GATEWAY

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

June 2021

Experimental Repeater Link

KiCad and 2 projects

Azimuthal Map

And More

WIA Affiliated Club

Cover photo, Working Bee 17/06/2021, more on page 19.

Contents.

3 – President's message
4 – From the Editor
5 – KiCad and 2 projects
10 – Introduction: VK3IU Klaus illhardt
12 – Azimuthal Map
13 – Experimental Repeater Link
17 – Interesting YouTube Videos
18 – Natter Night 04/06/2021
19 – Working Bee 17/06/2021
22 – Club Information

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

Event Queue

June:

17th	Working Bee tomorrow at 10:00 AM
18th	General meeting, via video link, 8:00PM, see club email
26th	Mid Year Dinner (Lunch), La Porchetta Pakenham, 12:00 Noon, RSVP Bruno

July:

2nd	Prac/Natter night, via video link?, see club emails
10-11th	IARU HF World Championship – Courtesy WIA
16th	General meeting, via video link?, see club emails
17th	160 80 and 40M using SSB, CW and RTTY OR PSK – Courtesy WIA

August:

14-15th	RD or 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 May 2021

Well, I hope everyone managed to get through the 14 day Covid lockdown safe and virus free. I have had the Flu vaccination and my first Covid vaccination and can't wait for the second one in July.

Unfortunately, we will need to meet online this month to keep everyone safe and I will need to re-schedule our Guest speaker for another month when we can meet at the hall. The Covid restrictions have again impacted what we were able to organise for the Club but the Committee is working to get things going again as soon as restrictions permit. I know this is very frustrating for you and all our members but is something that we all have to deal with and do the best we can.

The Committee will be changing the format of our Monthly Club meetings to make them more entertaining an engaging for members. We are currently formulating a new agenda and I look forward to your feedback to let us know how if you like the changes.

I am looking forward to more members telling us about their projects, radio contacts and on-air activities.

Keep supporting your Club by paying your yearly subscriptions and we look forward to growing the Club together for the benefit of all GGREC members.

Kind regards,

Bruno Tonizzo VK3BFT

President GGREC Inc.

Gateway is the official journal of the Gippsland Gate radio & Electronics Club.
It is published in good faith for its members and other interested parties. The articles here in do not necessarily represent the views of the committee or the membership.
Any material that may be copyright has been included with permission where available.
If there is an issue with copyright please contact the editor

From The Editor

A very alarming storm

'The other day' we had quite a weather event, with quite a bit of flooding down the Gippsland way, with more to come.

Here things were not that bad, however I was kind of waiting for something to be blown off/away from my house. Wednesday is our bin night, which includes greenwaste, but with all this rain etc., I had to skip any real gardening, and just be happy with filling our bin with leaves from under my carport – which filled the bin well past half way.

After that the biggest challenge was keeping the bins upright for the garbos.

So I set my alarm clock for 6:00, so I could right my bins for the garbos, way too early for me, but having stinky bins for a week because they didn't get emptied was encouragement enough.

However we didn't get that far, for at 5:30am we were both blown out of bed by our burglar alarm. It hadn't been armed, but that didn't stop it. The control panel said 'power fail' & 'tamper' on three circuits. Tamper had me thinking something physical had happened to the sensors, siren, or wiring, so here I am scouring the house in my P.J.'s looking for storm damage. The only good bit was the rain was all but gone, so I didn't get drowned as I wandered around outside with a flashlight looking for damage. Luckily all I found was a destroyed bamboo roller blind, the house, shack, radio tower/antennas & carport looked ok.

So I came back in and wrote down the error codes so I could hopefully study the user manual later on for a possible cause. About the only thing I could think of was that we copped a power surge and the poor old alarm lost the plot and went berserk.

When I went back to the control panel, all the errors had gone – what?, so I quizzed the wife, oh she says, I cleared them …. Darn. But then two minutes later she says it's now saying 'power fail' again. But I've been here all along, no flickers in the lighting etc.

Then the penny dropped – have we just had a longish blackout while we were asleep, and the alarm's backup battery has failed?, so that when it came back on, the alarm system came on in alarm mode assuming someone was trying to defeat it by draining it's battery?? (tampering)

So after a few hours of sleep – or rather non-sleep, as I tried to recall the 'engineers code' so I could open the alarm panel to inspect the battery. When I finally got into the alarm panel, the writing was ~~on the wall~~ *on the battery* '31/01/2001' – and even then it was not new, so we were running on a 20+ year old battery.

I hooked up a multimeter and turned off the mains, the battery fell from 12V to 10V in about 1 minute – not good. We had a power fail a few days earlier – the alarm survived, that must have been the straw that broke the camel's back.

Luckily I had a recovered NBN battery out back (as Covid lockdown made getting a new one painful), so we are back – on borrowed time? *again.*

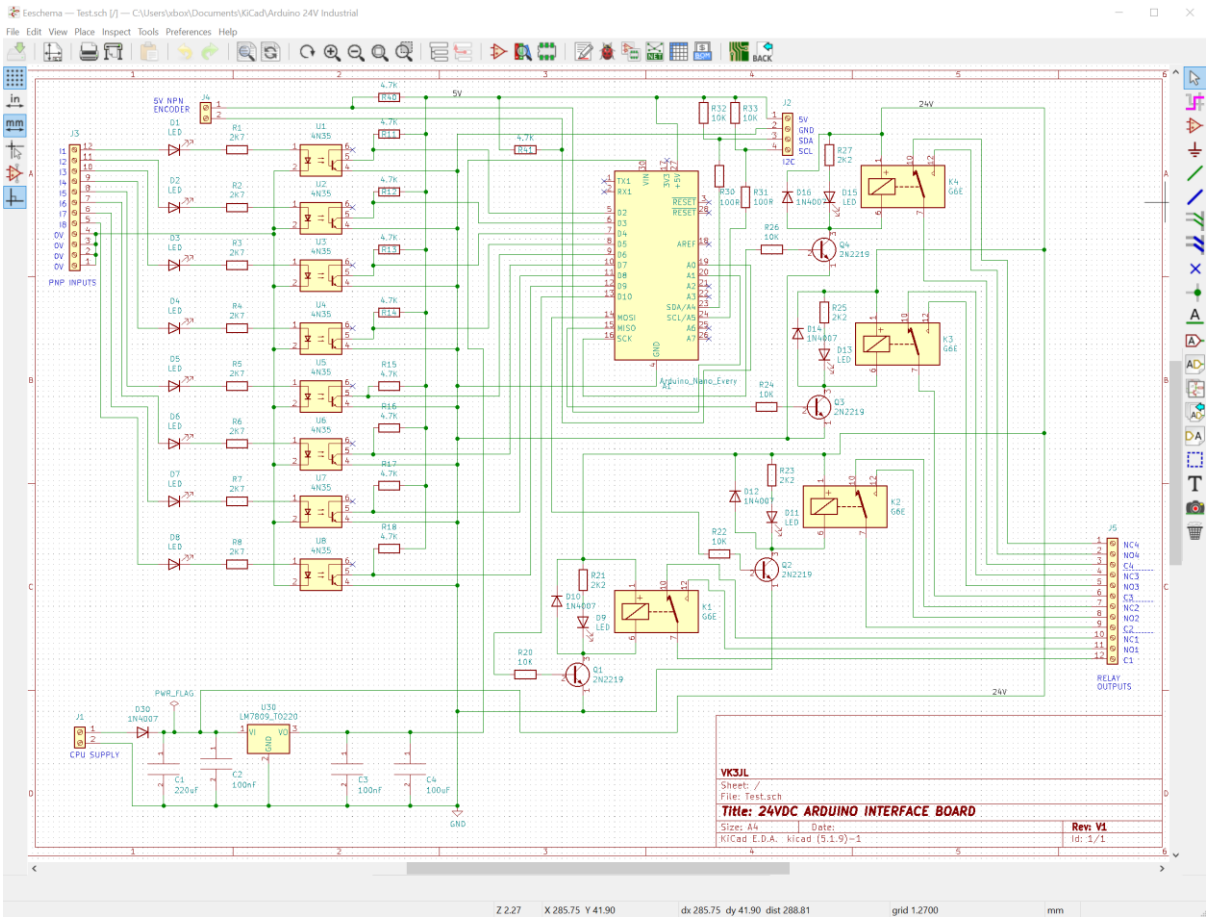
Paul VK3TGX

and 2 Projects

Following on from the GGREC Arduino sessions we had pre-Covid I have been playing with ideas for hardening them up for more useful 'industrial automation' tasks. Industry tends to favour 24VDC power sources and PNP orientated sensors (Positive Switching) for most of the modern equipment. I decided to experiment and built a generic test board for playing with sensors.

