GATEWAY

The Official Magazine of the Gippsland Gate Radio & Electronics Club Inc.

June 2022

Upgraded shack power & desk

Roof Top HF Verticals

Floppy Drive Resurection

And More

WIA Affiliated Club

14/06/2022

Cover photo, Buy, swap and sell night at the May general meeting.
(If you have any good photos, please send them in)

Contents.

Note: - club meeting minutes are now via a link in club emails sent out by the secretary.

Event Queue

June:

17th	8:00	General Meeting - FLEX RADIO Live stream presentation
18th	12:00	Mid-Year Lunch - La Porchetta Pakenham
25th	10:00	Squid Pole test and tune day

July:

1st	7:30	Prac Night
9 & 10th		IARU HF World Championship – courtesy WIA
15th	8:00	General Meeting
16th		WIA Trans-Tasman Low-Band Contest

August:

13 & 14th		Remembrance Day Contest – courtesy WIA

Club run events are only possible with the involvement of ALL members.
Without volunteers to coordinate and participate in club events the club will fail to prosper

GGREC President's Message

President's Message June 2022

Hi GGREC Members,

Now that winter is well and truly here, we may have more indoor time to spend using our amateur radios. HF propagation has been very good with many contacts being reported by our members.

The committee has been working hard behind the scenes organising future events that will be announced once the details have been finalised.

June GM Guest Speaker

Our Guest Speaker this month is Michael Walker VA2MW, Sales Manager for Flex Radio in Canada. As he will be speaking to us live on-line from Canada at around five in the morning, it would be great for him to see a hall full of members eager to hear and learn about Flex Radio. I think this is the first International Guest Speaker that we have ever invited to speak at our Club so please come along and join in.

Mid-Year Lunch this Saturday.

The Mid-Year Lunch which will be held at La Porchetta restaurant in Pakenham this Saturday the 18th of June at 12:00pm. Our last Mid-Year Lunch was a great success and I would like to see this year's lunch be even bigger and better. To book, email secretary@ggrec.org.au with your name and number of people attending.

Squid Pole Antenna Test and Tune day

On Saturday the 25th June at 10:00am we will be having a test and tune day for the Squid Pole Antennas. If the weather is kind to us we might fire up the BBQ for a sausage sizzle as well. A decision will be made on the day.

See you at the June General Meeting,

Bruno Tonizzo VK3BFT

President GGREC Inc.

From The Editor

This month I'm onto these scam artists

This particular one hops between several images that almost have no connection to their product.

One minute it's this pic of a mains filter out of a power supply, next it's a pic of someone blasting some aerosol into a power point.

At least it looks like an aussie one.

There are several others, including pinching pictures from a YouTube video of a man making a spot welder out of a microwave oven transformer, I wonder if he knows about this re-use.

None of the ads show a picture of the actual device on offer, it's actually just a mains capacitor in a plugpack style case, so yes, technically a capacitor will supress noise, however there is no way these will save you any money on your power bill.

The origins of this one come from large industry, where they are billed for the apparent power they use, rather than the actual power. So to save money they add capacitors etc. to correct their AC mains 'power factor' to make it equal to '1', so apparent power, 'VA' is equal to real power, measured in watts. I can see why the power companies would do this, as a poor power factor can cause excessive current to be drawn, putting a load on their equipment, so bill for it.

Now I have no idea if that is how it's done in Australia, however one thing is certain, it does not apply to residential customers, that's something the power companies have to bear. Also, if you do want to fix a poor power factor, you need test equipment etc., you don't just blindly add a cap or two. These will slightly change it, but to who knows what, definitely not '1', unity.

So some very ill informed person has said, "hey this saves industry money", it's a known technique, quick, make us a million of them, flog 'em on the internet and make us some money. Either that, or they are well informed, know this will be cheap to make, and they have this tale to spin to try and validate their position. – Not that they will ever be taken to task over it.

Unfortunately, in some parts of the world, doing this is all but a national sport. "If someone is silly enough to give them money, then it's their choice, not the suppliers". The seller is seen as doing good business as he's making a profit. "He's smart, customers dumb" or "dumb Aussies"

It could be said that scam artists that send you nothing for your money are doing you a favour as in you don't have to dispose of the junk otherwise supplied.

Caveat emptor, (Latin: "let the buyer beware")

