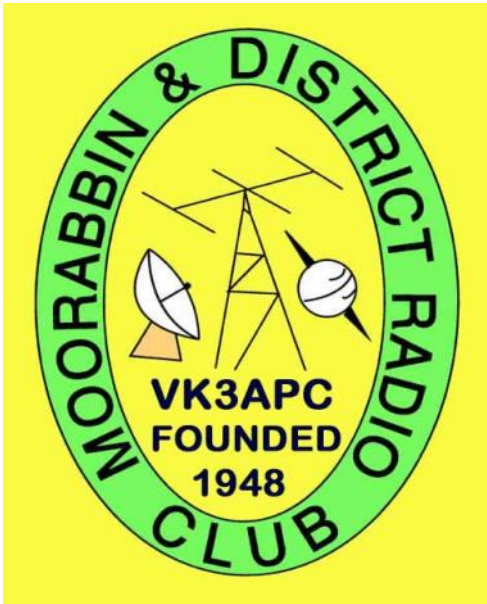


APC NEWS



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KAYE VK3FKDW SK

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EDITORS AWARDS



Lunching at the McCrae light for the 2017 Lighthouse Weekend.

Kaye VK3FKDW (SK), Ian VK3IFM, Denis VK3BGS, Gerard VK3GER. See Obit inside.

QTC

This year started with the unfortunate death of Kaye VK3FKDW—see elsewhere in the magazine. On the positive side building the Pixie transceiver has created a buzz in the Club. All involved learned valuable lessons. Six have working transceivers, six are still learning. Those that continue will no doubt learn more even if they never get it to work. (As Dirty Harry said not all cats want to run with the herd.)

We have another SOTA activation coming up and then we have to decide on the next activity.

We also need speakers for the Friday night meetings. Should we have a speaker every second month? FEEDBACK PLEASE.

TRADE DISCOUNT;

If you want a discount card you need to have your photo taken and provided to the Editor who is doing the cards in the absence of the Treasurer..

CORRECTION:

In the last issue the Speaker Reports were misnamed by a month. The “August” talk was actually in September and the “September” one was in October. The error was the editors. Sorry.

QTC

REMINDER

Night meetings, Second Friday in the Month. Please come along and listen to our speakers. Enjoy a cuppa, a biscuit and a chat.

Day meetings, every Tuesday from 9:45 on. Chatter and coffee time to 10:30. Reports, requests, show and tell to 11:00. Attendances are around 20 on a regular basis and Convenor Leon provides plenty of joviality.

This is your Club. If you want a particular activity, ask.

73,
Ron, VK3AFW,
APC News Editor.

COMING UP

Tuesday 18th February. Three peaks SOTA expedition

Friday 13th March 2020. IARU Update, Peter VK3MV

Updated 23 Jan 2020

KAYE VK3FKDW A SK



Kaye Wright VK3FDKW our Club Publicity Officer, ALARA Secretary and stalwart and immediate past Secretary of the WIA Publications Committee passed away on 15th January 2020 in Bethlehem Hospital having been admitted on 27th November.

Kaye grew up on a farm at Barmah East in the 1950's. She qualified as a nurse in Bendigo and worked in the hospital there for a number of years. Later, she and her husband set up a Taxi Truck company that still operates today. While in Bendigo Kaye took to scouting with gusto when her son Greg was old enough to join. Later she took on a variety of jobs after parting from her husband. These were in part ones of convenience as she still had a son to raise. The farming and nursing background meant she would take on any job master it and work hard at it.

Kaye was a keen lawn bowler at a time when younger people were not common on the rink.

KAYE VK3FKDW A SK

After meeting Denis VK3BGS just over 10 years ago she was exposed to amateur radio. A foundation licence was soon passed and Kaye became involved in the M&DRC, ALARA and the WIA. She had a sunny disposition and was a much appreciated asset to all groups she associated with.

Many members went to the annual Club Christmas Party just for a slice of one of her cakes.

In 2018 Kaye had some health issues and it was then that she was diagnosed as having Motor Neuron Disease. She battled gamely with as much involvement as she could muster in ALARA, the Club and bowls but, inevitably, the disease overcame her.

Thank you Kaye for your companionship and contributions, we miss you.

The Club extends its condolences to Denis.

