight...

Photos of the project are viewable on my Flickr page, in the 'EME' set http://www.flickr.com/photos/72319077@N00/sets/72157630998604976/

VK3 Microwave Activity Day

With fairly short notice, a VK3 Microwave Activity Day was organised for Easter Monday, with 2.4 GHz being the primary operating band. Of course, contacts on any other microwave bands were also encouraged. Unfortunately, possibly because many people have Easter activities organised for them well in advance, participation was a bit down on expectations.

Seven people participated, spread over four locations:

- Gavin VK3HY and Rob VK3MQ at Mount Dandenong.
- Ian VK3AXH, John VK3AIG and Lindsay VK3WM at Mount Buninyong.
- Mike VK3KH at Arthur's Seat.
- Peter VK3TPR at home in Glen Waverley.

Signals between the portable stations were S9+ on 2.4 GHz and 10 GHz but Peter struggled a bit from home. Every one that participated had a great time and the weather was very kind to them all.

The next MAD might be scheduled for a non-holiday.

GippsTech

Finally, don't forget to mark in your diary the weekend of July 13th and 14th for GippsTech 2013. GippsTech is THE event for VHF/UHF/Microwave enthusiasts in Australia, not to be missed.

For more information, see *www.vk3bez.org/gippstech.html*

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

Digital DX Modes

Rex Moncur VK7MO

VK3XPD Extends 24 GHz EME World Record

On 13 March Alan VK3XPD extended his 24 GHz world record (see report in April *AR*) to 15,874 km with a QSO with OK1KIR using the new JT4 mode. In order to operate to his moonset, Alan had to use a long waveguide run with a number of standard and flexible sections which meant he was only getting around six watts to the feed. Alan was using his three metre dish and OK1KIR was running 21 watts to a 4.5 metre dish.

Variable Bin-width Decoding Feature of JT4

JT4 has a feature that allows decoding to be automatically optimised for the spreading of signals such as occurs with rain scatter, EME and to an extent also on tropo-scatter. Figure 1 sets out the tone spacings for the various JT4 modes.

Mode	Tone Spacing (Hz)
JT4A	4.375
JT4B	8.75
JT4C	17.5
JT4D	39.375
JT4E	78.75
JT4F	157.5
JT4G	315.0

Figure 1: Tone spacings of various JT4 modes.

Under the original version of JT4, the bin-width was the same as the tone spacing such that for example when using JT4G the bin-width was 315 Hz and thus the sensitivity was significantly reduced compared to JT4A with only 4.375 Hz bin-width which picked up much less noise. The variable bin-width feature maintains the tone spacing at the levels set out in Figure 1 (say 315 Hz for the 'G' submode) but it first attempts decoding with the narrower bin-width of the 'A' mode and thus gains the extra sensitivity for signals that are not spread. If it cannot achieve a decode in the 'A' mode, it then increases the bin-width to that of the 'B' mode, 8.75 Hz and attempts a decode and so on. For weak and widely spread signals it might move all the way up to the JT4G mode before it optimises the decoding process to the spreading of the signal. The advantage of this process is that one can gain optimum decoding for signals with unknown spreading. When the program does decode, it includes a letter in the last column which represents the actual bin-width it used to achieve the decode. One disadvantage of this process is that depending on computer speed it may not complete the decoding process until after you have started TXing. There is also a risk that it may find a false sync prior to getting to the optimum bin-width. The latest version of WSJT, r3033, includes a new feature called MinW which can be set to start the decoding process at higher bin-widths which should be set just one or two steps below the spreading you expect.

While it appears best to always use the widest 'G' mode and let the program optimise the bin-width, the disadvantage is that the very wide tone spacing of the 'G' mode does not leave much room for tuning errors or Doppler and thus the 'F' mode is generally preferred.

Spreading on 10 GHz tropo-Scatter

Tests were conducted between Rex VK7MO and Rhett VK3GHZ on 19 and 20 March over a 564 km path. It would be expected that tropo-scatter signals would be spread to some degree as signals via tropo-scatter travel via different path lengths which effectively add random Doppler shifts. Joe K1JT has analysed the spreading of the signal between VK3GHZ and VK7MO and shown that it reduced significantly between 19 and 20 March – refer Figure 2. As described above, JT4F can automatically optimise to the actual spreading and generally exceeds the performance of JT65c if spreading is more than about 20 Hz on tropo-scatter. JT4 also has a facility (implemented in the Setup Menu – Plot Average JT4 spectrum) that improves the detection of signal tones and that can be especially useful in looking for evidence of weak tropo-scatter.