Paul VK3TGX

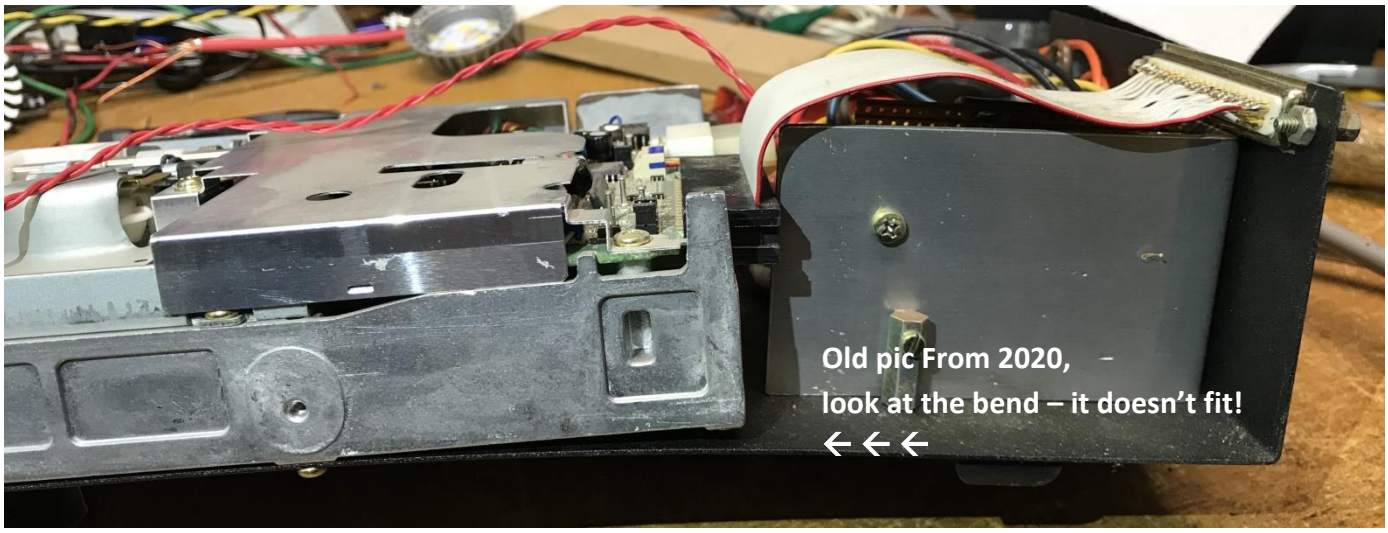
Computer Resurrection

Floppy Drives

In my ongoing battle with that old computer was the fact I only had one disc drive, so copying data to other disks was a tad painful. Continuously swapping disks in and out of that old full height Shugart disc drive was bound to bring me grief sooner or later.

Years ago, I acquired this external drive case. This thing has to be the cheapest and nastiest case I have ever come across, without a drive installed it's just two pieces of dis-jointed sheet metal, the disk drive holds everything together. It came with no power supply, so I built a linear one into the back, or rather shoehorned one in there.

The original drive is long gone (silly me), and since then has spent some time with a CD-ROM drive in there – back when CD's were relevant for listening to music. (i.e. a cheap CD player)



I'd later butchered in this beige drive, that proved to be a 'PC' style 1.2Meg high density drive. As you can see, it was a tad longer, so I had to cut a chunk out of the heatsink to get it in there.

Two problems, this drive is now both broken (it spins way too fast) and is not compatible with the old computer. 'Standard' 5¼ inch drives run at 300 rpm, whereas the original 8 inch drives ran at 360rpm. When 'they' brought out the high density 1.2 meg 5¼ inch drives, they took all the standards, including the rotational speed of the old 8 inch drives and just shoehorned it into the 5¼ inch format. Even the data rate changed, meaning I'd need to change the crystal on the controller board. I'm sure 8 inch drives were used 'back then' on the SWTPC 6800 computer I'm resurrecting. These days, 8 inch disc drives and disks are way too rare to be considered a practical proposition by me. If I lived in the USA, then I'd have a fighting chance – just look at all the YouTube video's on the subject. There seems to be so much of this stuff over there that as soon as one of the YouTubers needs something, someone finds one in their back shed.

Over here I just feel like the odd man out, I ask around and blank stares is all I receive.

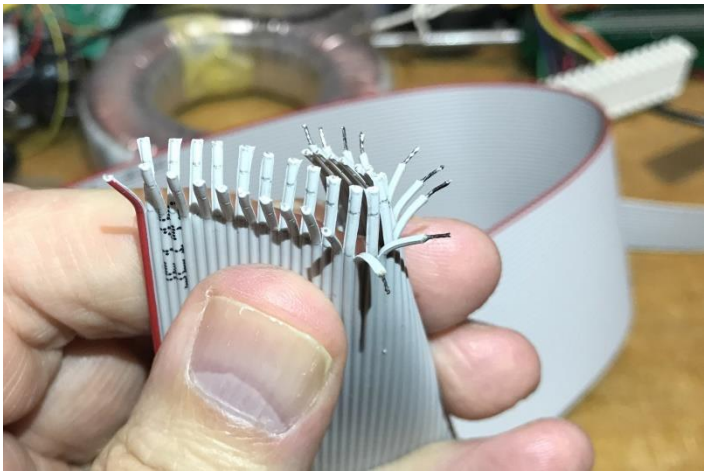
In my junk box I had a Teac 40 track disc drive, However all of its connectors are on the wrong side of the mechanism, meaning to get it connected up I had to have it sitting in that case upside down and off to one side.

This drive had also been 'cheapened' in that anything not relevant to an IBM PC had been left off (IBM kind of did their own thing), so I tossed this one aside.

Then I remembered I'd built a 'modern' MS-DOS machine a few years ago, complete with a nice Mitsubishi drive, that mechanically would be near identical to the original Mitsubishi 80 track drives I probably built this case for. (Back in my TRS-80 days) So I swapped that recalcitrant Teac drive into the MS-DOS box, and fitted the Mitsubishi into this case – phew life is now so much easier, everything just fits.

Back when I started computing with my TRS-80, I needed a nice connector to use on floppy drive cases etc. Internally drives used a 34way edge connector, fine inside a case, but awfully problematic outside and away from the actual drive. Back then I hit upon the idea of using a 37 way 'D' connector, readily available in both solder and crimp on ribbon cable style. I just pushed the 34 way ribbon cable over to the pin 1 end of the 37 way, leaving 3 spare pins at the other end. I suppose I could have run 5 and 12V out there to power a drive, but I just earthed them. Blow-me-down IBM then did almost exactly the same thing when they brought out their PC, the only difference being they used a female connector. This can also be found on very early laptops. A few models later and this external drive 'thing' had disappeared from the PC.

Anyway, I now needed a cable to connect the 37D on this case to the 37D on my SWTPC 6800, so onto the web. Ouch, 37D crimp-ons are now $20 each – by mail order, whereas solder ones are $5 at Jaycar…. Trolling the various Chinese mega sites etc. revealed nothing, I was forced back to Element 14, etc., and boy do they know how to charge.



So off to good old Jaycar and spend a few hours re-honing my soldering skills.

Once soldered on, then protected by a good fillet of hot-melt glue, I was good to go.

Note, if you do this, never unplug by yanking the ribbon, you'll soon kill it. A cut off 37 way back shell filled with hot-melt would be way more secure.