To design the system, I found the free open-source KiCad package and have now fallen in love with it! There are plenty of Youtube videos and support as well.

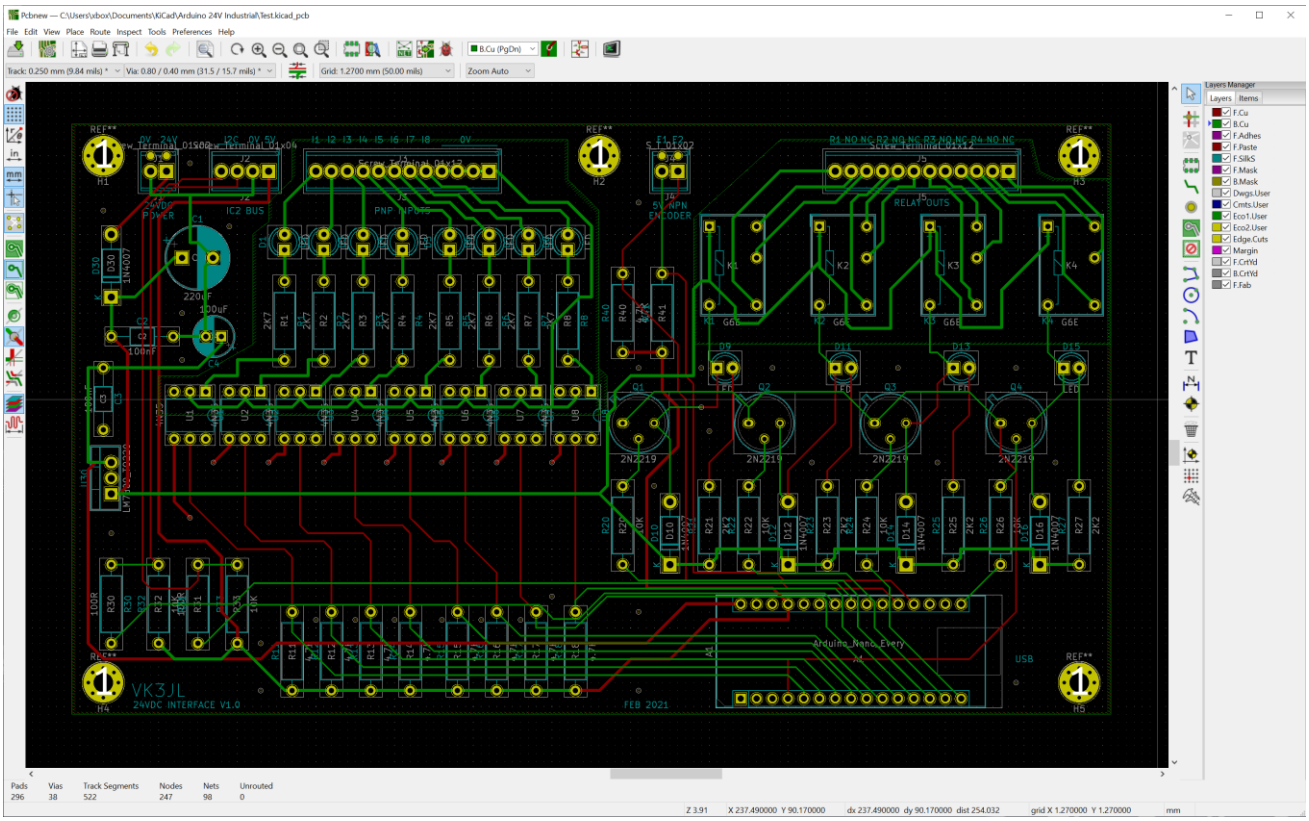
First I draw the schematic using the 'Eeschema' component and I found most of the parts I wanted to use were already in there making it quick to sketch. After laying it out it has some nice checks and validations to reduce design mistakes.



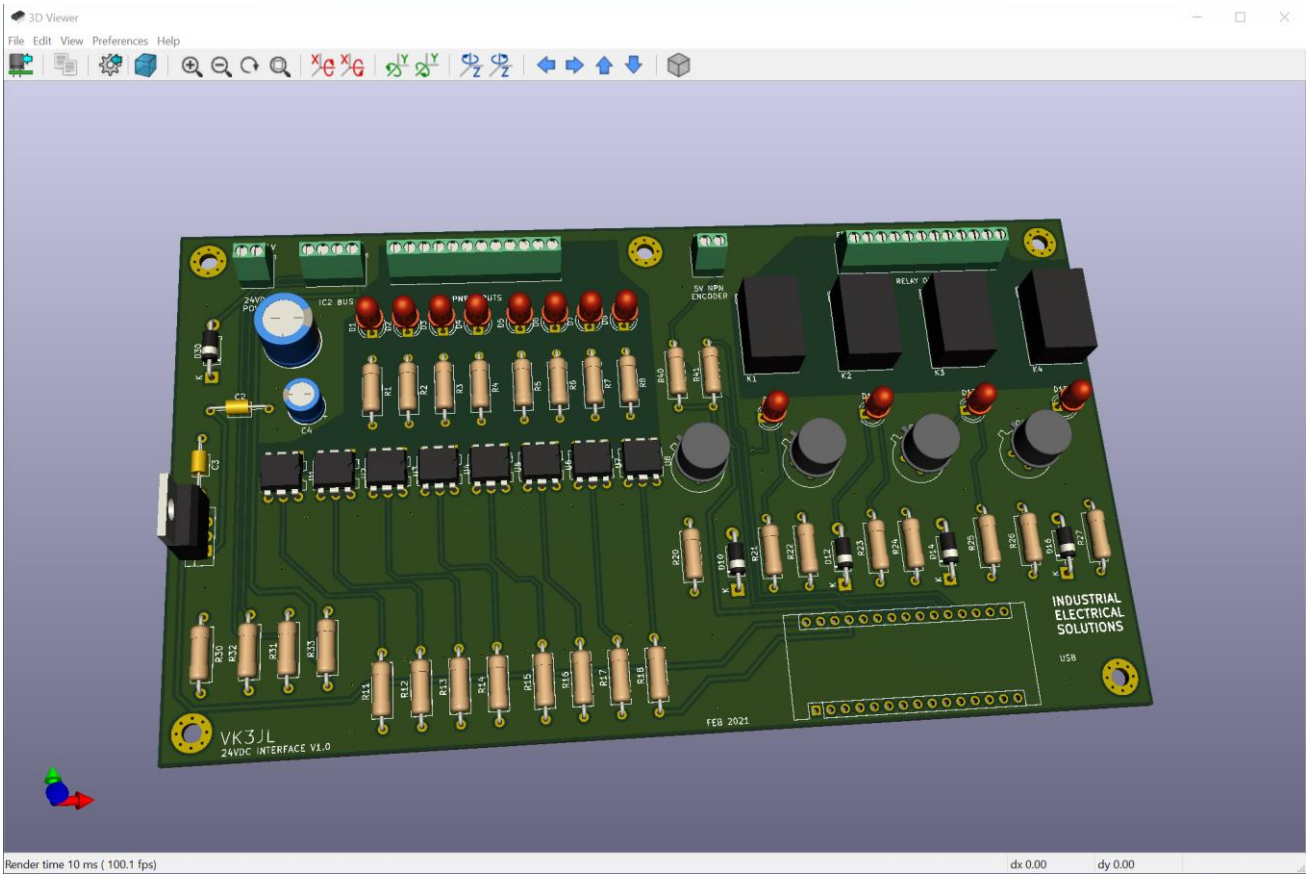
With the project I built I mimicked the I/O configuration of the Allen Bradley MicroLogix 810 PLC (which I use all the time) that has 8x 24VDC PNP Digital inputs and 4 relay outputs. I also added a 5V encoder and terminals for I2C expansion. I used an Arduino Nano as the base for the application.

After designing the system I had KiCad generate a dual sided PCB. After dragging all my components around to some sort of logical layout I then drew the track paths minimising crossovers and via usage. With the higher current paths I used 0.5mm width tracks whereas the default was and 0.25mm. I also tried to keep the higher voltage parts away from the 5V logic and zoned 'Keepout lines around this area' so it would not be flooded. I also added mounting holes and silkscreen printing as needed.