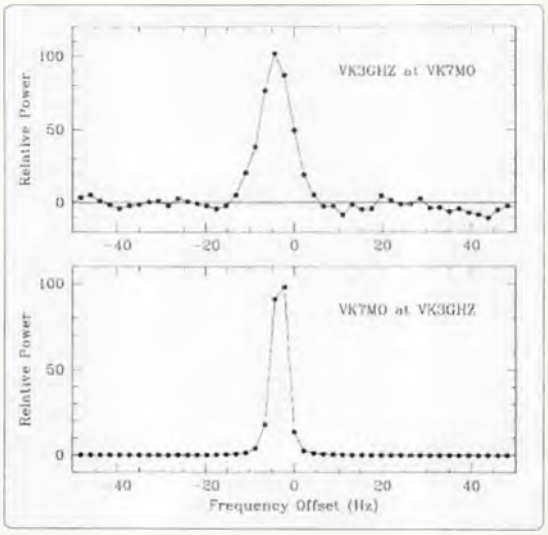

Figure 2: K1JT analysis of single tone spreading: Top 19th of March, bottom 20th of March.

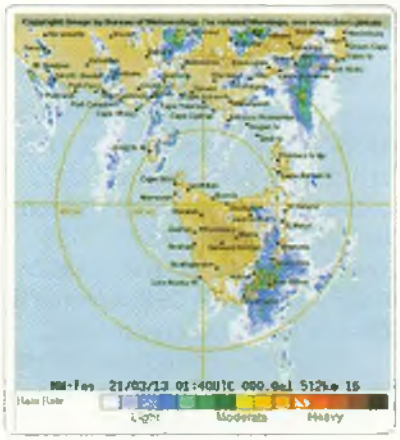

Figure 3: Rain on Bureau of Meteorology radar at time of tests on 21 March.

Spreading on Forward 10 GHz Rain Scatter

On 21 March, VK3GHZ ran tests with VK7MO at a time when there was light to moderate rain on the path as shown in Figure 3 from the Bureau of Meteorology Radar. A QSO was readily completed on JT4 with signal levels at around -13 dB. Somewhat surprisingly for rain scatter, the signals were only minimally spread by up to 30 or 40 Hz as shown by the single tone test at Figure 4. While most microwave rain scatter in VK is done over oblique paths where the Doppler shift can be more than a 1000 Hz direct forward scatter limits the Doppler shift due to the narrow beamwidth of the antennas and the fact that the path length cannot vary nearly as significantly as on an oblique path. While the tests were done in the JT4F mode the program actually decoded these narrowly spread signals in the 'A' binwidth as shown in the last column of Figure 5.

Please send any Digital DX Modes reports to Rex VK7MO at *rmoncur@bigpond.net.au*

The Magic Band – 6 m DX

John McRae
VK5PO

Hi fellow six metre enthusiasts.

It is with sincere appreciation that I have been given the opportunity to scribe this column. Having had a keen interest in six metres for at least 30 years, it will be an enjoyable 'task'.

Huge tributes go to the column writers that have preceded me. Like me, these fellows epitomise the six metre tragic.

I still remember vividly the huge pileups on six metres when I operated at VK5ZAH.

