



# BARG News

*Ballarat Amateur Radio Group*

*Inc. #6953T*

*February*

*Monthly Newsletter*

Next Meeting

**Friday 29<sup>th</sup> January 2016 @ 7.30pm**

At the B.A.R.G. Club House, Ballarat Airport

**All Welcome**



## **Contacting us**

You can write to the club at the address below, or e-mail the secretary

The Secretary : B.A.R.G. Inc.  
Box 1261  
Mail Centre  
Ballarat. Vic. 3354

Or E-Mail : [vk3bml@barg.org.au](mailto:vk3bml@barg.org.au)

We're on the web  
[www.barg.org.au](http://www.barg.org.au)

## Presidents Report

Just a short note from the Pres by now we should be used to dating things 2016, yes the start of another year and may it be a safe and healthy one.

Things have not stopped over the Christmas break Jeff PAP has done a beautiful job of installing the tilt over tower so now its up to the beams and vertical to be installed also the remote base is ready to be installed at the club rooms.

The coffee mornings have been very popular with good roll ups on the first two events these occur on the second Thursday of the month at this stage at the Beechworth Bakery. We have decided to have an auction at our next general meeting, we have a large range of items mostly at no reserve.

Thats all for now hoping see a good roll up on the 29th our meeting night.

*Doug Raper*

From the desk of President Doug vk3vba

## Club Net

Are there any club members would like to join the roster of control stations operators on the Thursday night for VK3BML? We need to have one or two more to assist and that would share the load about more easily.

Please contact Craig at [VK3CMC@Bigpond.com](mailto:VK3CMC@Bigpond.com) ASAP.



## AUCTION AUCTION AUCTION

Bring your money for a bargain! Bargains galore at the next BARG meeting, **Friday January the 29<sup>th</sup>**! Lots of goodies with no reserves, so don't forget to stop at the ATM on the way in and fatten up the wallet.



The biggest lie I tell myself is , I don't need to write it down I will remember it.....

SALGUOD

### **A Word From The Editor**

Welcome to the first edition of the BARG newsletter for 2016. I had not planned to publish a January issue as we don't really have a meeting at the end of December. However when I dropped into the break up a few members suggested that it'd be good and so I said I would get one out. As you can see, other things got in the way and it just didn't happen. :-( Hopefully there's a bit extra in this issue to make it up.

Special thanks to Mick for his article on field operations. I must get out and get into that myself! We also have a couple of articles from the archives, including a power supply from VK3CAZ. If anyone decides to have a go at building one I suspect that many of the components, in particular the transformer and large caps, might be able to be sourced from club members. So put your hand up if your interested. All it'll cost is a some feedback to the club in the news letter. ;-)

I've also included a couple of antenna farm pic's. These were emailed out since the last issue. There's always interest in antenna set up, so why not share what you've manged to put up. Perhaps with a few words about performance.

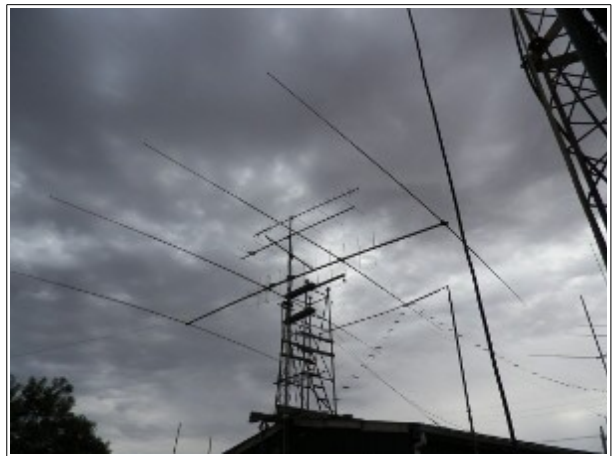
Until next month.

**Malcolm VK3MEL**

### **Antenna Farms**

A couple of healthy antenna farm pics from around the district.

**VK3TZC**



**VK3VBI**



## **6 Metres and Above**

You will notice this reports Title has changed to include the 6 metre band which livens up during this time of the year.

Already there have been some openings between many of the VK States with contacts also into ZL and JA. A simple dipole or ground plane is enough to get going so have a look in your ARRL or RSGB for details or simply look on the web.

Known local stations are VK3WN, VK3AIG, VK3TXR and VK3AXH

2 metres has also seen some sporadic E propagation with contacts between VK3 to VK4 and VK8. Kevin VK3WN reported hearing VK4BLK at Yapoon.

A few weeks back there was a Geminids Meteor Shower which according to the media should have been visible and provided the opportunity for meteor scatter contacts during the early hours. Reports received indicate great success where Melbourne stations reported having in excess of 40 contacts. As a comparison you are likely to around 6 qso's which is still quite good at any other time.

Whilst there has been some activity with tropo and sporadic E around on 6 metres I believe activity is somewhat down at this time according to my own observations and others who are active on this band. Some contacts have been made to many VK States ZL and JA but overall signals are down. There is however an increase in the use of WSPR which is used to see if propagation exists between those that use this mode. Some of the members VK3AIG, VK3TXR and VK3AXH have been involved.

Propagation has also been down on 2m, 70cm and 23cm with only a couple of good openings to Albany in VK6 and Launceston in VK7 with VK3AIG, VK3AXH and possibly others having the good fortune to have made some qso's.