Paul VK3TGX

Installation and operations of a HF vertical antenna on the roof top

VK3IU Klaus

As my first step to get back on HF, I needed a suitable antenna, luckily for me some years back I purchased a Butternut HF6V vertical antenna, at the same time I also acquired a RigExpert AA30 antenna analyser, an invaluable device for tuning HF antennas.

Living in suburbia on a 512sqm block with a large building on it doesn't provide much options for the HAM, other than the roof, as the backyard is tiny. This needed to be carefully planned as in the near future some rotatable beam antenna will be installed for HF and later for UHF/VHF. That's only leaves the edge of the roof for the vertical antennas, far enough to allow a future turning radius of 4.5m for some HF beam.

The antenna is now mounted on top of the house about 6m above ground on top of our double story home.

Mast Installation

The mounting base for the antenna is a telecom grade 1.5 m mast mounted to the roof rafters as the main mounting point for the HF vertical, but I also installed a horizontal T-section for the installation of my UHF/VHF vertical antenna and the option for another antenna to be mounted in the future on the left of the HF antenna. The mast is mounted to the rafters, I had to drill through the roof tiles and the mast is supported by two 90 degree off set supports guides.

Picture above pre-erection stage

Photos to the left show the mast full installed with antennas and the pre erection stage.

The pinkish ropes are my anchor points wound around the rafters to provide me with a safe working on height environment. I prepared 3 anchor points on the roof and marked the tiles with orange dots to find them later. The older you become the more you need this safety feature.

Fully installed Butternut HF6v and UHV/VHF antenna

Warning:

Do not work at heights without adequate safety gear and training. I used to have a working on height training and certifications (commonly referred to as a riggers license).

The antenna had already its storm baptism in one of the recent autumn storms. I also guide it with some very high quality paracords (thanks “Pockets” for the suppliers info).

The antenna manufacturer specifies the un-guide antenna up to 128km/h wind speeds, so far luckily it hasn’t reach that yet. The wind on the picture to the right was appr. 60km/h as far as I recall from that day.

Two earth cables (20mm^2) 180 degree to each other (left and right side of the building) to two earth stakes, for lightning protection up to the mast, which hopefully provides a sufficient protection against voltage inductions due to lightning, maybe even some help for a direct hit, but then I probably need a new antenna.

HF6v during app 60km/h winds

Antenna tilt mechanism

Very early in the preparation to this project I realised that holding an 8m antenna at the lower 50cm is a bit of a challenge and doing this on the roof is probably not a good idea. Some kind of tilt mechanic would be a very good idea to mount the antenna while lying horizontally on the roof and then just push it up into its vertical position. This needed to be done multiple times during the tuning stage of the antenna. As I was a bit pressured for time, I didn’t wanted to wait for a commercial product which can be purchased from the US and is of high quality, I needed to construct one myself. So I looked through the garage and the stuff designated for the hard waste collection. I found a steel U-Shaped piece of metal which looked as very suited to my project.

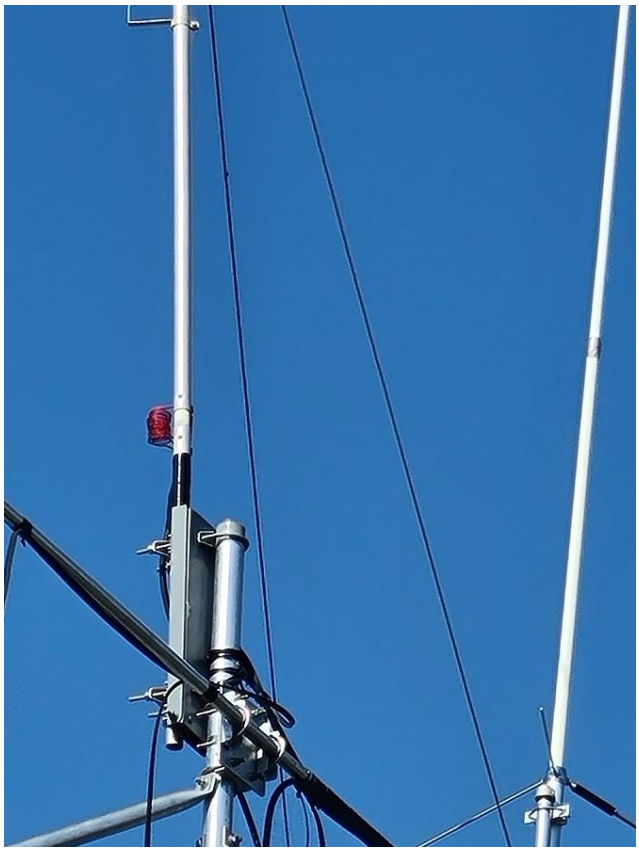
While it is steel, but it is of insufficient thickness to permanently hold the vertical antenna on its own. So as a compromise, I build it so that the erected antenna when vertical is mounted directly to the mast and only during the tilt process is supported by a mount on the tilt mechanism. This also provided a direct electrical connection between the mast and the antenna. The build hinges are strong enough to guide the antenna from lying lazy on the roof to its vertical operating position.

The mast clamps pass through the tilt mechanic slots and allows two additional brackets to hold the antenna when erected vertically.

I wish I had some mechanical workshop to make this look more appealing, all done with an angle grinder, file and saw.

When installed on the roof mast, I painted it in a thick layer of grey protection paint. The tilt has performed very well, especially during the antenna tuning process allowing me to tilt the antenna down, do my adjustments and tilt it up again until I was satisfied with the results.

Another other added feature, the antenna is now semi temporary as I can just climb up and tilt it down.