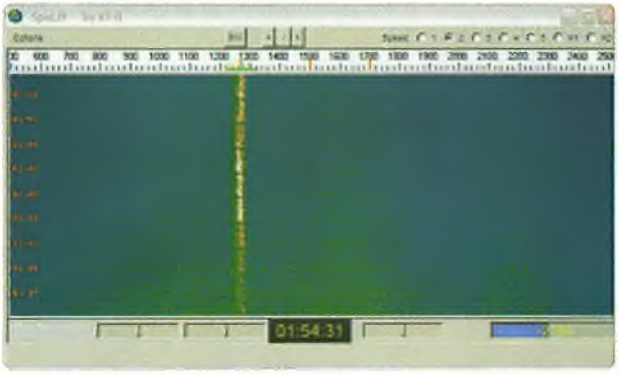

Figure 4: 1270 Hz tone shows development of rain scatter on 21 March.

```
015900 8 -13 -0.2 -2 28 * VK7MO VK3GHZ QF32 1 28 A
020100 8 -12 -0.2 -4 31 # VK7MO VK3GHZ R-12 1 13 A
020300 8 -12 -0.2 -4 28 # VK7MO VK3GHZ -12 1 14 A
020500 8 -13 -0.2 -2 28 # VK7MO VK3GHZ R-12 1 6 A
020700 8 -12 -0.2 -2 28 # VK7MO VK3GHZ 73 COO 1 24 A
020900 9 -12 -0.2 -2 28 # VK7MO VK3GHZ 73 OOO 1 18 A
```

Figure 5: Forward rain scatter decodes in the 'A' bin-width.

VK0RTM antenna with local wildlife.

At the time, I was a novice operator, with the call VK5NJF. Norm (VK5ZAH) let me plug a key into his Kenwood and get stuck into some good CW. What a blast! Those memories shall stay with me forever. You just do not hear those types of JA pileups anymore!

Please have a read of the WIA six metre band plan, familiarise yourselves with it, as most of us are aware, there have been on-going problems for 'years' in respect to the 'calling frequencies'. Please remember that 50.110 is the international DX calling frequency, and 50.200 is the domestic calling frequency.

It is important that we observe this band-plan, as by doing so, it will minimise on-air friction and makes it *better* for everyone. Want to call another VK? Use 50.200 - if we *all* do this, it will be terrific.

The six metre band restriction of RF output in the eastern states needs to be addressed, as the TV transmitters that hindered full legal output, have now ceased broadcasting. I will be making representation to the WIA to find out what the current status of this situation is. The ACMA need to allow for 400 watts PEP for all VK stations. I suggest that you all write to or email the WIA requesting that the ACMA get the LCD changed.

March activity is not what you would expect at a solar cycle maxima. In fact, the figures started rising slowly during the second week. They then gradually decreased again!

All the 'die-hard' operators that have borne witness to many preceding cycles say this one is a NO SHOW. Only a handful of VK-W land QSOs so far, one VK4 to UX. TEP in its various forms has been giving a handful of VK4 and VK8s some propagation into JA, HL, BY etc. The equinox has helped in the tropical zone, as VK8AW shows below.

VK0JJJ at Mawson station, Antarctica. Craig reports that the Beacon VK0RTM is on air. Craig is QRV on six metres. VK0RTM is on 50.300 MHz, running 50 watts into a pair of loops. Craig said on the 26th March 'I have replaced a faulty power supply on the beacon VK0RTM today and the revised output power is now 280 W EIRP'.

Meteor Scatter has its usual regular followers, and some others that pop in from time to time: VK7s DD, DX, AB, XX and JG , along with VK1RX, VK3AUU, VK3XDX, VK2s BLS, ASY, Also VK5s PJ, PO and BC and VK4s CZ and WTN would on most occasions swap a signal report or two between each other. We congregate around 50.200, and sometimes 50.190 is used. Several stations also use 50.230 for digital modes. If you get up early, have a listen.

Sporadic E. This propagation has been *very* sporadic, with several brief openings between VK5 and VK6. On 19th March, VK5BC and VK5PO worked VK6s KXW, OX, AKT, JJ and a few others. VK5AKR reported hearing the VK4RGG beacon at 11:35pm local time on the 16th of March. No other Sporadic E reports were received.

EME. VK6OX, VK8AW and VK5PO have made several contacts to various stations via the Moon.

VK6OX worked ES6RQ on the 25th March, at 2010Z.

VK8AW worked W7CW on the 25th March at 0854Z.

VK5PO worked K2ZD on the 1st March at 1202Z, ES6RQ on the 22nd at 1640Z, G4IGO on the 23rd at 1658Z and G8BCG on the 25th at 1903Z.

Gary VK8AW sends in his six metre log – approximately 15 DXCCs!

This month (March) has seen a good increase in activity on six from here in Darwin.