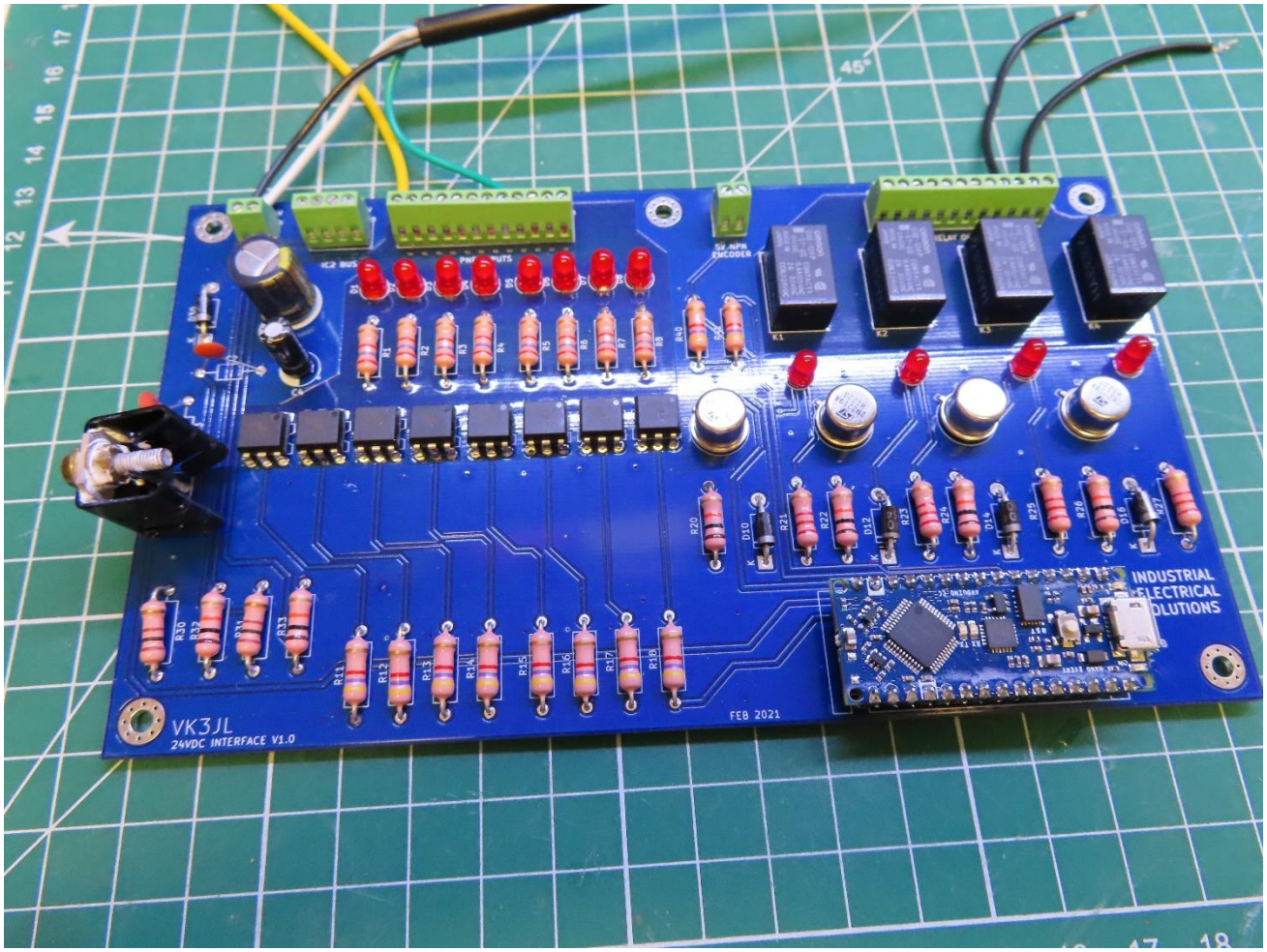
You may note I also made everything through hole design as that is my level of expertise (No surface mount components)!



Green is the bottom and red are the top tracks, the components are in aqua. A really useful feature is the 3D model where you verify check you layout.



Finally, I made this design into a gerber file and ordered 5 boards (minimum) from pcbway.



I reflection I made some rookie mistakes discovering after assembly I should have picked 3.5mm pitch terminal blocks (not 2.54mm), should have added better protection on the power input side and maybe look at a better voltage reg than the L7809 (Heat). That is all for Version 2 as well as a tighter form factor, change relays that can operate at 9V-30V coil voltage and add some PWM transistor outputs!

KiCad Project (2)

With the confidence in the design to production from the last design I immediately tackled the next one!

One of the series of machines I service has annoying issues with a control pendant that always seems to cause breakdowns. The Chinese manufacture supplies the button array on breadboard and with some crude soldering and link wire. The flexibility in the breadboard when buttons are pressed (as well as dropping swinging of the pendant) causes frequent dry joints and is a frankly a bugger and embarrassing to work on.

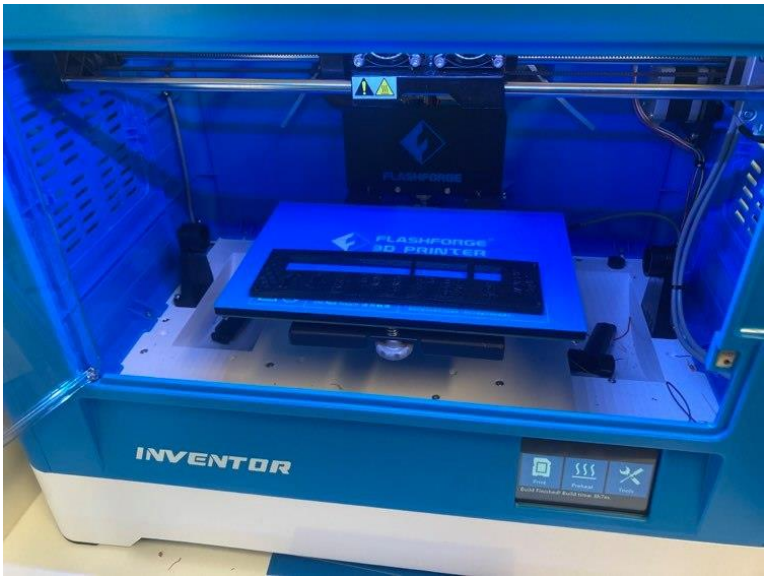
Here is the Original (Yuck)

I designed the new PCB to fit in the existing engraved face plate and milled base. I had to design the button footprint in KiCad as it is a little bit obscure (took ages to track down supplier and datasheet).

New PCB boards and buttons.

Pendant re-assembled with new PCB and existing faceplate and milled aluminium casing.

I also tried making a new 3D printed ABS faceplate. It does fit however I just need to find a way to 'flood' the label holes with white paint to keep it looking professional. I may end up getting engraved traffolyte but I will see how much demand there is. I have also printed the base in an aluminium infused 3D filament with only partial success (It clogged my print head)!



- Dave Rolfe VK3JL.

Introduction: VK3IU Klaus illhardt

1st and most important, pay up your membership fees!

I became licensed in 1980 with a foundation type of license (UHF/VHF) later on gaining the German B-License (comparative to the Advanced VK license) in 1981 and operated as DL5ZAH. I was very active as young HAM in my local German radio club, leading the youth group for many years, I am still a full financial member of the DARC, never left.

Professionally I am a trained TV Repair technician (don't ask me these days about TV repair etc.), later on decided that carrying of TV sets up multistorey buildings (big tube ones) is bad for my back and boring in the long run, so I thought of studying for an Engineering degree in telecommunications.