Since my last report there has been 2 VHF/UHF field days namely the November 2015 Spring Field Day where VK3AIG and VK3AXH operated from Mt Hollowback in the all band 8 hour section. As this is a 24 hour event some operation was also done from home on the Sunday where Ian VK3AXH won section Section C2 8 hours operation on 4 bands 2m, 70cm, 23cm and 13cm.

The 2016 Summer Field Day took place on the weekend of 9/10 January where VK3AXH operated in the 8 hour portable single operator section on all bands from 6m through to 10GHz. Notable contacts were to VK7JG on 1296MHz a distance of just over 500km and to VK3WRE Ralph portable in Gippsland on all band up to 5.7GHz with signals up to and over S9.

Some club members were heard from their home stations with Mick VK3PMG being one of the most active stations heard.

VK3AXH operated from Green Hill and his setup is shown below for interest.

Image of Green Hill with bands from 6m to 2.4G on the trailer and the 3 dishes in the foreground being 3.4G, 5.7G and 10G bands. (trig point in background)



## **6 Metres and Above – Continued**

As a single operator some refinement needs to be done to allow remote rotation of the 3 dishes to make computer logging and overall control much easier.

Progress is being made with our 3.4G project when some of the group are leading the way. Both John VK3AIG and Craig VK3KG are close to the testing stage. There is an activity day organised by the Geelong GARC on the 21<sup>st</sup> of February so hopefully we will be organised for that.

Some of the microwave group are getting ready for a 3.4GHz test day in February 2016 involving the GARC. Hopefully there will be a good representation from BARG with the modified 3.4GHz surplus panels that have become available.

If you are interested in this activity contact VK3AXH as there are still some panels available for those that want to get involved.

Till next time 73, *Ian*, VK3AXH

A Englishman and Irishman go into a pastry shop. The Englishman whisks three cookies into his pocket with lightning speed. The baker doesn't even notice.

The Englishman says to the Irishman, "You see how clever we Pommies are? You Paddies can never beat that!"

The Irishman says to the Englishman, "Watch this, any Paddy is smarter than you, and I'll prove it to ya."

He says to the baker, "Gimme a cookie, I'll show ya a magic trick!" The baker gives him the cookie, which he promptly eats.

Then he says to the baker, "Gimme another cookie for me magic trick." The baker is getting suspicious, but he gives it to him. He eats this one too.

Then he says again, "Gimme one more cookie..." The baker is getting angry now, but gives him one anyway. He eats this one too.

Now the baker is really mad, and he yells, "OK ... so where is your famous magic trick?"

The Irishman says .... " Now look in the Englishman's pocket!"



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## VK3PMG Portable Report

Hi All,

I've been doing some portable work on hf, for the Keith Roget award, and also for the World Wide Flora and Fauna in amateur radio award. The Keith Roget award is run through Amateur Radio Victoria by Tony VK3VTH

<https://www.amateurradio.com> and the WWFF awards are run in VK by Paul VK5PAS  
<http://www.wwffaustralia.com/>

These are similar to SOTA, except for those who aren't that agile like me, there is no hill climbing involved, just drive to a park listed for each award, set up and start operating. There is a great web site <http://www.parksnpeaks.org/> where intended activations can be posted, as well as spots when a park activator is heard operating. Very popular site, and spots posted are also sent directly to cluster via a linking process.

My portable set up is an Icom 706 set to 20w, squid pole and inverted vee linked 40/20m dipole, 35ah battery with a 40w solar panel. The dipole is connected using the thin rg174 and has a ferrite donut for a balun at the feed point with the RG174 wound through it, and then running down to the radio. I made a holder for the squid pole which goes under the car wheel.

Great to get out and work portable, I'm really enjoying it.

I've also recently won the Keith Roget Memorial National Parks Award for working all 45 NP's in VK3, and received a merit plaque, which I'm very happy about, very nice award. Awards can be seen on my QRZ.com page.

Cheers and 73,

*Mick*

VK3PMG.



### Junk Box Volt Meter

Here is another little program for anyone wanting to use an available {junk box} meter to make a specific Voltmeter. Maybe used in the work shop across a wet cell battery connected to a radio or scanner or just use it in a old vehicle or boat to monitor the main battery state of charge. It suggests that calibration is done at three different points ie 12V, 9V and 5 Volts. These calibration points can be at any voltage we like especially if there is a need to test things like a fully charge NiCad or NiMh or LiPo battery packs in various equipments around the household.