7 March – worked KH7Y (Fred) at 0710Z on CW, BV3CE worked at 1150Z on SSB.

11 March – worked JA1QOP at 1210Z on CW. The band then shifted west and I worked DU1EV at 1215Z on CW, followed by BU2BO at 1225Z on SSB. Then at 1228Z, JR2HCB came in on SSB followed by Dave A92IO at 1345Z on SSB. The band went short and at 135Zz Rodger 9W6RT on SSB, followed by Chris A45XR coming in at 1420Z.

12 March – worked Dan VR2HF at 1220Z on CW S8 followed by 9M6YBG in East Malaysia at 1355Z on SSB, then Ran BV2DQ on SSB at 1350Z.

15 March – worked Seiva KH0XH at 1320Z on CW from the Mariana Islands, followed by Joe KG6DX at 1325Z on SSB S5.

17 March – worked Manfred H44G at 0545Z on SSB.

24 March – worked Alan E6RQ at 0428Z on CW, followed by KH9/WA2YUN at 1100Z on SSB for a NEW one! Then KG6JDX from Guam came in at 1100Z on SSB!

Maybe we need to 'head north' to get in amongst some of that excellent DX!

Please submit reports, logs or other info you may consider useful to John VK5PO at *vk5po@wia.org.au*

SOTA

Bernard Petherbridge VK3FABA and Allen Harvie VK3HRA

The chaser

Summits on the Air (SOTA) is an award program that encourages amateurs to make contacts in the mountainous outdoors. Amateur radio operators climb, walk or make their way by non-motorised to the top of prominent summits and operate on various radio bands thereby activating that summit. SOTA has been carefully designed to make participation possible for everyone. There are awards for activators and chasers.

- Activators hike up to the registered SOTA summit and activate the location by setting up a station and making contacts with a minimum of four different stations.
- Chasers can operate from home, portable or other SOTA locations and make contact with activators. Short Wave Listeners are chasers who hear but do not contact activators.

SOTA chasing may be the fastest growing activity in amateur radio today and there could be many reasons why someone decides to only chase SOTA activations and not actually participate as an activator. One obvious reason is ones proximity to designated SOTA summits and another might be mobility restrictions. The chaser does not require any specialist equipment or fitness to get started and in most cases your existing equipment will allow you to start earning points immediately.

The number of points gained for a contact depends on the height of the summit and each summit has a reference number. Points are awarded to chasers for each contact made, but the summit points can

only be earned once per summit per UTC day by the chasers. Therefore, if a chaser works a SOTA station on a summit they might score 10 chaser points but they will not qualify for any more points from that summit on that same UTC day, even if it is with a different station or different mode. You can still record the contact of course but you don't get extra points.

Certificates are awarded for 100 points and upwards (250 and 500, then higher in proportion to the lower certificates), with the coveted award of 'Shack Sloth' for 1,000 achieving chaser points.

Congratulations go out to Peter VK3PF on gaining 'Shack Sloth' status. This is the first 'Shack Sloth' award going down under. Peter, who is also an active activator and heavily involved in the promotion of SOTA, gained this award in just over 12 months.

The first source of information for SOTA in Australia is the Yahoo group. The link is *http://au.groups.yahoo.com/group/SOTA_Australia* You don't need to have a yahoo ID to join the mailing list, but it is recommended as it lets you look at shared files and photos. To join the group, send an email to: *SOTA_Australia-subscribe@yahoogroups.com.au*

To participate in SOTA you will want to register on the two SOTA websites. The websites are split into two separate entities as one holds the summit and results data and the other spots, alerts and forum. Whilst you can access either website and view results, spots or upcoming alerts, you will not be able to record your own contacts, add spots and later add alerts without having an account.

Go to: *http://www.sota.org.uk/*

Select the *Joining In* menu item at the top left to gain some basic information to get you started.

You can also check out the *Rules & Guidelines* and the *Associations* link takes you to the specific Association Reference Manual (ARM) for your location.

Peter VK3PF's Shack Sloth certificate (below) and trophy (above).

The ARM details the summits for that area e.g. VK3.

Creating an account is easy and does not have any cost or obligation to participate at any level. Your details will be kept confidential and used solely for the purposes of managing the SOTA scheme. They don't pass details on to any other party, nor will you receive any 'Junk' mail as a result of registering.