ANTENNA WORKING BEE

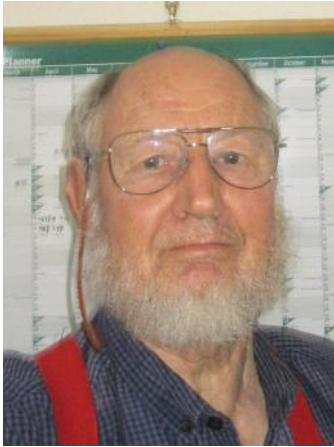


A working bee to complete the repair of the Club's HF beam was successful.

Here we see Ken VK3KIM on the ladder, Lee VK3GK, manoeuvring a cable and working on the VHF antenna Alan VK3VZS and Alby VK3VBP.

Also present were Paul VK3PDC, Shane VK3FBMD, Terry VK3YX, and Ron VK3AFW.

GUEST SPEAKER: FEBRUARY



Ron VK3AFW

Matching by Adjusting Feeder Lengths

There are many occasions when we do not have a low SWR at the shack end of the feedline. On HF especially we can just call on our ATU to perform the necessary adjustments. Sometimes we do not get a match no matter what is done with the ATU.

If we have an antenna analyser we can measure the impedance and plot it on a Smith Chart. Using a compass we can then draw a circle centred on the centre of the chart. If for example the measured impedance is very low then adding up to a quarter wavelength of feeder will transform the impedance to something higher.

The Smith chart will show how many electrical degrees of feedline are required to get into a matchable value.

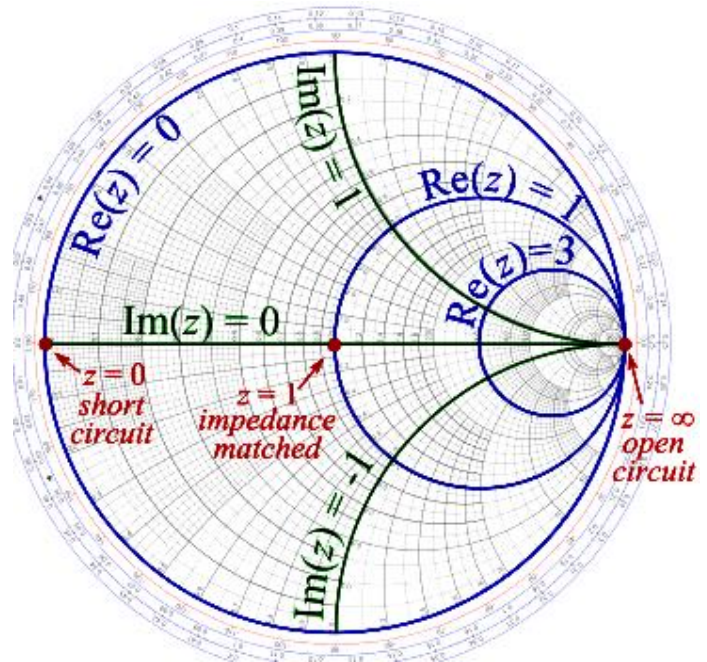
Of course you could just add 2 m to the feedline and try tuning again. If that fails try 4 m, and so on.

GUEST SPEAKER: FEBRUARY

Matching by Adjusting Feeder Lengths cont'd.

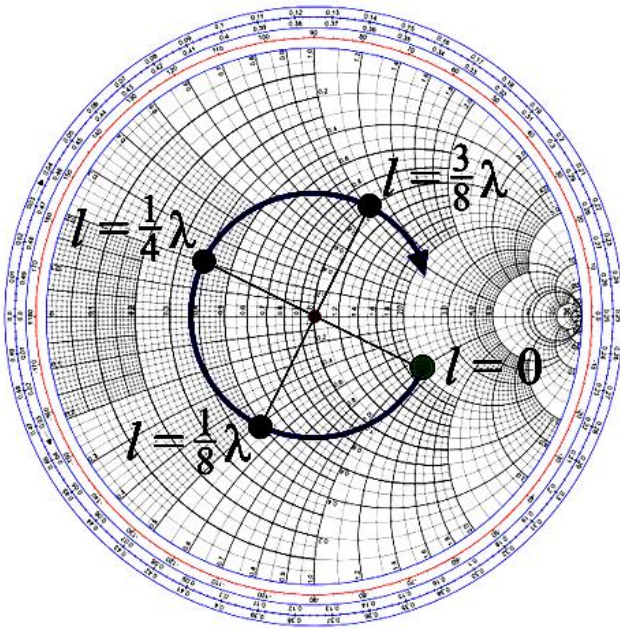
The Smith Chart graphically represents the impedance along a transmission line. The centre represents 50 ohms in this case and the far left, on the horizontal centre line, 0 ohms and at the far right infinite ohms. Above the line inductive and resistive values can be plotted and below the line capacitive and resistive values.