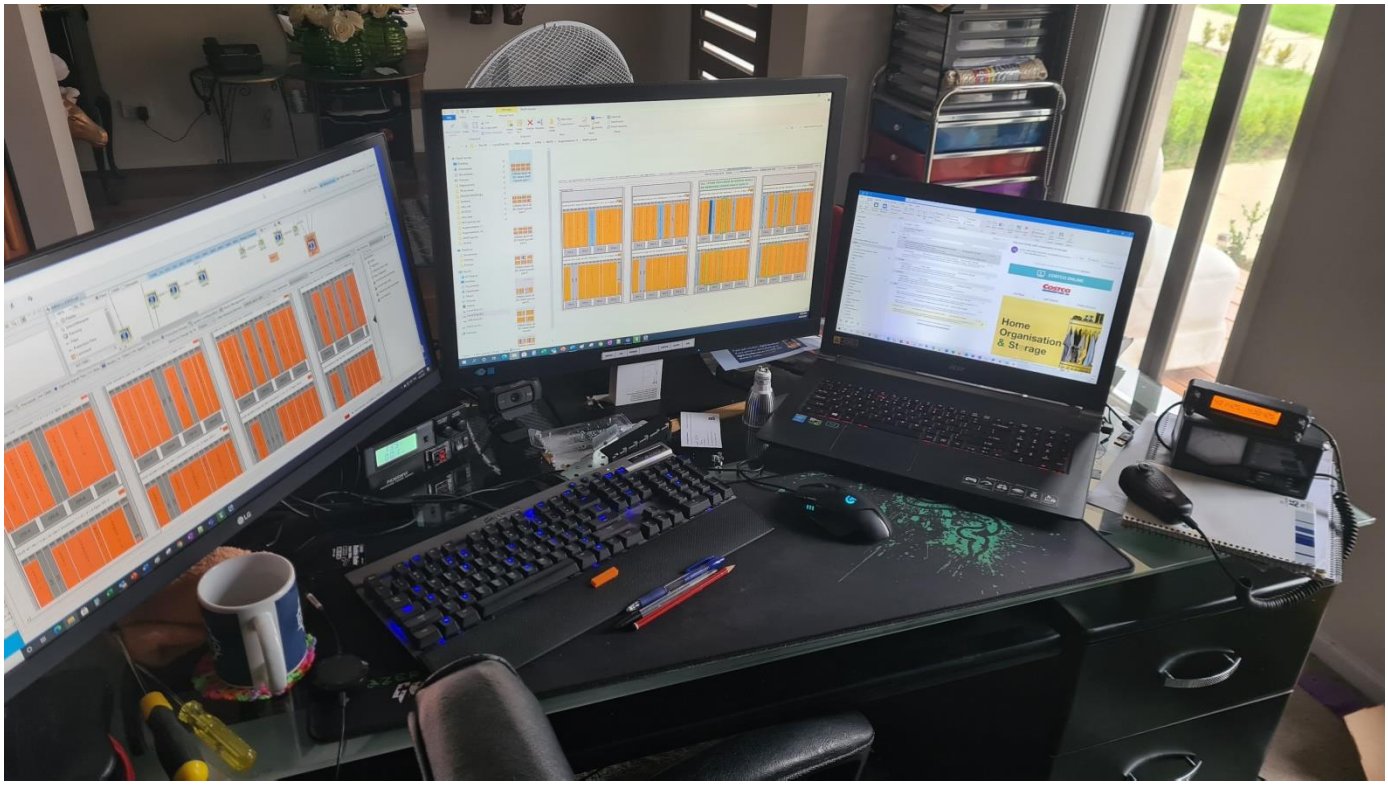
From 1993 to the end of 2000 I worked and lived in the Philippines as Telecommunications Engineer specialisation in Microwave Radio planning, design, build and operations working for SIEMENS. After the completion of many different projects in the Philippines, I moved to SIEMENS Australia as Senior Microwave Radio Engineer, where I designed what was then the Tasmanian Hydro Electric Microwave backbone. Today I specialised in optical network planning and design, DWDM and designed a big part of the NBN DWDM backhaul capacity, in layman's terms we design, deliver, build and support the superfast data highways of the NBN Internet. This work requires a quiet environment to concentrate on what you do, so working from home is very helpful. This is also the reason I am frequenting the morning Coffee group, as it fits nicely in a mental break time.

I love CW Operations and used to be very active during my time in the Philippines managing contest exchanges of 220Bpm (44 wpm) and standard QSO of 150Bpm (30 wpm), not sure if I come close to these now. Although I owned a MIC I hardly ever used it while working HF.

I also have a passion for HF QRP operations with my little Elecraft K2 and you can build up a pile up with 5 watt you just need to correct call sign if you in a rare DX country.

Getting a local call sign for the Philippines was a big "marketing" effort (social engineering) and I probably paved the way for other overseas hams. I had to work the local license body with the help of my Philippine Radio Club DX1RPI, befriended the Amateur Radio License officers and negotiated the condition to take the exam, these are still in place the last time I checked. Eventually I was given permission to take the local license exam, to be granted a local call sign, which I have happily done and passed. I was than issued the call 4F1RWW with which I made thousands of QSOs, so if you were serious about HF DX CW during this period of time, you probably worked me.

I am now holding the call VK3IU, the call was issued to me on September 26, 2008 after the two letter call sign raffle was conducted by WIA. My previous Australian call where was VK3WWR and for 3 month believe it or not I was on air as VK3RWW which had been issued to me by mistake :), I still laugh about this today.. During that time I had no idea that this was a repeater call, it was very similar to my 4F1RWW call.



My Working from Home setup, noticed the FT8900 to the right

Unfortunately for personal reasons I was not able to be very active in the past 20 years, but decided that 2021 is the year for return to the hobby.

So I joined GGREC and today I am running your financial affairs, Guys you really need to renew your membership and pay up.

If you like to know how my shack building project is progressing, tune in to the morning Coffee group I am happy to bore you to dead about the progress.

So hope to meet you soon

73 de Klaus

Azimuthal Map

I found this while planning my future setup, XYL would call it “day dreaming” after my garage project.

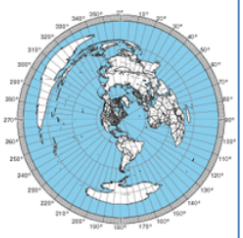
It is a Beam azimuth online calculator tool, which produces really nice beam heading azimuth maps. Input requirement would be the QTH locator .

Attached the HF azimuth headings for my particular QTH at **QF21QW.**

https://ns6t.net/azimuth/azimuth.html

Request an Azimuthal Map

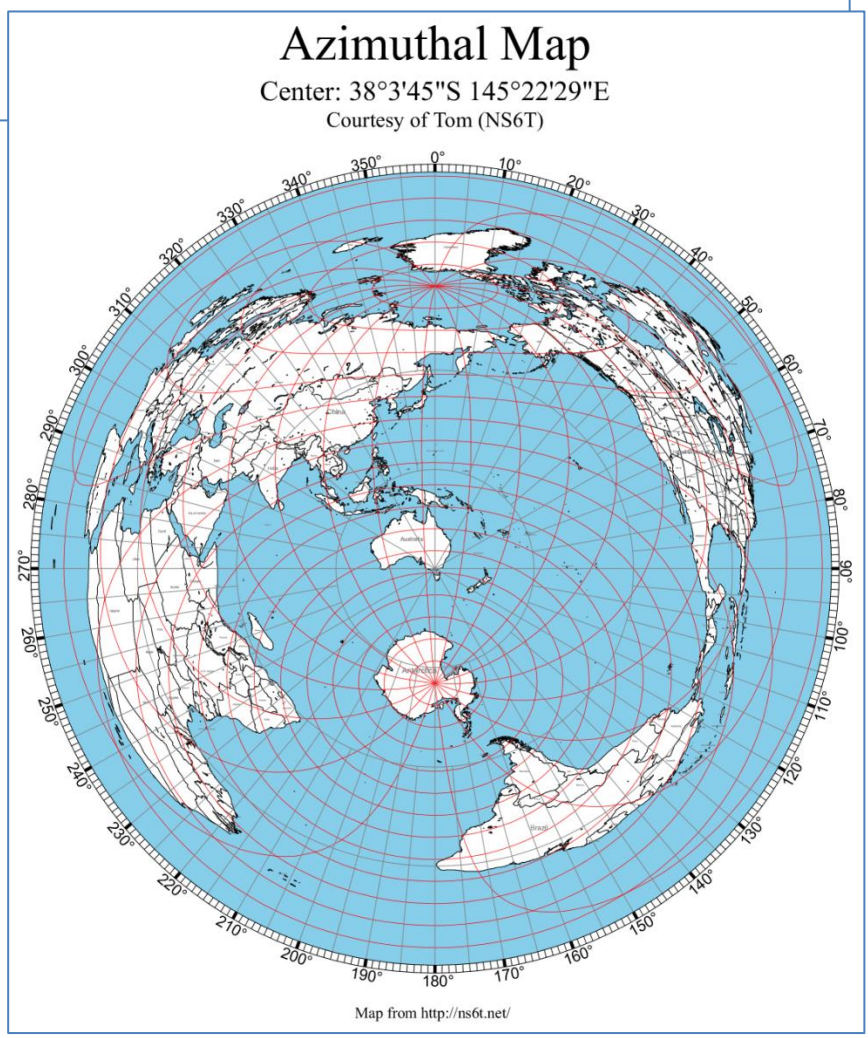
Title: Azimuthal Map
Location: (help) Label countries:
Distance: (help) Label NA states:
Paper: Letter (8.5" x 11") Label cities:
Black & white: Blue background:
Lat/long grid: View in browser:
Label grids:
Create Map | Estimate Location
Generating maps takes up to 30 seconds.