To register as a SOTA participant you need to provide a username, password, name and callsign to create your account on the SOTA Database Website. You will also need to provide similar information to create an account on SOTAwatch. Note that your username and password on SOTAwatch and the SOTA Database are separate and may be different. I recommend you use your name for login as this allows your callsign to change over time with the points being recorded against you. Your Callsign is used by default on SOTAWatch.

We will first deal with the main SOTA website. Simply select *Database* from the menu items or point your browser to: *http://www.sotadata.org.uk/*

Select *Logon/Logoff* then the *Register* menu item.

Insert your callsign or name as the user name and fill the remaining details as requested. Then select your home association from the drop down list. The VK associations are near the bottom of that list.

Click *Register* and you are done.

There are lots of tips, advice and information on the awards scheme so spend some time exploring the data available. Menu items of interest include - Summits, Results and SOTA Mapping, or just check out the relevant rolls of honour to see how all SOTA participants are faring.

You will notice that the site will 'time out' after period of inactivity, even if you are logged on.

Having gained access to the results database the next step is to create an account on the SOTAWatch site and get familiar with the tools that will help you bag an activator.

From the main sota.org.uk site select *SOTAwatch* or point your browser directly to: *http://www.sotawatch.org/*

When you open the home page you will see that the page is split into two main sections. On the left will be the latest spots showing the callsign of the activator, the time spotted, the summit reference for the mountain they are on, the frequency currently using and usually a comment from the spotter whose callsign will appear at the end of the comment.

Below the Spots are the Alerts that give you an update on coming activations. As these are global lists it is interesting to note the level of activity in other countries as well as comments regarding weather conditions on overseas summits.

On the right hand side of the page you will find the Reflector. This is a forum where SOTA participants share ideas, interesting topics, posted activation reports or ask for advice.

To create an account on this site, click on the *Register* link at the top of the page and follow the prompts. Your callsign is used as the login ID for this site by default. Select a password you can remember and click *create account*.

When you look at the top of the SOTAwatch web site and you will see several links of interest. Take some time to investigate these different options.

Once the account is created, it is time to learn your activator's pattern of operations.

By following SOTAwatch it will not take long to become familiar with the local activators and their pattern of operation. For example a high point summit is generally more difficult to access hence an activator will achieve one in a day but some locations are easier and thus a multi-summit activation is possible.

40 m and 2 m are popular bands with the main calling frequencies being 7.090 kHz LSB, 146.500 MHz FM and 144.100 MHz USB.

One point to note is the day is defined as UTC so 10:00 am (EST) is the changeover. This is proving a popular time for activators in VK as it allows contacts made before 10.00 am and after 10.00 am to qualify as two separate days, earning double points for the chasers (but not the activator).

Whilst the best source of information as to current activations is the alerts on SOTAwatch, APRS can provide accurate information as to an activator's status. Activators that use APRS will usually notify with their call sign in the detail for the alert and group notices. Follow APRS on: *http://aprs.fi/*

It will not take long before you are familiar with SOTAwatch and reading, and understanding, the Spots page. You will have your log ready and will have reviewed the alerts so that you are aware of planned activities. The Yahoo group also has had traffic regarding activity, often from the planning stages. So now you are monitoring the frequency stated in the alerts only to find it is occupied by another user. Don't despair as the activator will come up usually ±10 kHz of stated frequencies or you will see Spots popping up as other chasers make contact.

Quickly moving to the frequency noted in the Spots you may be greeted by either stunned silence or, increasingly, a feeding frenzy. Maybe you can hear other chasers calling the activator but you can't hear the summit station yourself. Be patient. If there is a pile up wait your turn. Activators will work through the list. If there is silence then scan around. There may be a station already on frequency that has resulted in the activator moving or the activator may have jumped to another frequency to gain a 'summit to summit' contact for themselves. Typically they will be back to their nominated frequency in a short time.

Recording the QSO

Validate each QSO by accurately logging the UTC time, the callsign and confirmation of the SOTA summit reference from the activator. Any other information is optional.

If you're the first to contact an activator then you should add a spot to help others. This is a simple process and you would have the required information already.