Travelling along a line we see the voltage/current values and phases (impedances) repeat every half wave. One rotation around the chart is a half wave or 180 degrees.



GUEST SPEAKER: FEBRUARY

Matching by Adjusting Feeder Lengths cont'd.



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Travelling along a line we see the voltage/current values and phases (impedances) repeat every half wave. One rotation around the chart is a half wave or 180 degrees.

On the left we see an impedance plotted at $l=0$. The circle centred on 1 on the chart represents a constant SWR circle. Changing the feed length does not change the SWR but it changes the impedance. At one length the feeder exhibits a 23 ohm resistive value which should be easy to match.

TESTING YOUR PIXIE

FIRST THINGS FIRST.

Do another check to see that all parts are in the right place. If you can get access to one that is complete and working OK then do a careful visual inspection to see that the parts in each position look the same. Otherwise use the parts placement diagram that came with your kit. It's a real life "Spot the Difference" puzzle.

Check your soldering to see that there are no dry joints and no solder bridges to adjacent pads. Check that all pads are properly soldered.

If you have substituted another transistor for one of those supplied did you understand that the pin connections are as read from UNDERNEATH? Get that wrong and it's goodnight transistor as soon as you power up. In milliseconds.

NOTE: The main reason for substituting a TO5 can transistor for the plastic cased PA is to avoid the need for a heatsink. Some builders have reported that when holding the key down for more than a second the supplied PA transistor gets very hot and the power supply needs to be reduced to 10 to volts.

TESTING YOUR PIXIE cont'd

You may get a little more power out with a higher power gain transistor in the PA but that is not the main reason for a substitution. If it is a VHF or UHF type then you need a couple of ferrite beads on the base lead to suppress parasitic oscillations. Because it is a two stage transmitter the power out is always going to be modest. The Frog Sounds kit is like the Pixie Kit but has a driver transistor, a bigger PA with heatsink and an improved receiver. It gives about 10 dB more power as might be anticipated.

Check that the reverse polarity protection diode is in the right way.

Get a working straight key with the appropriate plug.

Get a working pair of headphones with the appropriate plug.

Make up a dummy load. Two 100 ohm 0.25 W resistors in parallel will do.

Get a fuse-protected or current limited power supply. Anywhere from 9 V to 13.8 V is suitable. Be wary of key down with the higher voltage. A 250 mA fuse/250 mA current limited supply will limit the damage if you have goofed.

Get another working Pixie or a 40 m CW receiver.

TESTING YOUR PIXIE cont'd

FIRST STEAM.

Connect the pixie to the load, headphones, key and power supply.

Turn on the power to the Pixie. If the fuse/current limit operates you need to go the fault finding section.

Assuming there is no apparent problem, tuning the external receiver to 7.023 MHz should provide a clear beat note. This is leakage from the Pixie local oscillator and is normal.

Pressing the key briefly should result in a strong signal on a slightly different frequency.

Check that the current drawn is reasonable, say 80 to 200 mA.

Send a series of ditz and check that the note is clean and chirp is minimal.

Zero beat the monitoring receiver on the Pixie transmission frequency, taking care to use minimal key down time.

TESTING YOUR PIXIE cont'd

In the receive mode adjust the pot to give a pleasant tone on the external receiver. If another Pixie is now keyed you should hear a similar tone in the headphones of your set. If you key your Pixie (with load connected) you should hear a similar tone in the headphones of the other Pixie if it is properly set up..

Carefully check how hot the PA transistor gets. A finger can be used but ONLY FROM A COLD START. Try a few ditz and if not hot, then a few dashes. DO NOT PUT YOUR FINGER ON A PA TRANSISTOR THAT HAS BEEN WORKING HARD. YOU MAY SUFFER A NASTY BURN.

If necessary add a heatsink.

Use a diode and DMM or a 50 MHz CRO/DSO to measure the voltage across the dummy load with the key pressed.

Output power is the peak voltage squared divided by 100. You should see between 3.2 volts and 7.1 volts which is 100 to 500 mW.

TESTING YOUR PIXIE cont'd

The receiver can be checked by listening for another Pixie as described earlier or by connecting an antenna. An increase in the background noise should be heard. If you are close to a broadcast transmitter and can hear unwanted signals you may need to make a small modification as devised by Sverre LA3ZA, <http://la3za.blogspot.com/search/label/Pixie2>

FAULT FINDING

This section lists some possible faults. The corrective action should be clear once the fault is located. Contributions are invited.