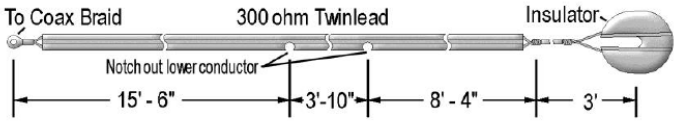


Butternut HF6V antenna

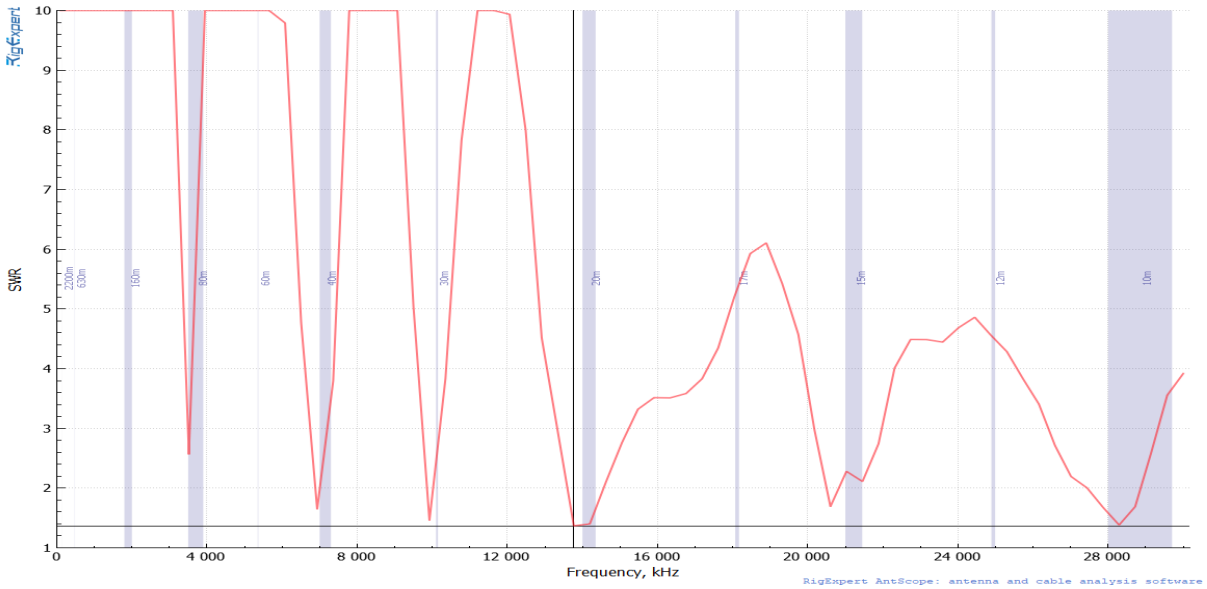
The tuning of this antenna is a bit challenging while the instruction are almost good for an US product. As with all multiband antennas you work your way through the tunning steps to discover that there is some feedback loop happening, as the first tuned band had moved. So all a bit tricky, that's why some of the best SWR are just below the band, I simply had enough after 2h baking on the roof top in the sun, a compromise. Maybe in the future I might try to pull the lower bands up again.

Interestingly while the antenna is built as a 6 band HF vertical (40m, 30m, 20m, 15m and 10m) I am also able to tune it to 12m and 17m which is beyond my expectations, it actually works well there.

Butternut developed a unique radial system for roof mounted antennas which is based on a 300Ohm twin lead antenna cable, cut at some pre-defined points. It all works surprisingly well, maybe due to the lack of a direct comparison.



Graph below show the SWR curve



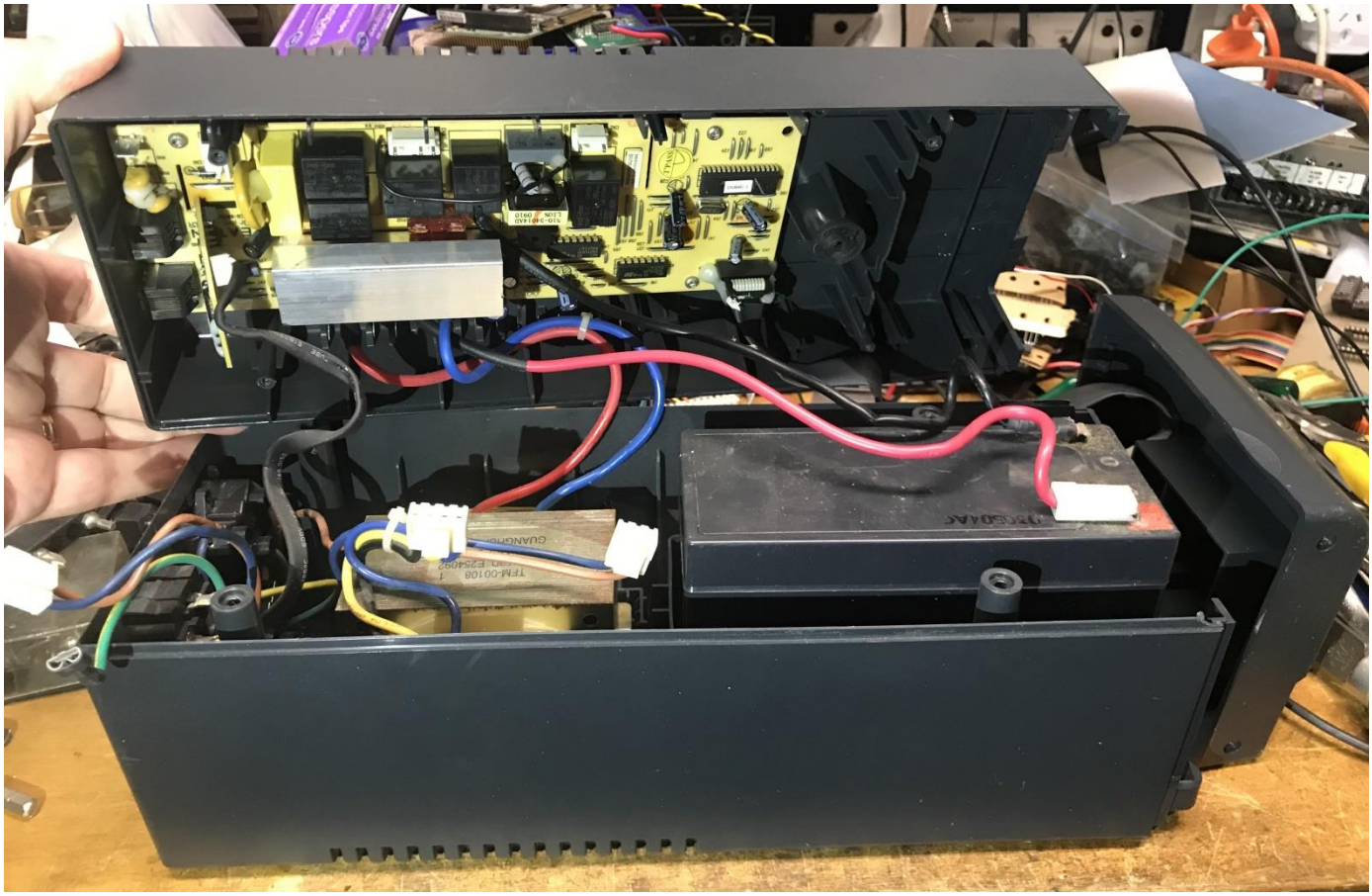
RigExpert latest maintenance measurement of Butternut HF6V