Use this form to create an azimuthal map for any location on the globe. You can customize the map in a variety of ways by changing the options in the web form. **Report problems or successes as comments on this page.**

The location can be a latitude, longitude, a Maidenhead grid square, or a city name (e.g., "51.504572,-0.268225", "IO91um", or "Chicago, IL"). You can indicate North and East coordinates by using a positive number or by adding "N" or "E" after the number. For South and West, you can indicate these with a negative number or by adding "S" or "W" after the number. A Maidenhead grid specification must have two upper case letters followed by two digits and then optionally two lower case letters. For big cities, you can enter just the city name. For other cities, enter the city and state for US cities and otherwise the city and country. The distance is in kilometers. More information on the program is available.

If you think this service is worthwhile and would like to show your appreciation, I encourage you to make a donation to the K6LRG repeater and contest operation (look for the donate bottom near the bottom of their site). You can also help by giving this site a high rating on eHam.net or dxzone.com. The names, locations, and populations of non-US cities were provided by The World Gazetteer. If you have suggestions for improvements or constructive feedback, please leave a comment on the blog.



VK3IU
Klaus Illhardt
former: DL5ZAH, DU1/DL5ZAH, 4F1RWW, 4F7RWW, VK3WWR

Member of:
DARC WIA GGREC

Experimental Repeater Link

Hi gents,
Here is some preliminary info about the experimental link

It is two TK805 radios joined via a breadboard controller.

One radio talks to the VK3RGW repeater via a 10 element beam @ 20W

The other radio transmits on **431.575 MHz** @30W and listens on **438.575** MHz. There are no access tones.

Its local antenna is just a co-linear vertical only 6M off the ground here at Drouin West, so it's not very high.

You can see the vertical here tied to a length of plastic pipe with duct tape (which survived last night's storm!)

Also you can see the 10 element beam on the short tower pointing at Cranbourne. This tower also receives my internet from 5km away and holds our TV antenna
(My main tower is tilted over at the moment as I'm putting on all new cables)

These are the reverse frequencies of the Mt Worth repeater not presently operating, (with a 7MHz split) as per its license.

I run reverse because it gives more RF separation between transmitter and receiver. No cavity filters are needed
I have not detected any measurable de-sensing of the local receiver. So far so good.

One radio had an intermittent PA module. I found a replacement module that was pretty close in my junk box and put it in last night. It seems to be producing a stable 20W. I use that to hit the Cranbourne repeater.

I folded up some scrap colourbond sheet to make a box for the unit.

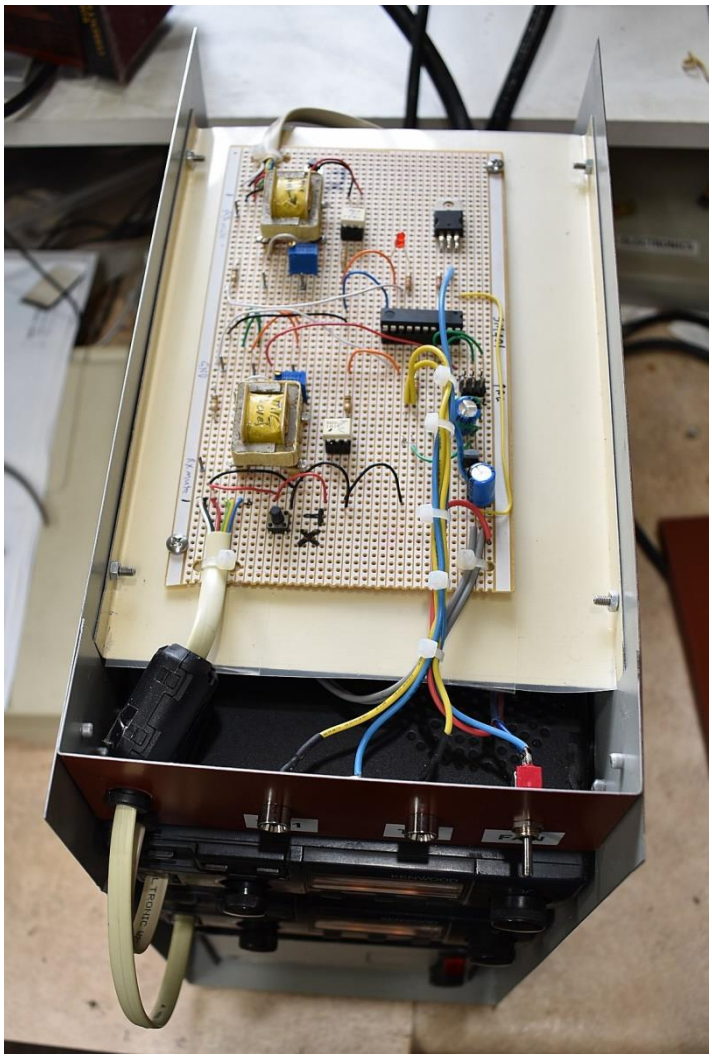
Because of the duty cycle I added a PC fan between the radio heatsinks, operated via MOSFET. It runs under software control when either radio is transmitting, plus an extra 20 seconds to reduce stop/starts all the time when talk-through action is happening.

In the top you can see a simple interface. A couple of audio isolation transformers and level control between the low-level audio out of one radio, into the mic input of the other radio.

The PTT lines are coupled via optocouplers, so there is full isolation between radios, apart from the 12V supply.

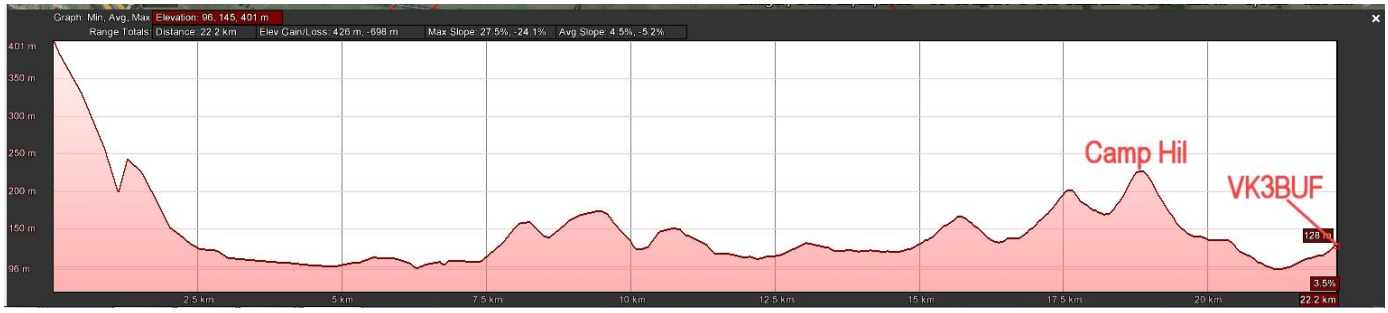
An Atmel ATtiny2313 micro is managing the PTT circuit, so I have software control over transmitter coupling too.

It is still just experimental and reliability is unproven. So I will run it for a little while and see what happens, while we figure out what's happening at Mt Worth. If its still working after a few weeks, it would be worthwhile plugging it in at Mt Worth for greater range and see what that does. As its self-contained, it won't disturb other gear on-site.



Here is an elevation profile from the top of Mt Worth (Left) to Cranbourne.

This is an elevation profile between my place and Mt Worth. You can see that I have one hill in the way, but I still mostly receive it ok.



Here's an elevation profile from Mt Worth to Mark's (3PKT) place in the heart of Drouin. It has unobstructed views of Mt Worth.

Let's see how it goes first. At least we are exercising the frequencies we are paying for with the license.