Point your browser to: *http://www.sotawatch.org/* , login and by default you will be on the Spots page. Select *New Spot* and you will be presented a new page. The activating callsign is their callsign, the summit reference is Association/Summit (for example, VK3/VC-024 for Mt Beckworth) and, finally, the frequency and mode. The spot will appear and you have just helped an activator to qualify the summit.

Whilst most amateurs use logs, is it desirable to record the contact in the on-line SOTA data-base. Scores for both the activators and chasers are entered into the SOTA database where a running total can be found along with other information such as how many unique summits you have worked. To record the contact go to: *http://www.sotadata.org.uk/*

Select *Submit Log* then the *Submit Chaser Entry* menu item. You will be prompted for your callsign and password then a summary of your status will confirm successful login. Select *Continue* to proceed to the entry screen.

Once you have selected the correct summit the contact details will present themselves. The time is in UTC and 'S2S' is referring to a Summit-to-Summit contact. Unless you are on another SOTA peak then don't worry about this checkbox. As the SOTA bug bites you will be considering activating summits yourself.

SOTA is a level playing field. Once you are portable and carrying your equipment, an 'F' call has as much clout as an Advanced call. Go mobile. Go portable to a high spot near to you. Don't worry about selecting a SOTA peak, just going portable can reduce your noise levels compared to those you experience in the shack. Practice portable operations to test yourself and your gear, as soon enough you will be on a summit dealing with the pile up.

More about activating next month.

Good luck and welcome to the fascinating world of SOTA chasing.

Spotlight on **SWLing**

Robin Harwood VK7RH
e *vk7rh@wia.org.au*

Winter's chills have arrived and this means I hope to be spending more time listening on shortwave. The gaps are becoming more noticeable because on Easter Sunday, March 31st major broadcasters such as the VOA and the BBC drastically cut back their shortwave presence. South America no longer has a powerful broadcast sender, with the closure and rapid dismantling of the French site in Montsiniery, in one of the few remaining French colonies, French Guiana. Bonaire in the Netherlands Antilles ceased at the end of October, which now means there are no high-powered transmitters for shortwave remaining in South America.

There are quite a number of low-powered senders left but they rarely propagate to Australia. I only managed to work one Brazilian station when I was an active amateur and have yet to hear any of the Brazilian shortwave senders here in Tasmania. This may now be possible with the departure of so many stations in Europe and the Americas. China has actually increased their shortwave output in contrast to the departure of other broadcasters. It is so easy now to hear China 24/7.

Another casualty is the closure of the BBC Cyprus relay in Limasol. These senders have consistently provided signals into the Middle East, Africa and into the former Soviet Union. Arabic programming via shortwave from London has also ceased after 75 years of programming. The reason for these measures at both the BBC and the VOA is a result of severe budget cutbacks. It is also rather ironic that Limassol closed down in the same week as the financial crisis within that small island state caused a massive run on the banking system, leading to EU and IMF intervention. Cyprus remains on HF because of the continuing presence of the extremely strong 'over-the horizon-radar' (OTHR) pulses from Akotiri.

Intentional jamming has also increased despite the departure of so many from HF. Monitors have alleged that some of this QRM may be from China and also North Korea. The BBC came out with a statement alleging that the BBC World Service in English was being deliberately jammed from inside China. Even All India Radio in Chinese and Tibetan has been targeted. The jamming seemingly coincided with meetings of the Chinese parliament in Beijing.

North Korea has been jamming broadcasts in Korean form for many decades. Their main targets naturally are from South Korea and the VOA/Radio Free Asia from Washington. In recent years, the Japanese have commenced broadcasting to North Korea in support of citizens who were allegedly abducted by North Korean agents. Broadcasts are a mixture of Japanese and Korean and sometimes in English. The latter is extremely difficult to understand and I personally think it doubtful that there would be very many who would comprehend through the consistent white noise QRM.