Since installation of the antenna I only had to re-tune it after the first storm. After which I needed to clean some contacts on the aluminium joints of the trap connections. The antenna had been stored for 7 years in the garage after a short use for 6 month in my old QTH, this caused some oxidation which needed to be removed. The heavy wind shake down nicely exposed this weakness.

Since then the antenna parameters have not moved, although it doesn't like heavy rain and the SWR can deteriorate during heavy rain.

Overall I am very happy with this antenna, I regularly compare it to the signals in the reverse beacon network of a fellow friendly HAM 5km away and I can't complain. As with all verticals QRM is an issue.

Playing with UPS`s



Having a UPS on your computer gear can come in real handy when the power goes off, it's not that I cannot survive without a daily computer fix, I can wait if there is no power (Although Bruno wonders when no magazine edits occur). However, losing it in the middle of doing something can be disastrous – especially if Windows is doing an update. Another aspect these days is the NBN, especially if you have phones connected, or a security system/cameras etc.

UPS's have saved me a few timers during shortish outages, although the really long ones are a challenge, especially the ones that take out mobile base stations when their batteries go flat. However that is a story for another day. (Or you're still living that in the Dandenong ranges)

UPS's come in two basic flavours, the true UPS, and the stand by power type. In a true uninterruptible power supply (UPS), the incoming mains is rectified into DC and used to both charge a battery and also run a 240V inverter. The inverter never stops, its run by either the battery of the incoming mains power, that's why they are called uninterruptable, as the inverter is always powered, there is no break to the power output to your load. In this configuration, the UPS's input power supply has to handle both the full load of the output and also charging of the batteries.

In a standby supply, the power supply is much smaller as it only has to charge the battery; also the inverter is normally powered down. The users load is connected to the incoming mains power via a relay. When the mains power fails, the inverter is immediately started and the load is then switched over. This does introduce a very short break in the power to your load, however most mains powered devices are not bothered by this, and a regular home user would never know the difference. The only thing you should notice (apart from the lights going out) is usually a slow beep from the UPS alerting you to the fact you're now on battery. Most UPS's will then switch to a rapid beep sequence when the batteries are getting low, finish/save what you are doing and do a proper shutdown NOW.

Note, in smaller retail stores, the salesman will probably not know, or even have herd of these differences, just take down the model numbers are do your research at home. By far the most common format is the standby type, the true UPS's are usually quite large and expensive.

If you only have a very small UPS, and you're in the middle of a Windows update etc., turn off any peripherals, like your video monitor, PC speakers etc., and hopefully the update will complete before the battery goes kaput. Small UPS's with a good battery can be all done in 10 minutes, the price you pay for not paying much for the UPS in the first place.

Now for the fun bit, playing with them.

If all you want is a working UPS, then you're probably better off ditching the broken one and just buying a new one, this is particularly so for a dead battery!

Now first we better get some safety stuff out of the way, UPS's tend to want to kill you, if you want your UPS to be safe, BOTH disconnect the incoming mains AND the battery. You can easily be poking around inside, with the mains power disconnected, and the UPS suddenly wakes up, no mains, so on goes the inverter, and bities then follow. (Been there, done that)

The same is almost true of the batteries, fitted with 20 plus amp fuses, there is a LOT of DC power in there that can easily blow the end off your probe/screwdriver, (and into your eyes) in large units with multiple batteries, a DC arc/fire is a distinct possibility. These can be incredibly hard to stop once started.

Also, in some UPS's, the battery is floating at mains potential, a non-isolated power supply and inverter are cheaper than an isolated type, so they save a few dollars, if your UPS has a large heavy iron core (as in 50Hz) transformer, then it's probably isolated. Better to be safe, test first. I.e. connect a 240v bulb between earth and battery negative, any illumination = Danger.

Of the non-iron core transformer based units I've come across, switchmode based units, both small and larger rack-mount, they use DC boost converters to raise the 12/24/48V DC battery up to 300 plus volts DC, this then feeds a H bridge (reverser of a bridge rectifier) to turn that 300 odd volts DC into an AC waveform. With one side of that output, the Neutral wire often tied to ground, that means the 300 volts DC, and probably also the battery, is bouncing up and down at 240V. If you wanted to earth the DC side, then the Neural wire would have to be live (swapping between +300v and 0v at 50Hz) not considered 'normal' so they tend to tie the neutral output to earth and float the DC side. (i.e. don't clip your scope lead to the battery neg)

I had a large 19 inch rack mount UPS, that also came with an optional 19 inch rack mount battery case (for extended run time), all running at 50VDC, this thing was HEAVY, as in a hernia special, However it was all live chassis. The external battery connecter was a double insulated custom job to allow for this live bit. This thing must have cost a fortune, yet they skipped adding any isolation at all. Needless to say it would have cost me a king's ransom for 12 new 12V batteries, (or even 4 for the base unit) so it hit the bin.