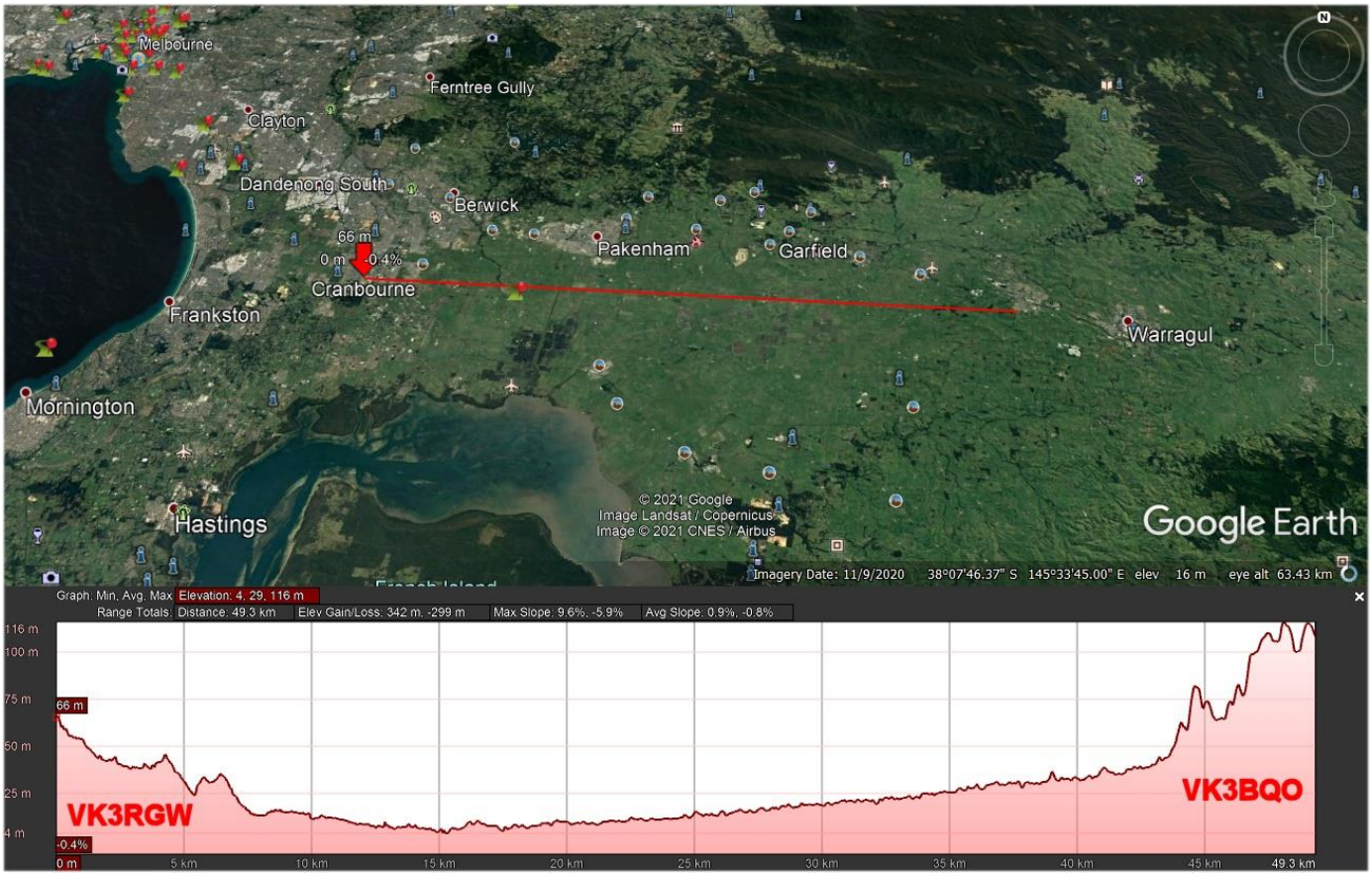
Ian VK3BUF

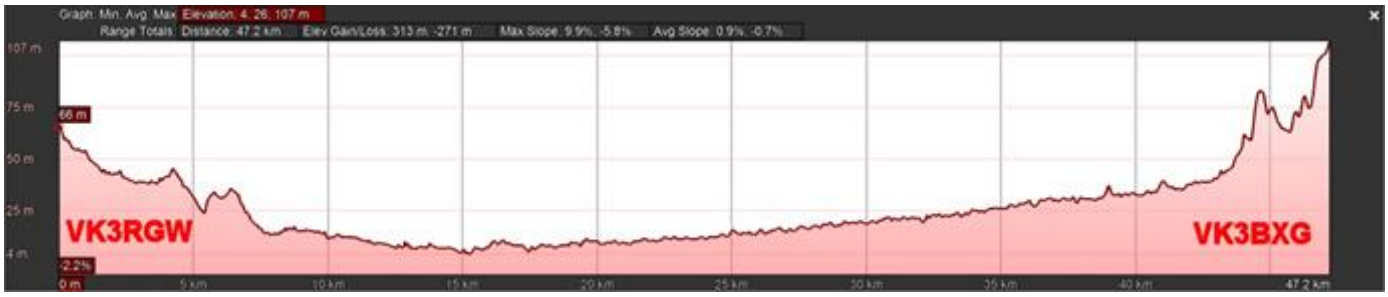
Generating Elevation Plots

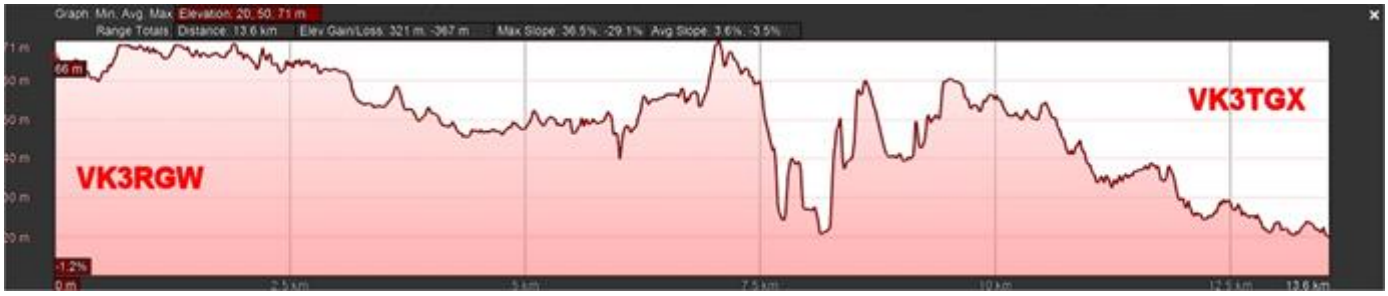
The Elevation Profile feature of Google Earth is a bit convoluted.

First use the ruler to draw a line between two points, but then you must 'save' that line.

On the left side of the screen, locate the saved link to that line, right-click on it and near the bottom of the list you will see 'Elevation Profile. Click on that. it is a handy tool for Amateurs.