- 1 Excess current from power supply in receive mode.
 - Protection diode around wrong way?
 - Solder bridges across the supply rail around S1, C1, CP1?
 - PA transistor has been abused and is now a low value resistor.

- 2 No tone heard from Pixie in Rx mode on external receiver:
 - Fault with the crystal oscillator.
 - Check for correct component wiring, no dry joints and correct values.

 - Check that the emitter of Q1 is about 0.6 V lower than its base voltage and the voltage across R4 is roughly half the supply voltage. Q1 may be faulty or something wrong with R1.

TESTING YOUR PIXIE cont'd

If no fault so far the crystal might be faulty. Tack a good one across the terminals to check.

- 3 Tone heard in external receiver when Pixie is in receive mode but no output when keyed.

Does the supply current change when the key is depressed?

Check wiring to the key and around that part of the pcb.

Is the PA transistor in the right way? If around the wrong way the base emitter junction may now be open circuit.

Is the supply voltage more than 9 V when key is down? Only alkaline batteries can hold up under tx load. The cheap rechargeable ones fall to 7.5 V or thereabouts which is inadequate.

Some units may need 10 V to work satisfactorily. Check voltage is adequate.

Most PA transistors do not last long if keyed without a load. NEVER transmit into an open or short circuit.

Check voltages on Q2 in receive mode. Full supply voltage on collector, 1 to 3 volts less on the base and 0.6 to 0.7 volts less than the base across R5.

TESTING YOUR PIXIE cont'd

- 4 No audio on receive when another working Pixie is keyed nearby.
 - U1 inserted the wrong way. If so may now be dead.
 - Wiring error with U1 components?
 - Wiring error with phone socket?

- 5 Audio note does not change when pot is adjusted.
 - Voltage across pot should be the same as on the PA emitter.
 - Wiper voltage should vary from 0 to above voltage when the pot is adjusted.
 - Voltage across D2 should track the pot wiper voltage. If it holds at 0.6 V the diode had been installed back to front.

TESTING YOUR PIXIE cont'd

ON AIR WITH THE PIXIE

The CW Training Course last year was run before this building exercise for a reason. You need CW skills to use the rig for contacts.

You need a resonant or tuned 40 m antenna, key and headphones plus a power supply or battery.

While you may get some random contacts it will be slow going so some sort of alerting is recommended. I use my Pixie on SOTA activations and post my frequency and availability through the SOTAWatch3 web page. The VK ParksnsPeaks online alerting service is great too. And of course there are special QRP events where you might get a few contacts. Or you could make a sked with a Club Member.

A certificate will be issued for any member who presents evidence of a QSO with their Pixie. Endorsements for higher numbers of contacts will be issued.

VK3AFW
Jan 2020

BACKYARD DOUBLETS

Many new amateurs and some old ones make the mistake of putting up too many antennas. For the frequencies below 14 MHz a doublet is a great choice. No traps, just a single wire fed in the centre.

The doublet requires a wide range Antenna Tuning Unit. This resonates the radiator and feed-line to produce an efficient antenna. Various attempts over the last 100 years have been to eliminate the ATU. Here are the two best known examples.

The G5RV doublet

Invented by Louis Varney in 1946 it was popular for maybe 20 years when pi couplers were common and VSWR did not worry most folk.

It consists of a radiator 102 ft. long fed at the centre with a half wave (on 14.2 MHz) of 300 ohm feeder. This is typically 27 ft. 8 inches long – velocity factor typically 0.8. The bottom of the 300 ohm feeder is connected directly to 72 or 75 ohm coax. The feed impedance at the antenna is a bit over 100 ohms although this varies with height above ground. The half wave of feeder presents the same impedance to the coax as it sees at the feed point. The SWR would be 1.5:1 typically.

BACKYARD DOUBLETS cont'd

Connecting 50 ohms instead of 75 ohms will result in a best SWR of maybe 2.2:1. The internal ATU in modern rigs will flatten this out so it's OK.

It is reasonable to cut to length and then erect the antenna at 35 ft. in the centre, higher if you can with the ends at 20 ft. or more. Now the typical ATU will match up on 80 m and 40 m plus some bands above 14 MHz, giving 4 or more bands. Expect trouble trying to match it on 30 m and 15 m.