I also once had an Australian made true UPS, its output was quoted as having a less than 1% total harmonic distortion sine wave output. (Perfect for High End audio…) It was huge, containing 16 x 12V batteries, giving us a 200VDC battery buss. This was then stepped up to 400VDC, to feed a PWM switchmode output stage for the truly pure 240V sine wave, no matter what the street mains supply was doing.

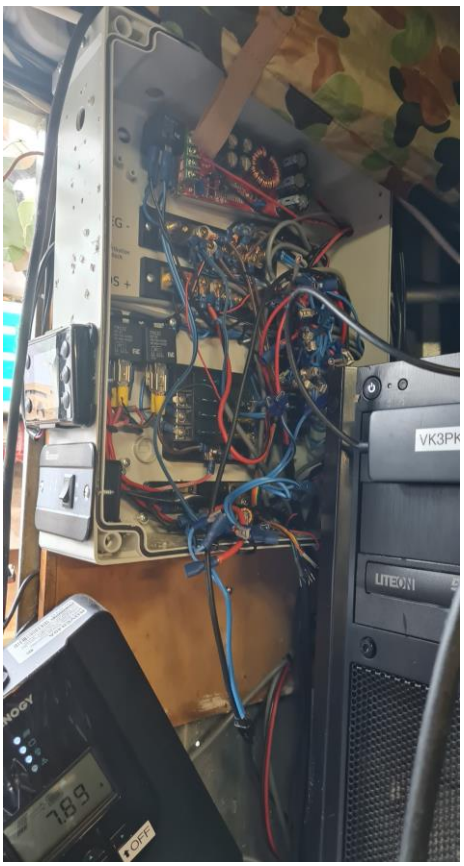
One bloke in Telstra slipped with a probe in one of these, starting a DC arc that ran along a longish DC buss circuit board, totally destroying everything in its path…..

Have fun….

Paul VK3TGX

Upgraded shack power system and desk

So after the mess of wires that had organically grown in my old 13.8 VDC system to the point that I was worried about shorts or wires coming out and gear turning off I decided it was time to rebuild it.



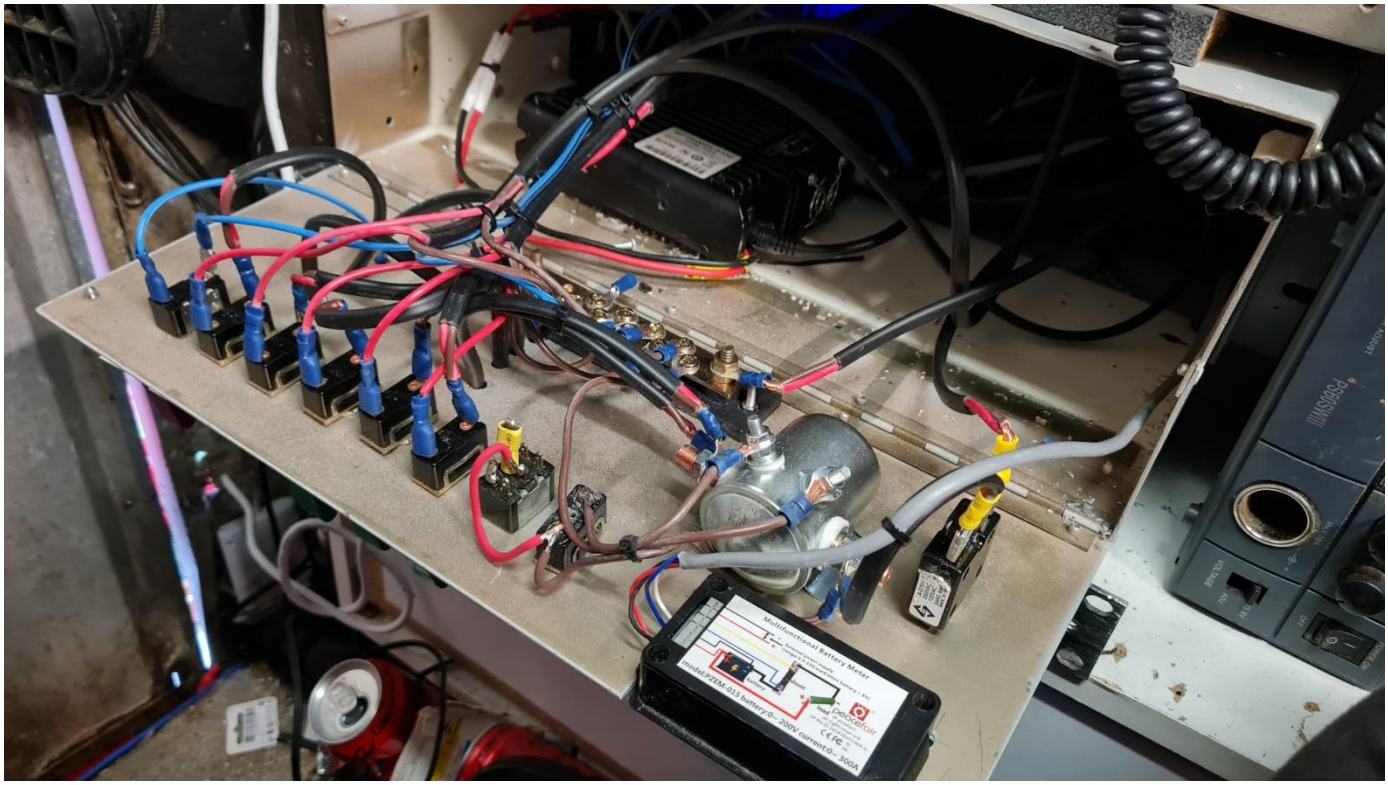
I started by looking for the input from the solar controller, the 200AH battery and the 45A PSU and cutting the cables for those so that the panel was now isolated.