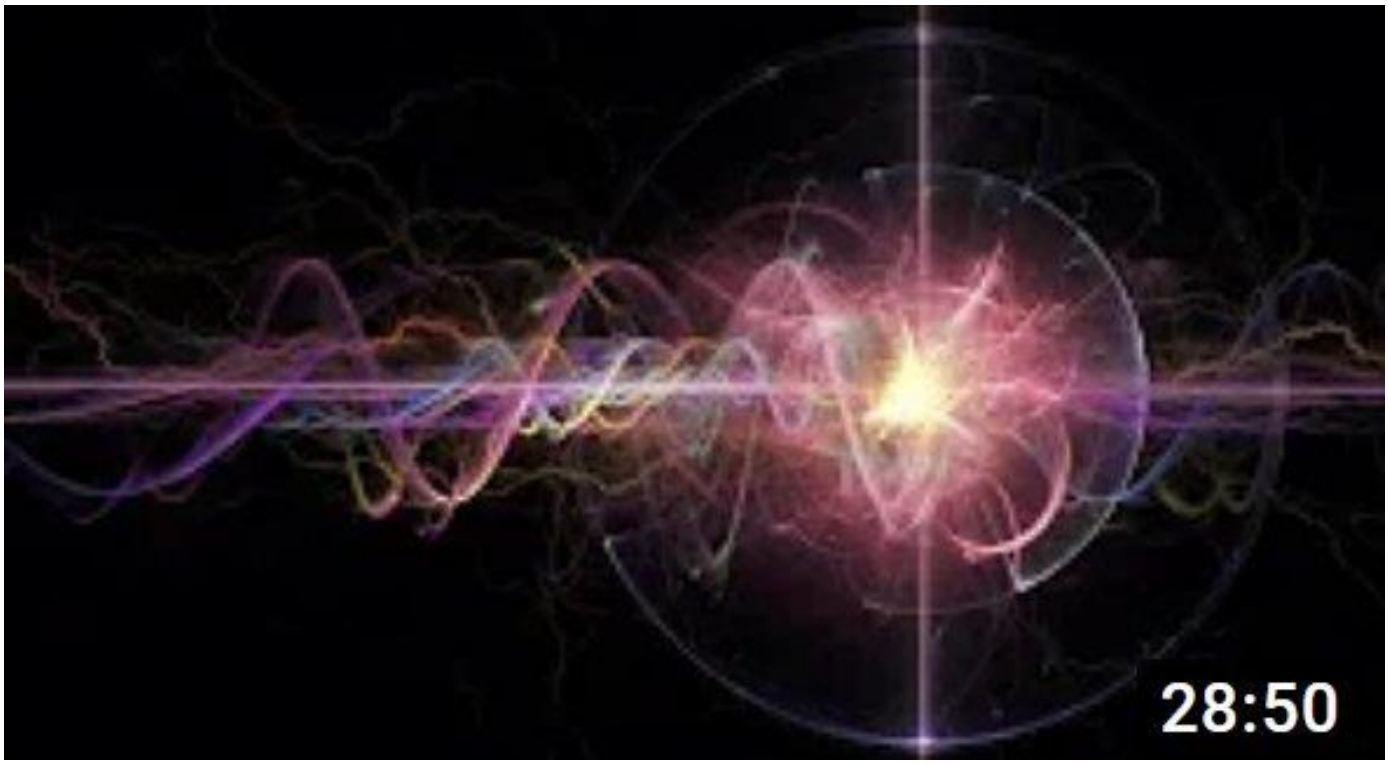

Melbourne
Ferntree Gully
Clayton
Dandenong South
Berwick
66 m
0 m -0.4%
Pakenham
Garfield
Cranbourne
Frankston
Warragul
Mornington
Hastings
© 2021 Google
Image Landsat / Copernicus
Image © 2021 CNES / Airbus
Google Earth
Imagery Date: 11/9/2020 38°07'46.37" S 145°33'45.00" E elev 16 m eye alt 63.43 km
Graph: Min, Avg, Max Elevation: 4, 29, 116 m
Range Totals: Distance: 49.3 km Elev Gain/Loss: 342 m, -299 m Max Slope: 9.6%, -5.9% Avg Slope: 0.9%, -0.8%
116 m
100 m
75 m
66 m
50 m
25 m
4 m
VK3RGW
VK3BQO
-0.4%
0 m
5 km
10 km
15 km
20 km
25 km
30 km
35 km
40 km
45 km
49.3 km


Graph: Min, Avg, Max Elevation: 4, 26, 107 m
Range Totals: Distance: 47.2 km Elev Gain/Loss: 313 m, -271 m Max Slope: 9.9%, -5.8% Avg Slope: 0.9%, -0.7%
107 m
75 m
66 m
50 m
25 m
4 m
VK3RGW
VK3BXG
-2.2%
0 m
47.2 km


Graph: Min, Avg, Max Elevation: 20, 50, 71 m
Range Totals: Distance: 13.6 km Elev Gain/Loss: 321 m, -367 m Max Slope: 36.5%, -29.1% Avg Slope: 3.6%, -3.5%
66 m
VK3RGW
VK3TGX
-1.2%
0 m
13.6 km