The ZS6BKW doublet

Brian Austin ZS6BKW decided to do some computer simulation to see if he could modify the G5RV to make it work on more bands without an ATU. He succeeded, sort of, by reducing the length of the radiator and increasing the feed line length.

A commercial version uses a 90 ft. doublet centre fed with 40 ft. of 300 ohm ribbon connected to a 50 ohm feedline. It needs an ATU on 80 m but can be used without one on 40 m, 20 m, 17 m and 10 m.

It is a good compromise especially if you have no ATU or one of the built-in-the-rig ones. I once found myself in the field with a non-operational ATU and successfully used the ZS6BKW on 40 m with less than 2:1 SWR.

BACKYARD DOUBLETS cont'd

The All Band Doublet.

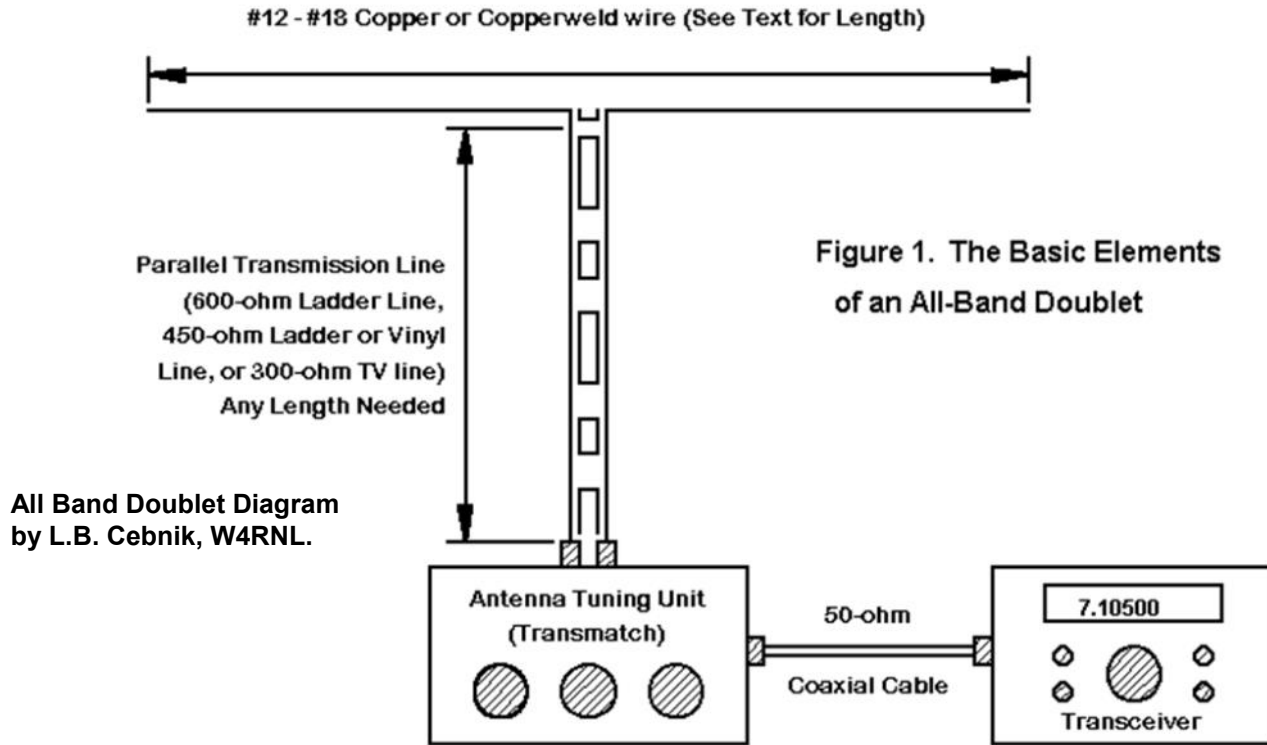
This was devised about 100 years ago and still works as well as ever. It is a doublet with the radiator being anywhere from 85 ft. to 140 ft., whatever fits in your back yard. If it is shorter than 85 ft. it will be less efficient on 80m, indeed the closer it is to 135 ft. the better it will tune on 80 m. Feed it in the centre with 300 ohm ribbon, 450 ohm ladder line, or 600 ohm open wire line. Like the radiator length the impedance is not critical.