This allowed me to start gutting out the old panel for all the parts I wanted to reuse in the new panel, this included the missile covers and toggle switches, fuse block, Power meter and bus bar.

I also had a 40A slow trip thermal breaker that I have had for a year and had never put in and a 200 amp contactor to allow me to isolate the battery and know I would have no reason to worry that my relay was too small for the job.

I had a small aluminium rack mount case that had a door on the back of it and was open on the front, so I spun it around to allow me to use the door as the front panel and it fitted just nicely under the desk. It also has thumb screws to get into the case easily so that was a bonus as well

So I worked out the layout and started drilling holes in the panel, there are 8 coloured coded missile switches, purple is accessories, blue is HF rigs, green is FM rigs, white is for some lighting I have yet to install and red is connected to the contactor to isolate the whole system.

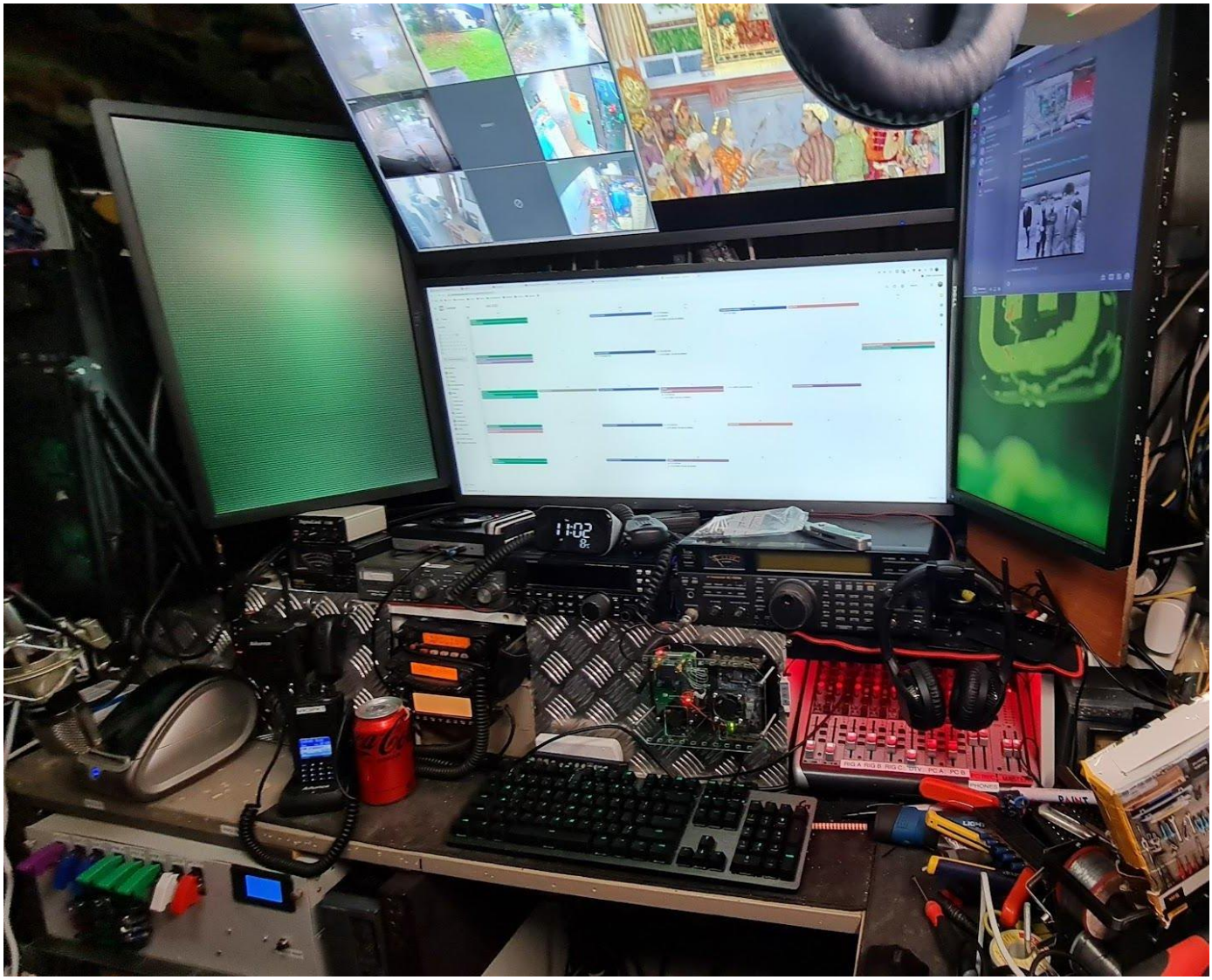


So all the wiring was completed and it looks a lot better than the previous panel, It follows this path. Input from the Solar/PSU/Battery comes in to the 40A slow trip breaker, this is if multiple radios are transmitting for longer periods at the same time, then the power runs to the contactor with a switch, and from there it runs to the fuse block that is rated at 100A throughput.

I have 40A fuses for the HF rigs and 30 A fuses for the rest of the devices. From the fuse block, the power now runs to the switches and then out to the device with Anderson connectors on the radios to make it easy to swap in a new rig if needed in the future.

To the right of the panel you can see my PSU, it is a switch mode one but it is designed for radio as it has a frequency shift knob to change the switching frequency of the PSU to move it if it is interfering with the band you are currently on.