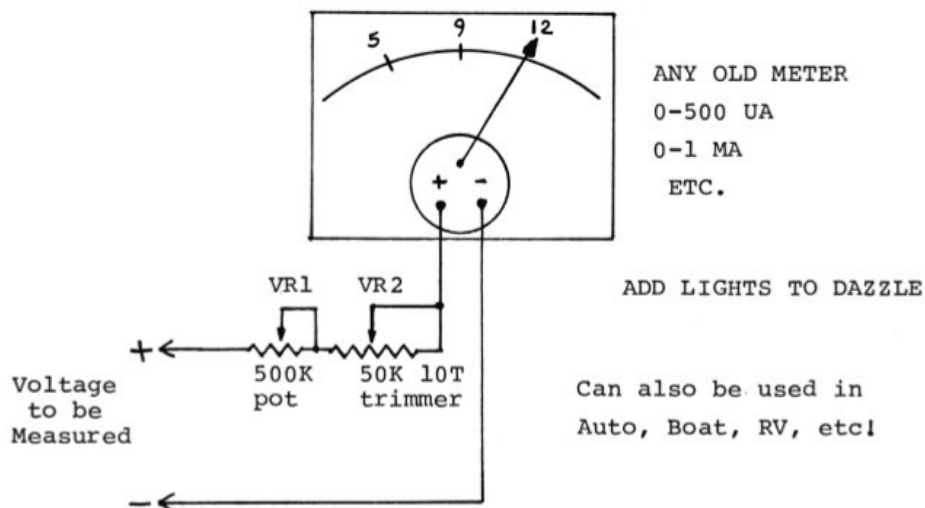
I note one typo error in STEP 3, the word “fun” should read FSD or Full Scale Deflection. This means the extreme right hand side of the meter scale, and in this project they mean for it to read where the 12Volt point is going to be.

I think that this simple voltmeter project should be able to be attempted by all beginners as it makes a special but simple enough voltmeter. The small variable resistors should be clean and be checked with a multimeter before using to ensure they have continuity.

This could be easily done one CONSTRUCTION night in the club if someone requires assistance.

73, *Craig* VK3KG

### HOW TO CONVERT A SALVAGED METER TO A VOLT METER



1. Adjust 500K pot for maximum resistance.
  2. Adjust 50K trimmer pot to maximum resistance.  
NOTE: We wanted our meter "calibrated" at 5 volts, 9 volts, & 12 volts.
  3. Hook up leads to a 12 volt power supply. Adjust VR1 for fun scale deflection.
  4. Adjust VR2 for where you want 12V to be at on your meter. Put a mark at this location.
  5. Hook up leads to a 9 volt battery. Put a mark at this location.
  6. Hook up leads to a 5 volt source. Put a mark at this location.
- Put a drop of "loctite" on the pots to prevent further movement.  
Now you've got a junk box cheapie Voltmeter!

### Timeline for Electronics

Craig's sent in an interesting Timeline for Electronics, up to 1999. These originally came from an internet source [inventors.about.com](http://inventors.about.com). Some US type names have been cut out. There are many other electronic ones that could be added such as Sam Morse and G Marconi. Maybe one day they could be added into the list. I'll add some to each news letter, rather than put the whole lot in one issue.

Thanks Craig!

Around 600BC it was found that rubbing AMBER that It would become charged.

Thales of Miletus had discovered static electricity.

1600 the English scientist William GILBERT using the Greek for amber called it electricity. He published and started using terms of electric force, attraction and magnetic force.

1660 A machine that could make static electricity was designed by Otto von Guericke. The modern day machine is called the Van de Graff generator.

1675 Robert Boyle noted that electric force was able to be transmitted through a vacuum. He also noted the effects of repulsion and attraction.

1733 Charles Francois du Fay found that electricity was in two forms which he called resinous and vitreous. Benjamin Franklin later called them as positive and negative.

1745 A Dutch Physicist Peter Van Musschenbroek invented the Leyden jar which could store electricity.

1747 Ben Franklin experimented with static charges in the air by flying kites during thunder storms. He hypothesized the existence of an electric form that was made up of particles.

William Watson used a Leyden jar to discharge current through a circuit and load. Henry Cavendish also started measuring conductivity of different materials.

1752 Ben Franklin invented a lightning rod showing that lightning was actually electricity.

1767 Joseph Priestly discovered that electricity follows Newton's inverse square law of gravity.

1786 The Italian Luigi Galvani showed that nerve impulses could be produced by electricity to make frog muscles twitch.

1800 First electric storage battery by Alessandro Volta. He also showed that electricity could travel over wires.

1820 Hans Christian Oersted noted the effect on a compass needle when current flowed through and adjacent wire. Marie Ampere also noted that a coil of wound wire behaved as a magnet with a current flowing through it.

1821 Faraday produced his first electric motor.

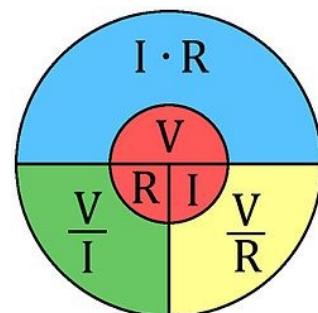
1826 George Simon Ohm noted that the current in a wire and the potential (voltage) across it was related to the resistance of the wire.

1827 Joseph Henry had conducted experiments that allowed him to use the knowledge to conceive the effect of Inductance in a coil. He also built one of the earliest motors.