The feedline length is as long as is needed to reach the shack. Put a 1:1 balun or fry common mode current choke at the transition to coax to the rig. The SWR will be high on the feedline and a short run of coax is suggested in the interest of keeping the losses low. SWR losses in feeders can increase the basic matched loss by 10 or even 100 times depending on the SWR

If the ATU cannot match the antenna system, changing the feedline length will present a different impedance that the ATU may handle. Anywhere from a metre to an electrical quarter wave length may be required. Having sorted the problem band the other bands will likely be little affected.

I use LDG external tuners and find they can handle my worst SWR, 50:1 on 3.5 MHz, and I can work most people I can hear.

BACKYARD DOUBLETS cont'd



BACKYARD DOUBLETS cont'd

My home doublet length is chosen so as to provide a half wave on 5 MHz. It just fits in in my yard. My portable one to have a full wave resonance on 10.1 MHz (95 ft.) as I want to have best performance there. The feedline is trimmed to a quarter wave on 10.1 MHz (23 ft. 6 inches) for 300 ohm feeder).

The doublet should be installed as an inverted vee for better DX performance and reduced nulls.

For the home station I used heavy current electrical earth wire with insulation for the doublet. The OWL was made from the lower current earth wire with insulation and spacers cut from plastic garden stakes. The wire was held in place with cable ties and roof and gutter sealant. The ATU is actually remote to the shack and is powered by dc down the coax.

Advantages of the All Band Doublet.

Works well from 3.5 to 18 MHz, useable up to 56 MHz and in an emergency, 2 m.

Low visual impact, single wire radiator with single feedline.

Similar performance to a monoband dipole from 3.5 to 18 MHz. (Field tested against a link dipole).

Power rating 100 W with 300 ohm feeder, 400 W with 450 ohm feeder, 5 kW with open wire line. I run 75 W FT8 or 100 W SSB.

BACKYARD DOUBLETS cont'd

Feedline losses with Open Wire Line calculated to be less than 0.5 dB across the whole useable range. ATU losses depend on ATU.

With a decent radial ground system can be fed as a vertical on 160 m and 600 m.

Low cost, all parts available from Bunnings, etc.

No traps to tune or critical lengths to prune. Build and operate.

Disadvantages of the All Band Doublet

Requires a wide range ATU (LDG brand or homebrew Z-Match)

Balanced feeder needs to be kept at least 4 inches clear of any metalwork and sharp bends avoided. (I moved my feed point several feet sideways to be clear of the tower).

Needs a 1:1 balun to stop common mode currents (keep RF out of the shack).

May need a 4:1 balun to match all bands at some heights.

Performance is height related – too low and it won't tune or radiate properly. **Remember:**

Low antenna, low signals, high antenna, high signals.

Useful Reference: <https://ftp.unpad.ac.id/orari/library/library-sw-hw/amateur-radio/ant/docs/Introducing%20the%20All-Band%20Doublet.htm>

VK3AFW Feb 2020

EDITORS AWARDS 2019

CLUBMAN OF THE YEAR.

The member who made a notable contribution to all the Club's activities:

Alby VK3VBP, helping at all meetings and other activities.

CONSTRUCTOR OF THE YEAR

The member who impressed most with their construction:

Ian VK3XI, valve tester.

Honourable mention, Paul VK3PDC, valve transmitter.

APPLIED SOFTWARE

The member who produced the most useful software and associated hardware:

Roger VK3KYY, Radioddity HH software, RS918 software and software for Pixie VFO.

Honourable mention, Ben VK3FBCN, CW trainer.

STOP PRESS NOTICE

From our Webmaster

Not sure if you have taken a look at the MDRC recently or been told, but Hamfest bookings can now be made online and I have done a bit of a refreshed format of the website.

The website is in a new framework which I use at work for all new websites which makes updating a lot easier, flexible and more mobile-friendly.

The bookings for the Hamfest can now be done online similar to what EMDRC do. You book and pay all online for your table(s). Payments can be made via PayPal (which is much preferred) or via Direct Deposit into the club bank account.

Any questions, please let me know.

Kind Regards,
Cohen

TRADE DISCOUNTS

FOR CLUB MEMBERS at ALTRONICS and JAYCAR.

Moorabbin and District Radio Club Inc. members can now buy over the counter at **Trade prices** from both **Altronics and Jaycar**. When making a purchase ask for **Trade Discount** and for **Altronics** quote the Club's Trade account number **32323** and your **call sign** or for **Jaycar** quote Customer Number **45400209**. **This is NOT a charge account so you use your money.**
Note: Minimum purchase of \$20 may apply.

Check out these companies at their websites.



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