I was able to attend the annual 'Sewing Circle' BBQ at Ross, in the Midlands. It was a cold windswept March day with heavy rain squalls. We all adjourned to the 'Man O'Ross' Hotel where we thawed out. It was great linking up with many amateurs I have spoken to on-air over my 41 years of amateur radio. I personally was taken aback by Justin VK7TW who presented an award to me for Outstanding Service to the hobby. My sincere thanks to the informal membership of the 'Sewing Circle' net, which has been active for at least 55 years. I can recollect hearing it in the late 50s, when I was still a boy starting out listening. I remember checking in to 3590 from the 1970s through to the mid-90s, when my HF amateur activity ceased. I would also like to publicly thank VK7PD and Ivor for kindly transporting me to and from Ross.

Well that is all for now. Don't get discouraged by the depleted number of shortwave broadcasters. There is still plenty of activity about. Keep monitoring!

Participate

Harry Angel Memorial	4 May
VK/Trans-Tasman 80 m Phone Contest	11 May
VK Shires Contest	8/9 June

Hamads

WANTED – VIC

Z-match or swinging link-type antenna coupler, suitable for matching balanced line to 50 Ω co-ax. This is required by a pensioner amateur. NB: A E F Johnson Matchbox would be great.

Please contact John VK3ZK QTHR, mobile 04 6699 4856 or *jlwickham@aapt.net.au*

WANTED – NATIONAL

The WIA Archive continues to seek copies of early Australian radio magazines containing aspects of our history and in particular those which were associated with the Institute.

Radio Experimenter, Experimental Radio & Broadcast News and **Radio Broadcast** were monthly magazines produced during the mid 1920s.

H.K. Love and Ross Hull were responsible for their production, initially from Melbourne, but moved to Sydney in October 1925.

Please contact Peter VK3RV via email *vk3rv@wia.org.au* or c/o the National Office in Bayswater if you can help us locate copies of the above magazines.

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*

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- 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.
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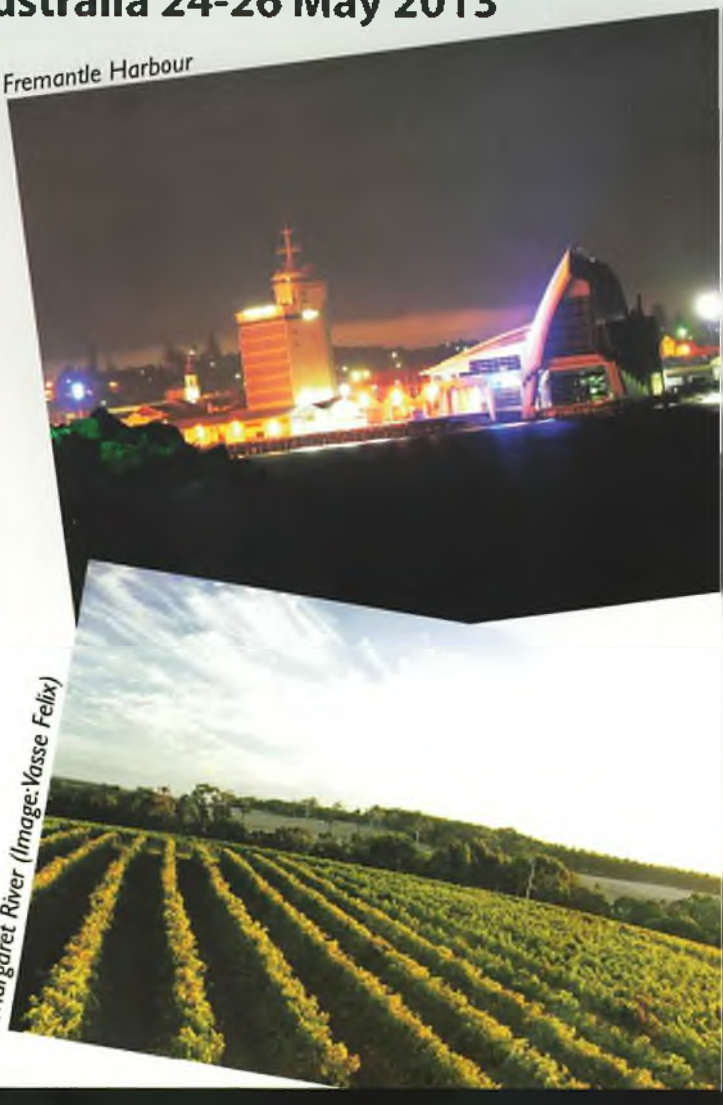
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