1831 The principles of electromagnetism, Induction and generation were discovered by Michael Faraday.

1837 The first industrial motors were made.

1841 J.P.Joule's law of electrical heating were published.

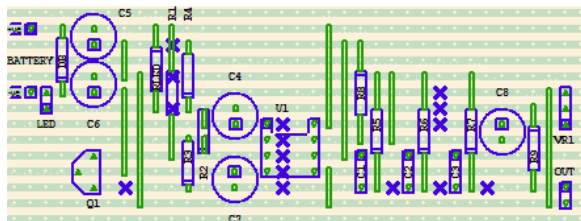




## Round The Web

### **VeeCad – Strip Board PCB Editor**

Anyone who done any home brew work will have made use of vero board. It's a great way to quickly solder together a few components with minimal pcb preparation. It does have the downside that there's very limited support in the various PCB CAD programs. VeeCAD Stripboard Editor looks to address that. It comes in a free and professional version. It's designed for windows, but runs happily in Wine under Linux. <http://veecad.com/index.html>



### **Cheapie Chinese Car Radios:**

The Chinese are starting to produce some very cheap dual band car radios. I'm surprised that it's taken so long, as I would have thought it wouldn't be hard to repack a hand held into a car radio format. The reviews I've read swing from ratings of zero to 5, with most of the better reviews pointing out that price has to be considered, and you can put up with a lot when it's cheap. Zastone MP300 and Leixen VV-898 are pictured here, but I know there's others. Would you buy one of these? Has anyone got one already? <http://www.eham.net/reviews/detail/11817>



### **Dick Smith at Manly-Warringah Radio Society**

The Manly-Warringah Radio Society had Dick Smith present to them in Nov 2014. The presentation was recorded and now published in the EEV Blog on YouTube.

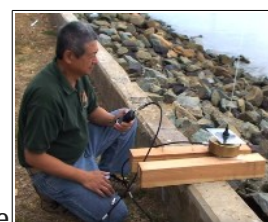
Dick Smith talks about how he got started, the early Dick Smith Electronics days, his round the world adventures in a helicopter, balloon, and plane, and how amateur radio played a huge part in his adventures and saved his life. He also touches on Dick Smith foods, and the loss of Australian manufacturers.



Well worth a look. <http://youtu.be/fK2KBDo7ISY>

### **Seawater Antenna**

Here's a youtube article about SPAWAR Systems Center Pacific who've developed a technology that uses the magnetic induction properties of sodium chloride (salt) in sea water to create UHF/VHF/HF antenna. It was published in 2009, so doesn't seem to have taken the world by storm as yet. If you take a look, take the time to read the comments.



[https://www.youtube.com/watch?v=9tIZUhu21sQ&feature=em-share\\_video\\_user](https://www.youtube.com/watch?v=9tIZUhu21sQ&feature=em-share_video_user)

## Club Activities – Satellite Weather

VK3BNC, Bob, presented on receiving weather data from various satellite sources at the last meeting in November. For anyone interested in having a go themselves Bob's provided some Internet resources which he found useful.

- Purchasing your NooElec RTL-2832 Dongle,
- [www.rtl-sdr.com/buy-rtl-sdr-dvb-t-dongles](http://www.rtl-sdr.com/buy-rtl-sdr-dvb-t-dongles)
- SDR # plus QPSK plus LRPT Google “IZ5RZR”
- Zadig. [www.rtl-sdr.com](http://www.rtl-sdr.com)
- Orbitron Tracking Program. Google.
- QFA Antennas. Google W3KH
- Turnstile Antennas. ARRL Handbook.
- Hobbyists Guide to the RTL-SDR, Carl Laufer.
- Frequency 137.100Mhz.



## REVIEW SILICON CHIP

V29. No.1 January 2016

- P1 Contents page.
- P2 Publisher Letter. The Quick Brake- its time has arrived.
- P6 Mailbag.
- P12 Blood Pulse Oximeters What how they work.
- P18 Monitor Temp,Pressure & Humidity with a Rasberry Pi & Sense Hat module.
- P26 Now run the Rasberry Pi free of a keyboard, mouse and monitor.
- P28 Build thisHigh performance valve stereo preamplifier.
- P36 High Visibility 6 Digit LED GPS clock. Part 2.
- P54 Quick Brake. Reduce risk of Rear endcollisions.
- P62 Circuits. USB powerinjector. Bidirectional Interface. Audio gen has square and triangle wave
- P66 The Service man swaps yarns of various faults he has found.
- P76 Versatile Technology. Electronics is not dead in this country.
- P82 Vintage radio. Looks at Sony's TR63 pocket transistor radio.
- P88 Ready Reckoner Reactance chart for easier calculations in RC, RL or LC networks.
- P91 Ask Silicon Chip
- P96 ADVERTISERS Index.



73 *Craig*

VK3KG



## A 'JEM' OF A POWER SUPPLY (with apologies to Les.)

A P.S.U. that works really well - and why.

from Reg VK3CAZ

This power supply will, if fitted with a suitable transformer, deliver 20 amps without distress, although if it is to be used for RTTY or packet operation it might be a good idea to mount a 'muffin fan' and shrouding arranged to pass cooling air over the pass transistors and, if possible, the rectifier.

Note that if you pay 'rubbish' prices for the pass transistors then that is exactly the quality of transistor that you will get ! So it is better to pay a little extra for good ones that don't require a vast amount of base current in order to pass the required amount of collector current.

Courtesy of Les VK3JEM the artwork for the PCB of the regulator and sensing section of the power supply is available if you need it, while the majority of the other components can be mounted on the heatsinks with the pass transistors.