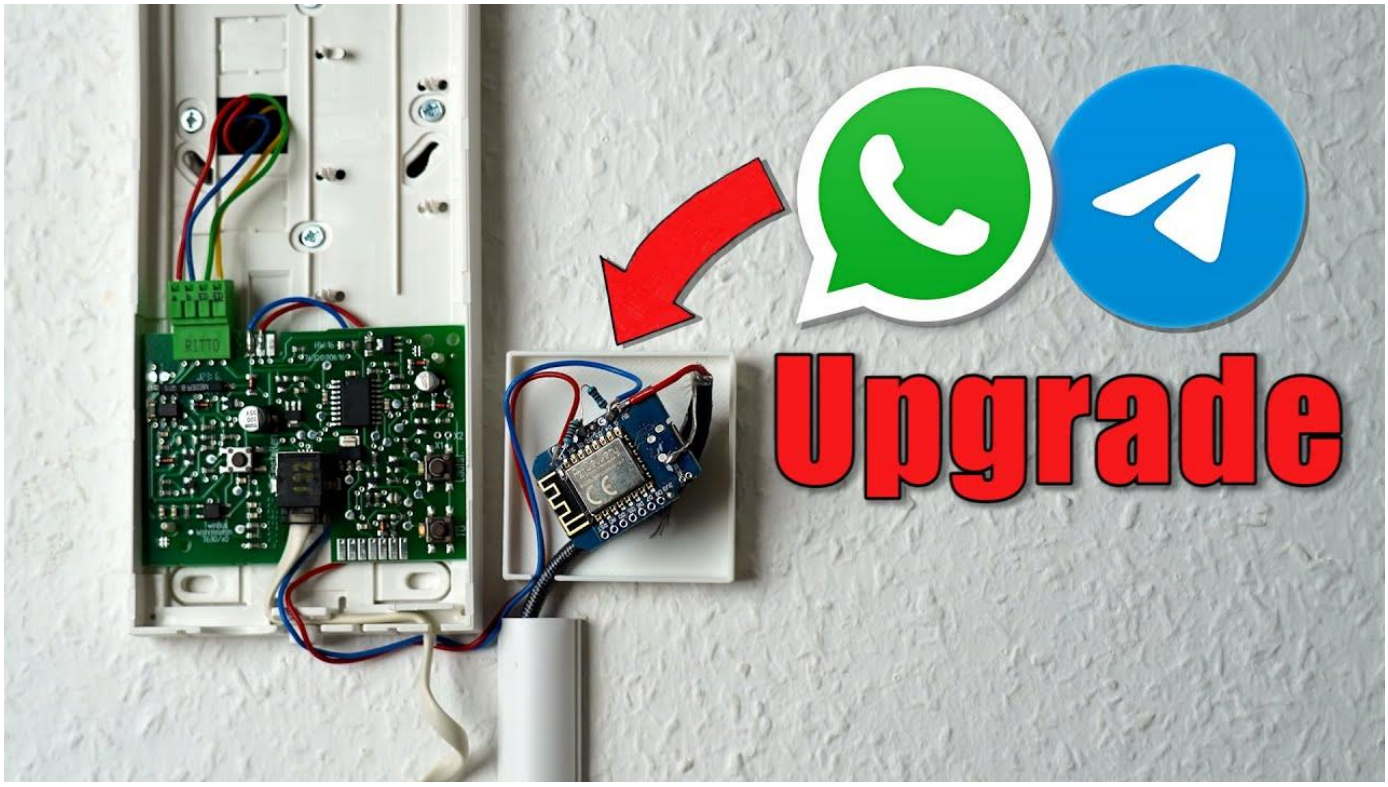
I still have to add a couple of USB ports for charging phones and a Cig socket to charge laptops from the solar, I have them I just have not put them in yet. As I was doing this I also took the time to move my HF radios and FM ones up to the desk, I dressed it with some aluminium chequer plate so I am happy with how it all came out after a week of work



Mark VK3PKT

Buy, swap and sell night

Interesting YouTube Videos



Every Apartment needs this Upgrade! (mobile notifications)
https://youtu.be/ZrkAWSemDC8

U2 Spy Plane | The Dragon Lady | Cockpit View At 70,000 Feet
https://youtu.be/N6c3Y_AtXco

Facebook Treats

‘Bert’ at the controls in his shack in 1950

WIRELESS INSTITUTE OF AUSTRALIA

WIA Affiliated Club

The GGREC is an affiliated club of the WIA

We also give Thanks to

Jaycar Electronics

ALTRONICS
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For their generous support over the years

Club Information

Meetings 20:00hrs on third Friday of the month at the
Cranbourne Guide hall, Grant Street Cranbourne
Prac/Natter nights first Friday in the Peter Pavey Clubrooms Cranbourne 19:30hrs
Visitors are always welcome.

Office bearers

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General 1	Yarn Onken	VK3NOV	Property Officer	'committee'	
General 2	Helmut Inhoven	VK3DHI	Assoc. Secretary	Miguel Vaca	VK3CPU

Call in Frequencies, Beacons and Repeaters

The Club Station VK3BJA operates from the Cranbourne Clubrooms.
6m Repeater Cranbourne VK3RDD, In 52.575 Out 53.575 CTCSS none
70cm Repeater Cranbourne VK3RGW, In 431.425MHz Out 438.425MHz CTCSS 91.5Hz
VK3RGW Repeater supports Remote Internet access (IRLP), Node 6794 **offline**.
70cm Repeater Seaview VK3RWD, In 431.575MHz Out 438.575MHz CTCSS 91.5Hz '**Testing**'
Simplex VHF - 145.450MHz FM, Simplex UHF - **TBA**
VK3RLP Beacons 1296.532MHz & 2403.532MHz **(currently offline)**

Membership Fee Schedule

Pensioner member rate $40.00, Extra family member $20.00
Standard member rate $50.00, Junior member rate $25.00
Fees can be paid by EFT to BSB 633000 - Account 146016746
• Always identify your EFT payments
• Membership fees are due by each April Annual General Meeting (AGM)

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