Ian VK3BUF

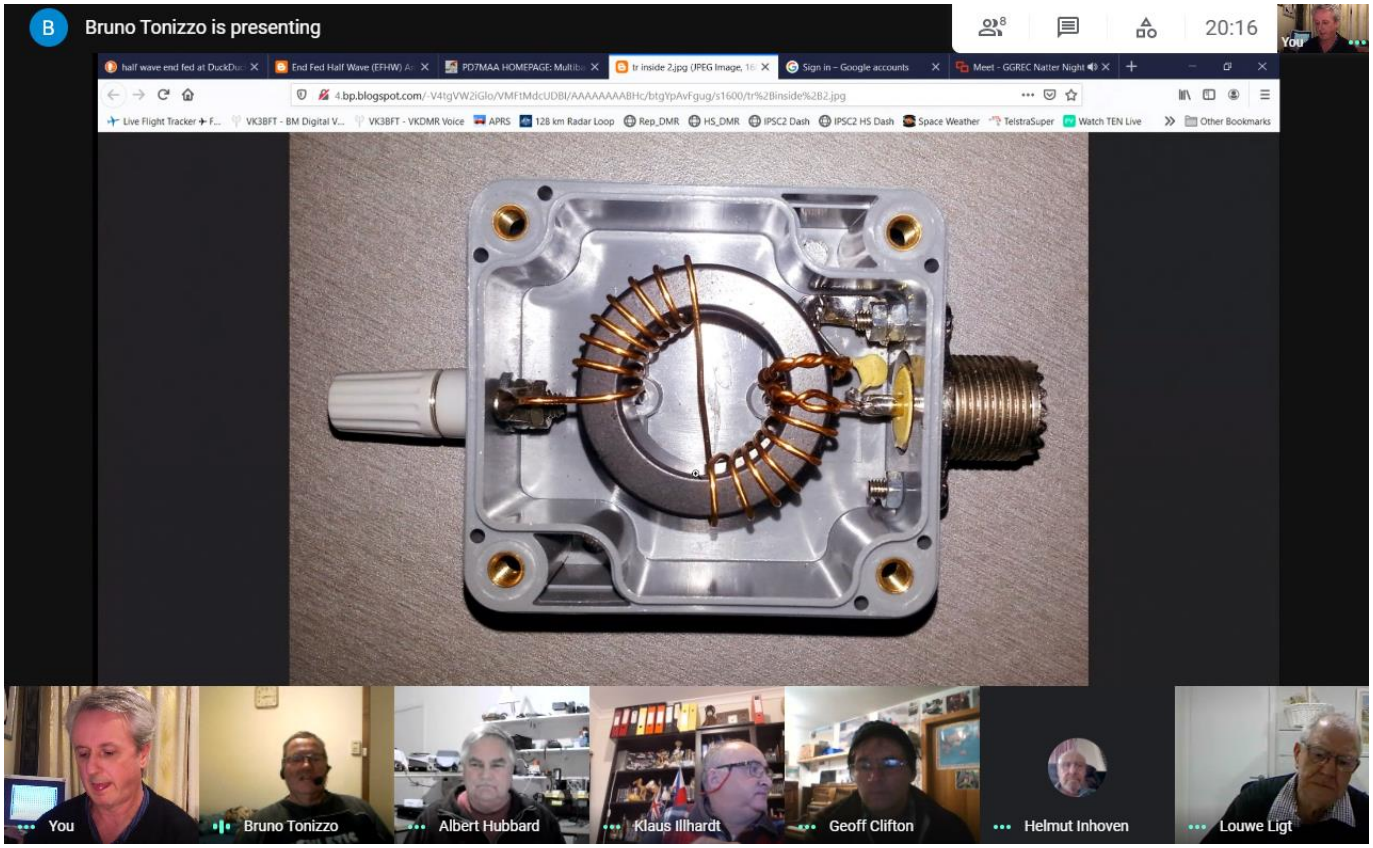
Interesting YouTube Videos

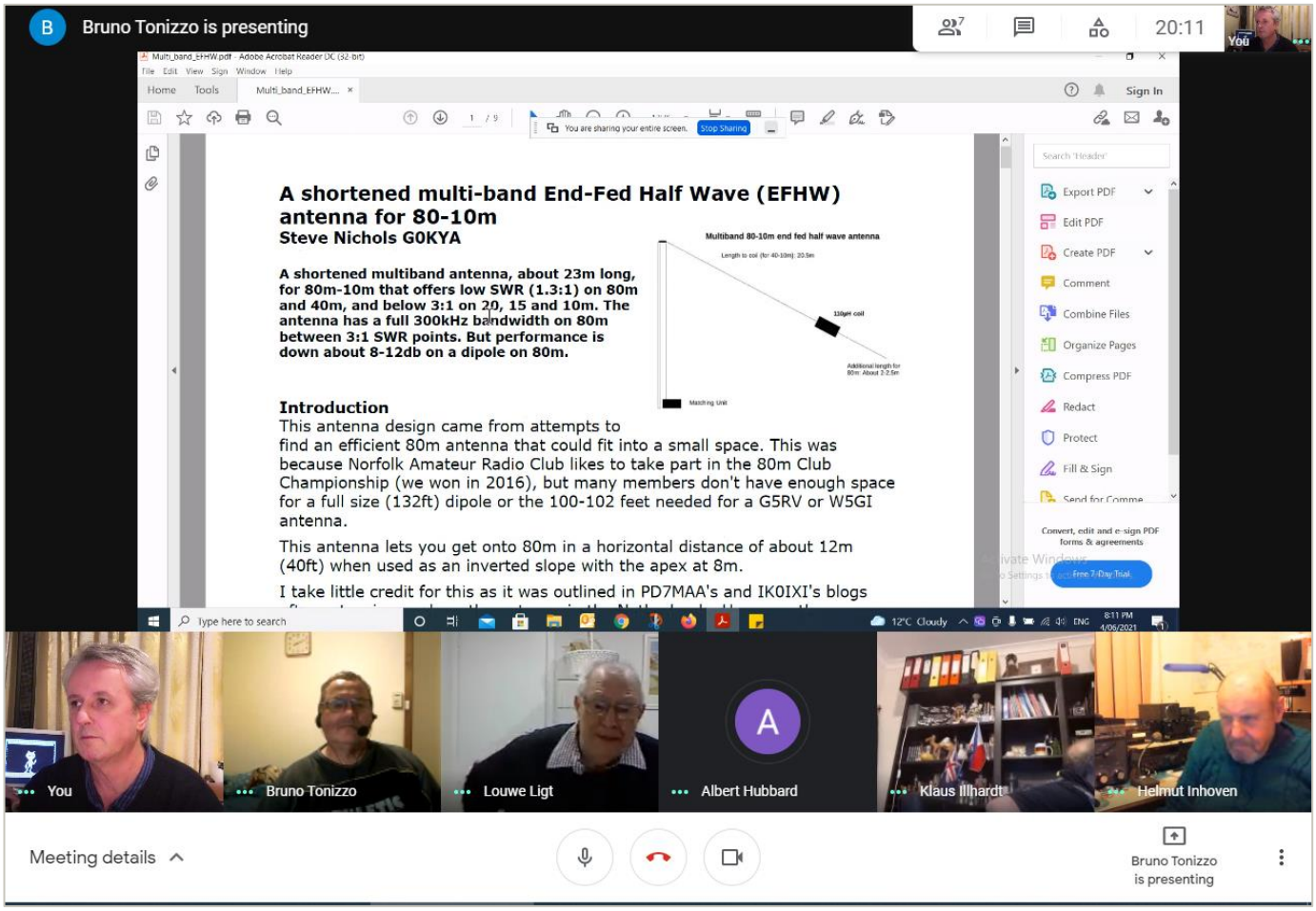


Intertemporal Communication *(Warning - HEAVY)*
https://youtu.be/aB6kQwZZm5k

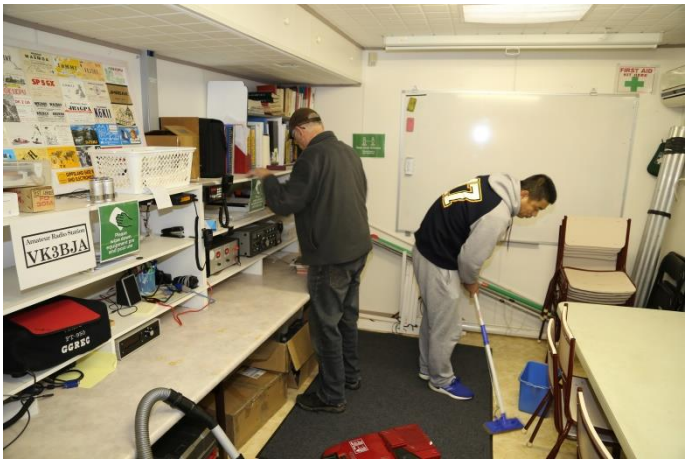
Stop RF "Radio Frequency" Interference!
https://youtu.be/tS7SvoT8Ivw

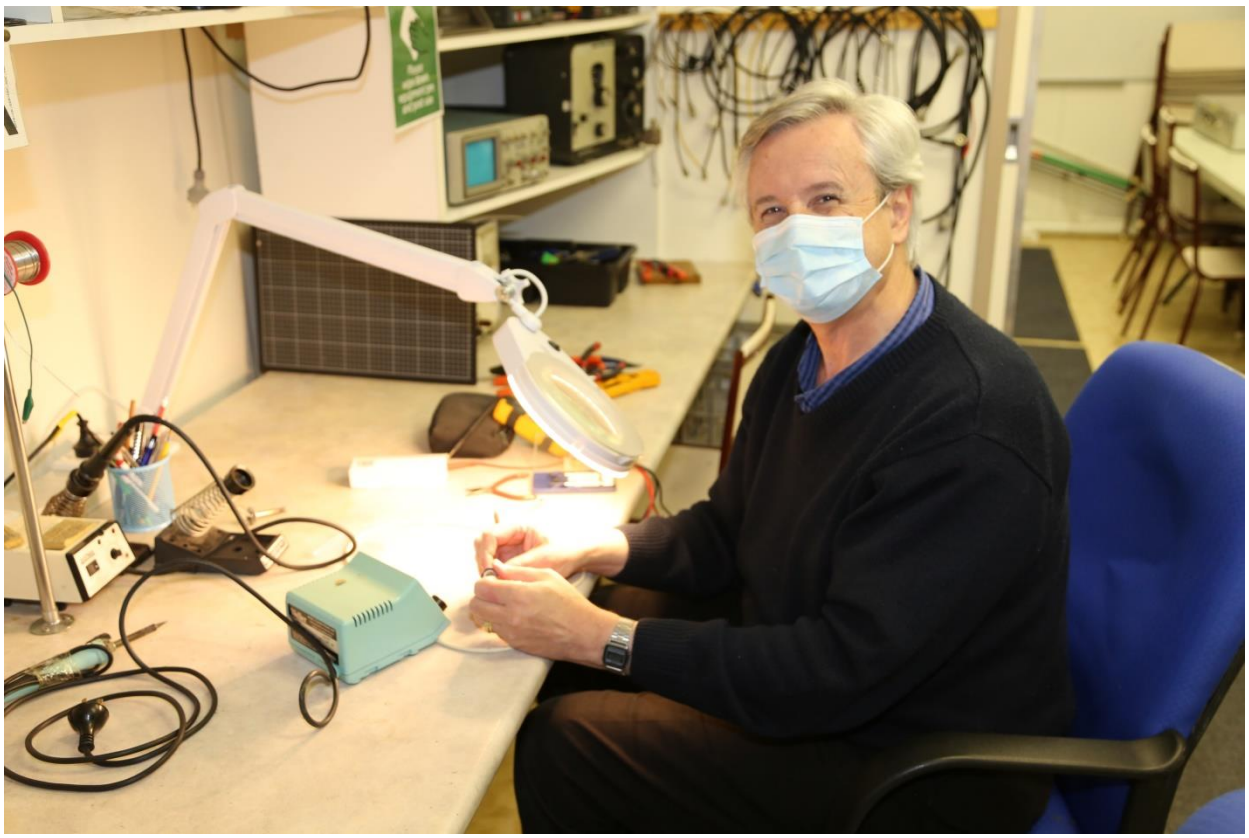
Natter Night 04/06/2021

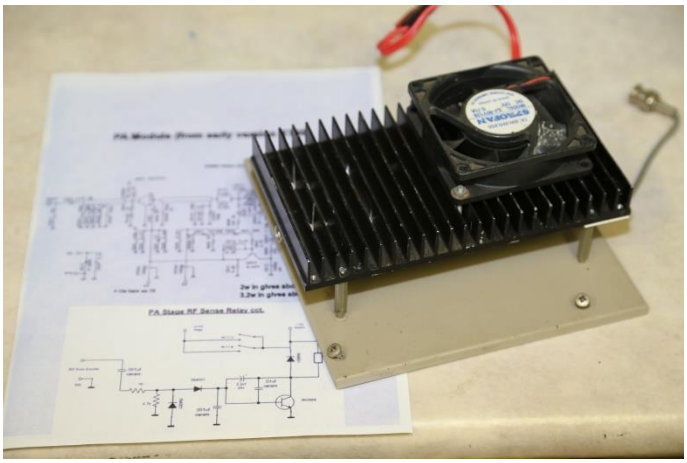




Working Bee 17/06/2021







ALL TROPHIES
alltrophies.com.au
Specialising in Corporate Awards Clubs and Schools

- Honour Boards
- Acrylic Awards
- Silverware
- Plaques
- Clocks & Barometers
- Medals & Badges
- Club Awards
- Engraving
- Corporate Awards
- Sport Awards
- Customised Awards
- Brass/Bronze
- Photo Plaques
- Commercial Engraving

03 9762 4844
sales@alltrophies.com.au
ABN 69 089 590 590
71 Intrepid Street
Berwick VIC 3806

WIRELESS INSTITUTE OF AUSTRALIA

WIA Affiliated Club

The GGREC is an affiliated club of the WIA

We also give Thanks to

Jaycar Electronics

ALTRONICS
Build It Yourself Electronics Centre®

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

President	Bruno Tonizzo	VK3GHM	Web Master	Mark Clohesy	VK3PKT
Admin Sec	Miguel Vaca	VK3CPU	Magazine Editor	Paul Stubbs	VK3TGX
Treasurer	Klaus Illhardt	VK3IU	Property Officer	'committee'	
General 1	Bruce Williams	VK3BRW	Assoc. Secretary	Miguel Vaca	VK3CPU
General 2	Leigh Findlay	VK3FACB			

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 433.575MHz Out 438.575MHz CTCSS 91.5Hz **offline**
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)

Magazine Articles to editor@ggrec.org.au Cut off, 10th of the month
All other Club correspondence to: secretary@ggrec.org.au
or via post : GGREC, 408 Old Sale Rd, Drouin West 3818
GGREC Web Site & Archive may be viewed at: www.ggrec.org.au
Website errors, contact web master: webmaster@ggrec.org.au
Facebook Page www.facebook.com/GippslandGate