A few notes on the values and construction. Referring to the circuit diagram of the unit, please note that for the best results the feed to the regulator board ( both positive and negative leads ) should be taken from the output terminals (literally). That means that the whole regulator is providing an output of 13.8 volts AT THE OUTPUT TERMINALS which is where we want it, not relying on some other reference point and so risking a voltage drop due to component and wiring losses outside the control loop. So feed the regulator board from the output terminals / socket. Likewise the 100pf and 1000pf ceramic bypass capacitors are also mounted right at the output point so as to keep RF out of the unit. Mount them there, not buried somewhere inside the unit or on the regulator board.

The wiring shown in heavy line is rated at 30 amperes minimum and ideally should be heavier. Remember that each voltage drop within the control loop is increasing the "headroom" required for proper operation of the regulator.

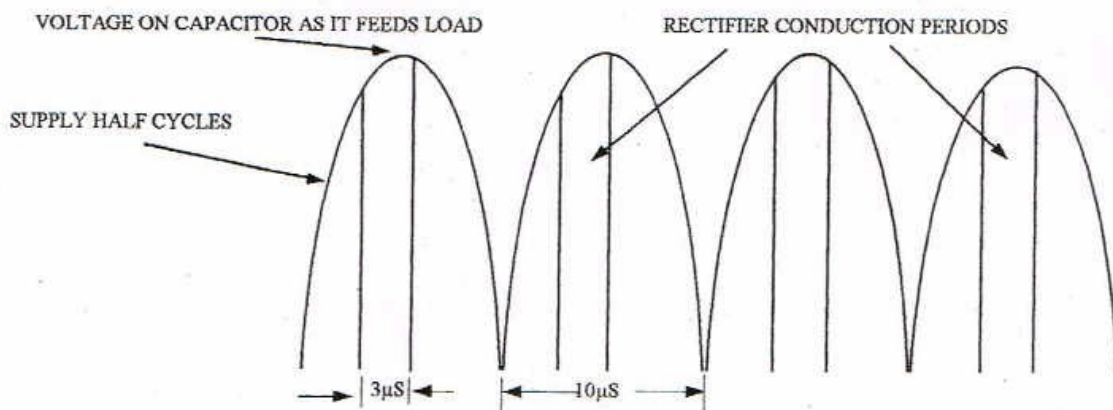
One temptation when building a power supply is to assume that the larger the value of the filter / reservoir capacitor, the better the results. This is far from being the fact ! It is quite easy to fit such a large capacitor that the rectifier is overloaded and so you risk destroying it, most of the power supply, and possibly even the rig connected to it !

Consider the charging and discharging of the filter capacitor as shown below, when the load is drawing 20 amps.

Only during the 3 mSec or so is the transformer / rectifier delivering current to the capacitor, but the load is drawing its 20 amps for the entire 10 mSec period of the waveform (at 50Hz.), so that during the 3 mSec period the supplied current is effectively  $10/3 \times 20 = 66$  amps. Hence the need for HEAVY wiring of the leads throughout the power supply, BUT ESPECIALLY that wiring from the transformer secondary through to the capacitor. Also remember that these values of current have to flow into (and out of) the capacitor itself. That means thick foils and wire within the capacitor, and explains why suitable units are so big physically.

Now let us suppose that we double the size of the filter capacitor to "improve" the smoothing. ( Please note that the Maths are a bit 'rubbery' but will be accurate enough for our purposes.) All we effectively do, in doubling the capacitor size, is to reduce the conduction period of the rectifier and so increase the peak current demanded. If we reduce the conduction period to 1.5 mSec (approx) by this doubling of capacitor size, then the current goes up to around about 130 amps. However the manufacturer does set out in his data sheets a value for the Max. Forward Current Peak (repetitive) ( $I_{FRM}$ ) of the diode / rectifier bridge and that value is one we may now be exceeding. Consequently we may be inviting the rectifier to breakdown and destroy itself if we keep on increasing the value of the filter capacitor.

Even worse than that is the fact that at "switch on", when the capacitor is fully discharged, the rectifier has to really work overtime to bring the capacitor up to its charged state. It may take several cycles of the supply to fully charge the capacitor, and again, remember that the diode manufacturer also specifies for his product the maximum current peaks ( non-repetitive) ( $I_{FSM}$ ) that can be handled, and also for how many cycles of the supply this can be permitted before the rectifier is liable to cry "quits" and go dead short circuit. Believe me a diode failing under load conditions like these ALWAYS goes dead short, so just imagine what some 25-30 volts (peak) of AC is going to do to your P.S.U. ( and your rig if it is turned on ) especially since the transformer can supply 20 amps ! Of course the better the quality of the transformer you have fitted the more likely the rectifier is to fail if the capacitor is too large, since a good transformer will provide very little limit to the secondary ➤





## A 'JEM' OF A POWER SUPPLY (cont'd)



current because its resistance is negligible and the only opposition to current flow is really the forward voltage drop of the rectifier and iron losses etc. in the transformer. So beware of adding an extra few thousand microfarads to that new "you beaut" power supply lest you destroy it completely.

There is a simple way of calculating a suitable value of filter capacitor which is really quite accurate despite some 'shortcut' and 'dodgy' arithmetic.

If the transformer maximum output voltage is known (and this can be measured) and the minimum 'headroom' voltage is also known and is added to the required output voltage, then that gives us a value for the available "sag" in the voltage of the filter capacitor between recharges.

It is a close enough approximation for our purposes to consider the discharge of the capacitor as linear and also forget the period of time, approximately 3 mSec, during which the supply is recharging the capacitor. Going back to basics, we know that the duration of the mains half-cycle is 10 mSec and during that time the supply must provide 20 amps (at full load).

Now 1 amp for 1 second is one Coulomb, so for 20 Amps and 10 mSec the quantity of energy is:

$$20A \times 0.01 \text{ Sec} = 0.2 \text{ Coulomb.}$$

That is the energy taken from the capacitor each half-cycle (approximately). Since the capacitor must not fall below the minimum 'headroom' value for the regulator, and it starts from the maximum value reached by the transformer - rectifier (with all its losses if known) we can calculate the minimum size of the capacitor that will meet our requirements. If we assume a good transformer, such as the excellent 20 Amp one made available by the M.D.R.C. at a very reasonable price, we can make a few calculations.

Using this transformer as an example, we find that, rectified and loaded down to 20 Amps output, we can get a voltage at the capacitor of  $+28v - 2v - 1.4v$ , with the 2v loss due to the regulation of the transformer and 1.4v due to the voltage drop across the rectifier bridge, leaving us with a maximum voltage of around 24.6 volts.

If we allow 4v of 'headroom' for the regulator (a value of between 3 or 4 volts is reasonable) then the minimum voltage on the capacitor must be approximately 18 volts (about 14 volts for the output and 4 volts for the 'headroom').

So in 10 mSec the voltage from the capacitor must not fall more than  $24.6 - 18$  volts, say 6.6 volts, if the regulator is to be still in control.

From our basic theory we know that in a capacitor  $Q=CV$  where  $Q$  = charge in Coulombs,  $C$  = capacity in Farads and  $V$  = voltage on plates, so if we re-arrange the formula we have  $C = Q/V$ , and substituting our values we get  $C = 0.2/6.6$  Farads or 30,000 microfarads. As long as the capacitor is of good quality and just exceeds 30,000 microfarads it will do the jobs adequately, and if we select a sufficiently rated rectifier we should not overstress it. Allowing for ageing, tolerances etc. a value of around 35,000 to 40,000 microfarads (in this case) will be quite

sufficient and is a good choice. Use a greater value than that and the possibility of running in trouble raises its head.

If the power supply maximum rating differs from this example this method can be used to calculate the value of the capacitor required. It tends to err on the 'safe side' so the calculated value will be quite large enough.

With the crowbar circuit the zener diode chosen is 15 volts since that is low enough to protect the rig, which is 13.8 volts  $\pm 10\%$ , but high enough not to suffer from spurious triggering in transients, costing fuses.

For peace of mind you might like to test the crowbar to see the exact trip point. To do this, wire two 12 volt globes in series and insert them in the lead from the anode of the SCR to the fuse, (you will need two globes because the filter capacitor voltage will be about 25 - 28 volts.) Disconnect the 10 ohm resistor from the positive output lead and connect it to the wiper of a potentiometer of about 10kohm. Connect the ends of the potentiometer track, one to the negative rail, and the other to the positive terminal of the filter capacitor. Turn the pot so that the wiper of this temporary potentiometer is down at the negative end of the track and turn the power supply on. Slowly, very slowly, wind the potentiometer up, with a voltmeter connected between the negative rail and the wiper, so you can monitor the voltage on the wiper. Slowly increase the voltage until the lamps light as the SCR triggers. Note the voltage reading - that is the crowbar trip voltage. If it is not right, either change the zener diode or if it is tripping at too low a value, then try putting a forward biased diode between the 10 ohm resistor and the zener diode. If you use 1N914 diodes each one will add about 0.6 volts to the voltage needed to trip the crowbar. Once the circuit has tripped you will have to turn the power supply off to reset it, so that will remind you to fit 270 ohm 5 watt discharge resistor across the filter capacitor. Don't forget to fit that resistor as it can make a mess of a screwdriver or meter prod if you short out 40,000 microfarads charged to 30 volts or so. Not only that but the fright you get will ensure that you remove your hand from the area very quickly and always via the screws/tags/burrs in the unit, so causing maximum damage to the skin on your hand. So fit it for safeties sake!

Don't forget to remove the temporary globes from the SCR anode circuit and also reconnect the input of the crowbar to the positive output rail of the power supply.

The 0.033 ohm 15 watt resistor used as a meter shunt is, in fact, three off 0.1 ohm 5 watt connected in parallel. Remember that this meter shunt must be connected within the control loop or the output voltage will vary with the load current.

The 275 volt varistor will take care of voltage spikes in the mains so they don't cause problems for the transformer.

Do not forget that at 20 Amp load output the bridge rectifier will be dissipating 28 watts so it gets rather warm and needs heat sinking, just as much as the pass transistors. Either bolt it down firmly to the metal case, or fit it to a heat sink.

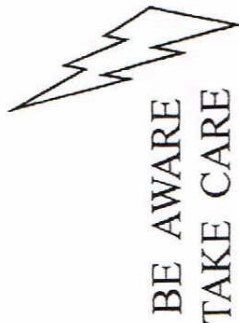
If the output voltage is too high then shunting the 68 ohm resistor in the common lead of the 7812 will reduce it. Putting 560 ohms in parallel with the 68 ohm gives 61 ohms and, in one unit, reduced the output to 13.6 volts.

ANY QUERIES ? Contact me and if I can help, I will. 73. >



# COMPONENT LIST

R1	270 ohm 5 Watt	C1	50,000 $\mu$ f (see text)
R2	3R3 5 Watt	C2	1 $\mu$ f Tant.
R3,R4,R5,R6.		C3	.33 $\mu$ f Cer.
	0.1 ohm 5 Watt	C4	10 $\mu$ f Tant.
R7	68 ohm 1 Watt	C5	.01 $\mu$ f Cer.
R8, R9, R10, R11.		C6	100 pf Cer.
	82 ohm 1 Watt	C7	100 pf Cer.
R12	560 ohm 1 Watt	C8	1000 pf Cer.
R13	1000 ohm 1 Watt		
R14	10 ohm 1 Watt	D1	35 Amp Bridge Rect.
R15	1000 ohm 1 Watt	D2	Red LED - Power On
R16	1000 ohm Lin Pot	D3	1N965 Zener Diode.
R17	.033 ohm 15 Watt	Q1, Q2, Q3, Q4	
	( 3 x 0.1 ohm 5Watt wired in parallel)		MJ2955 Pass T'sistors
	Fuses: 3 A (Slow Blow) 20A(Fast Blow)	SCR	C122E (8 A.)
	Varistor - V275LA20A	7812K	12V 3 Terminal Regulator
	0-1mA Meter		
	Heatsinks, fuse holders, switch, terminals.		Power Trans. (See Text)



February 2016

## December 2015 QST Review Special 100 years of QST. 1915-2015

- P4/5 Index.
- P9 Of Frogs and Canaries. QRM of the spectrum is a growing concern for all but amateurs are the first to notice its effects!..
- P13 Happy birthday QST also a progress report on the ARRL strategic program.
- P24 Letters we have Letters.
- P30 Orthogonal Loops – A medium Wavelength receiving system.
- P33 Antenna Gain Part 2. How do we get real Antenna Gain. ?
- P37 SPECIAL: From Dec 1915 Electro Magnetic Waves. By Clarence Tuska Assoc IRE.
- P39 REVIEW. MFJ-226 Graphical Antenna Impedance Analyzer.
- P43 REVIEW. VHF and UHF Preamplifiers and the DCW-2004B Sequencer.
- P45 REVIEW. DX Engineering Receiver Guards.
- P47 REVIEW. Down East Microwave 2 M Amplifier. [75W]
- P49 The Doctor. Short ckt in transceivers, earthing bus, and calling CQ Contesting.
- P51 Eclectic Tech, AllStarLink with a Raspberry Pi 2.
- P54 Hints & Kinks. Learn about keep cables neat, cutting PCBs, & Window line support.RJ45 mic extensions and remote troubleshooting using LEDs.
- P59 Amateur comms between Mars and Earth. When will the Elser-Mathes cup be awarded?
- P61 A Century of QST. From 1916 to today.
- P64 Happenings looks at Clarity on Amateur radio activities. Well worth reading should we ever have problems with tower restrictions. <http://youtu.be/AMY-5U1cJ6E>.
- P67 Getting started in Public Service.
- P90 How's DX? Getting ready for VP8. Now where is that?
- P92 6m openings to the Galapagos islands from USA.
- P96 Vintage Radio. The Conar Twins from the mid 1960's. Covers 80/40/15M.
- P102 QST index from December 1915, 1940, 1965 and 1990.
- P164/5 QST Index of Advertisers.

73 Craig VK3KG



- P4/5 Index.
- P9 Looks at the outcome of WRC- 15 and what the American amateur can expect to gain with the newly allocated 60M band. It will vary for the rest of the world. Interesting that it's the " first significant all new HF amateur allocation since 1979. And most significant since the removal of commercial broadcasters from 40Metres in 2003".
- P24 Letters we have Letters.
- P30 An all Mode 1KHz to 1.7GHz SDR Receiver. Fairly clear alternative.
- P34 DIY making a straight key with 3D modelling on a computer.
- 38 Command radio Set ARC-5. Using it on the ham bands.
- P42 Homebrew a twin paddle morse key for under a couple of dollars.
- P43 Desk microphone Power ON and PTT Indicator. An interesting project.
- P45 Antenna Gain. Part 3: How much Signal gets Received.
- P49 Done in One: Battery backup for your Wall Wart..
- P51 About SSB. Learn correct way to tune using SSB.
- P55 Review: Ameritron ALS-1306 HF and 6M Power Amp. (1200W, 160 to 6Metres)
- P58 Review: MFJ-939I Automatic Antenna Tuner.
- P60 Review: Rowetel SM1000 Free DV Adaptor
- P62 Review: JYE Tech Ltd have a DIY Oscilloscope Kit from China.
- P65 The Doctor. Splicing window lines, Do verticals need radials. Use a 20M dipole on 40M.
- P67 Microwavelengths. Feedback and how we use it.
- P69 Hands on Radio. Experiment 156 Designing a Broadcast Reject filter.
- P71 Eclectic Tech. Face to Face: Why its important Still.
- P72 Tech Correspondence. Keep accurate time for UTC – Synchronous Modes.
- P74 Hints & Kinks. Headset Adaptors, Boosting your energy & Reed switch Sensor .
- P76 You too can work 630 Meters.
- P80 More on WRC-15 and the 60M allocation in 5351.5 and 5366.5 MHz.
- P90 Hows DX. Palmyra Atoll. KH5. 11 to 26 January 2016.  
P5 North Korea Jan – Feb somewhere. P5/4L4FN
- P92 World above 50MHz. Geomagnetic Storm clouds has Silver linings.
- P96 Former Amateur spectrum up for sale in UK. (2.3 and 3.4GHz bands)
- P97 When Shortwave was the Gateway. Before Internet SW listening lured thousands to AR.
- P99 Exam Info. Understand how it works in the US.
- P150 ARRL Publications for sale.
- P156/7 QST Index of Advertisers.

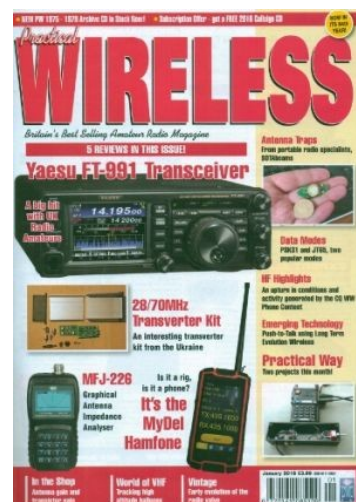
That's all for this month's QST.

73 *Craig* VK3KG



- P5 Contents page.
- P6 Keylines: .
- P7 News desk. New products and ideas.
- P10 Review: Yaesu FT-991 a big hit with UK amateurs. Has 5Mhz capability too.
- P14 Review: SOTA beams Antenna traps. Sotabeams.co.uk
- P18 Review: MFJ-226 Graphical Antenna Impedance Analyser. 1-230Mhz. Has a frequency resolution of 1Hz and can interface to a PC via USB connection.
- P21 Review: 28/70Mhz [4M band not in VK] transverter kit.
- P23 Doing by Design. Multiband Synthesiser Completion of the project.
- P28 History of the Trap Dipole. Memories of W3DZZ and the early 50's
- P32 Carry on the Practical way looks at Hands free for Handhelds. Use a USB for contest keying.
- P36 Use the MyDel Hamfone for 70cm as well as a phone.
- P42 In the Shop. Check Antenna gain and Transistor gain. What about measuring Distortion.
- P45 Emerging Technology: Looks at PTT with 4G LTE.
- P48 What Next? Make the most of your Station. Looks at Field day and portable sites. Differing Antennas and their characteristics.
- P52 Data Modes. Looking at PSK31 and JT65 <http://sourceforge.net/projects/jt65-hf> and <http://hamapps.hamspots.net> for programs.
- P56 World Radio Conference 2015. WRC15. Documents at the ITU website at itu.int
- P57 Letters coming in with various topics. Read about the history of Phonetic Alphabets.
- P58 World of VHF. High Altitude Balloon tracking, DMR and others.
- P62 Valve & Vintage. Partners in Wireless. Sir Ambrose Fleming, Senatore Guglielmo Marconi and Dr Lee DeForest.
- P65 HF Highlights A bumper Autumn in conditions.
- P70 Bargain Basement. A place to find out Market pricing of goods for sale.
- P71 Traders table.
- P72 Radio Book Store.

73 *Craig.* VK3KG





## **Aussie Bush Etiquette**

It's recognised throughout the civilised world, but we all need to be reminded from time to time.

### **In General:**

1. Never take an open stubby to a job interview...
2. Always identify people in your paddocks before shooting at them.
3. It's tacky to take an Esky to church.
4. If you have to vacuum the bed, it's time to change the sheets.
5. Even if you're certain you're included in the will, it's rude to take your ute and trailer to the funeral.



### **Eating Out:**

1. When decanting wine from the box, tilt the paper cup and pour slowly so as not to bruise the wine.
2. If drinking directly from the bottle, hold it with only one hand.

### **Entertaining at Home:**

1. A centrepiece for the table should never be anything prepared by a taxidermist.
2. Don't allow the dog to eat at the table, no matter how good his manners.

### **Personal Hygiene:**

1. While ears need to be cleaned regularly, this should be done in private, using one's OWN ute keys.
2. Even if you live alone, deodorant isn't a waste of money.
3. Extensive use of deodorant can only delay bathing by a few days.
4. Dirt and grease under the fingernails is a no-no; it alters the taste of finger foods and if you are a woman it can draw attention away from your jewellery.

### **Theatre/Cinema Etiquette:**

1. Crying babies should be taken to the lobby and picked up after the movie ends.
2. Refrain from yelling abuse at characters on the screen. Tests have proven they can't hear you.

### **Weddings:**

1. Livestock is a poor choice for a wedding gift.
2. For the groom, at least, rent a tux. A tracksuit with a cummerbund and a clean football jumper can create a tacky appearance.
3. Though uncomfortable, say "yes" to socks and shoes for the occasion.

### **Driving Etiquette:**

1. Dim your headlights for approaching vehicles, even if your gun's loaded and the roo's in your rifle sight.
2. When entering a roundabout, the vehicle with the largest roo bar doesn't always have the right of way.
3. Never tow another car using panty hose and duct tape.
4. When sending your wife down the road with a petrol can, it's impolite to ask her to bring back beer too.