



GATEWAY

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

February 2021



VK3RGW repeater 'moving'

Phantom Power Woes

Raspberry Pi Pico

And More



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

Event Queue

February:

19 th	General meeting, probably a 'Google Meet' teleconference – see club emails
26-28 th	CQWW 160M SSB contest

March:

5 th	Prac/Natter night, via video link?, see club emails
6-7 th	International DX Phone Contest - Courtesy WIA
19 th	General meeting, hopefully in person, Remember your mask
13-14 th	Commonwealth Contest (BERU) - Courtesy WIA
20-21 st	John Moyle Field Day - Courtesy WIA
27-28 th	CQ World Wide SSB WPX Contest - Courtesy WIA

<p>Club run events are only possible with the involvement of ALL members.</p> <p>Without volunteers to coordinate and participate in club events the club will fail to prosper</p>
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President's Paragraph, Postulation or Preamble.



Hello members and welcome to another Lockdown. Because of this constant state of flux, we have had to cancel our visit to the Cranbourne botanic gardens. We will reschedule this when we can. Hopefully this “circuit breaker” will be over on Thursday and we can still have a face to face meeting on Friday. If not, we will send out a G Meet email for a virtual meeting.

We have 4 plastic tubs of equipment, cases, bits & bobs for you to look through. These are from members who have items that are surplus to requirements. Any items left after the Feb (possibly March) meeting will end up in eWaste for recycling.

The 10am morning coffee chat is still happening on 70cm. If any members have a suggestion for a place to go for morning coffee or lunch, please send through your suggestions to the committee.

Paul is busy putting together Gateway. If you have any articles for the magazine/newsletter, please send them to the committee@ggrec.org.au

Your committee is moving towards Covid safe return of face to face (not too close) meetings, Natter/tech nights (currently – virtual) and working bees. There is a bit of maintenance to be done around the shack, antennas and repeaters. Subject to Covid restrictions the 70cm repeater will gain a 7MHz split on Friday 19th Feb. Please keep an eye on your email for updates and more news.

If there is anything that you would like to try or have a suggestion, please contact the committee.

That is all for now. 73s

Michael

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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.
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From The Editor



Wasting Time.

This month I kept feeling like I have just been wasting time, not usually intentionally, but in the end that's all my efforts seem to have come to.

Sometimes laying back losing a few hours can be rather therapeutic, like assembling this 'button box' out of left overs. I like the look, industrial button and transparent lid (with a touch of laser pointer for the pic). But what can I use it for? Marianna didn't like my idea of a self-destruct button for our house.

Then there are my various outings into losing a day or two trying to get a computer to do something, the problems usually stemming from a lack of, or outdated/wrong documentation. The amount of time I wasted trying to get 'Gstreamer' working on my PC and talking to OBS studio. Quite often the only info is what the original coders left, that amount to little more than notes to the next coder, or an online tutorial that should have been deleted as it refers to an older release, and all the names etc. have been changed. Yesterday I foolishly tried to get VLC media player to stream the desktop of one PC to another. Yes it should work, however the receiving PC's VLC just gives an all but useless response and drops out – or you can get a detailed report – again, almost a crash report, only usable by the authors.



So time to be more useful, so I dropped my tower to remove my Christmas star, and have a quick look at my malfunctioning 2m vertical stick. Unfortunately the bush that lives where the 2M ends up after being lowered had grown quite a bit, making inspection a touch difficult.

Several minutes with some pruning cutters made things better, however bad weather was on the way so I just got time to give it a once over and a quick 'wiggle' with an impact tool to make sure a corrosion diode was not present.

Of course that did not fix my 2M setup!

It's a rather strange fault in my eye, the antenna is a commercial 5/8 fibreglass whip, that uses a 2M beam as a ground plane. On 2m the reflected power is through the roof, even if I back my rig down to



2W I still get too much reflection to allow the rig to work. However if I feed 6M RF into it, all is well. Apparently a 2M 5/8 will usually be resonant on 6M, as is mine, the SWR been ok. This suggests to me that the feedline and antenna are all there, no opens or shorts. So why does 2M not work?

Oh well, I better get my Aldi petrol powered pole pruner out and give that bush a stern talking to so I can have a proper look at it the next time the tower comes down.

←← Vee groove for 2m whip!

VK3RGW repeater

For quite a while, the Club's 70cm repeater VK3RGW which is based at Cranbourne has been suffering varying degrees of interference.

With the input frequency being within the LIPD range, it was inevitable that one day we would need to do something about it.

A small amount of luck, if you can call it that, has seen our other 70cm repeater (VK3RWD) being taken off the air for repairs and re-evaluation of need, so a spare duplexer (filter cavities) became available to use at the Cranbourne repeater if and when we were able to set up new frequencies for it. Rob (VK3BRS) and I spent an evening recently slaving over a hot spectrum analyser (actually I just supervised with a drink in hand) to retune the spare unit to the new RGW frequencies which will have a 7MHz offset and a receive frequency outside the LIPD range. With the hardware preparation complete, a software check for programming the repeater was needed as it is a Hytera commercial unit which was initially set up by the supplier and so we had to be sure we could make changes when the duplexer was changed. I found the time to test the software and Rob and myself were going to make the changeover to the new frequencies on the evening of 16th February but COVID had other ideas which gave us a 5 day lockdown. So we altered the date to the evening of Thursday 18th but who knows what will happen between now and then.

GGREC members will all have received an email detailing the changes and those who frequent the repeater should be ready for the change.

There is no anticipation of the changeover failing, however Murphy being what it is (or who) the success or failure will not be known until then so be prepared to switch back to the old frequencies if you cannot access RGW on the new frequencies on Friday morning. For those not receiving the notification email, the new details are:

Your radio receive frequency = 438.425 MHz

Your radio transmit frequency = 431.425 MHz

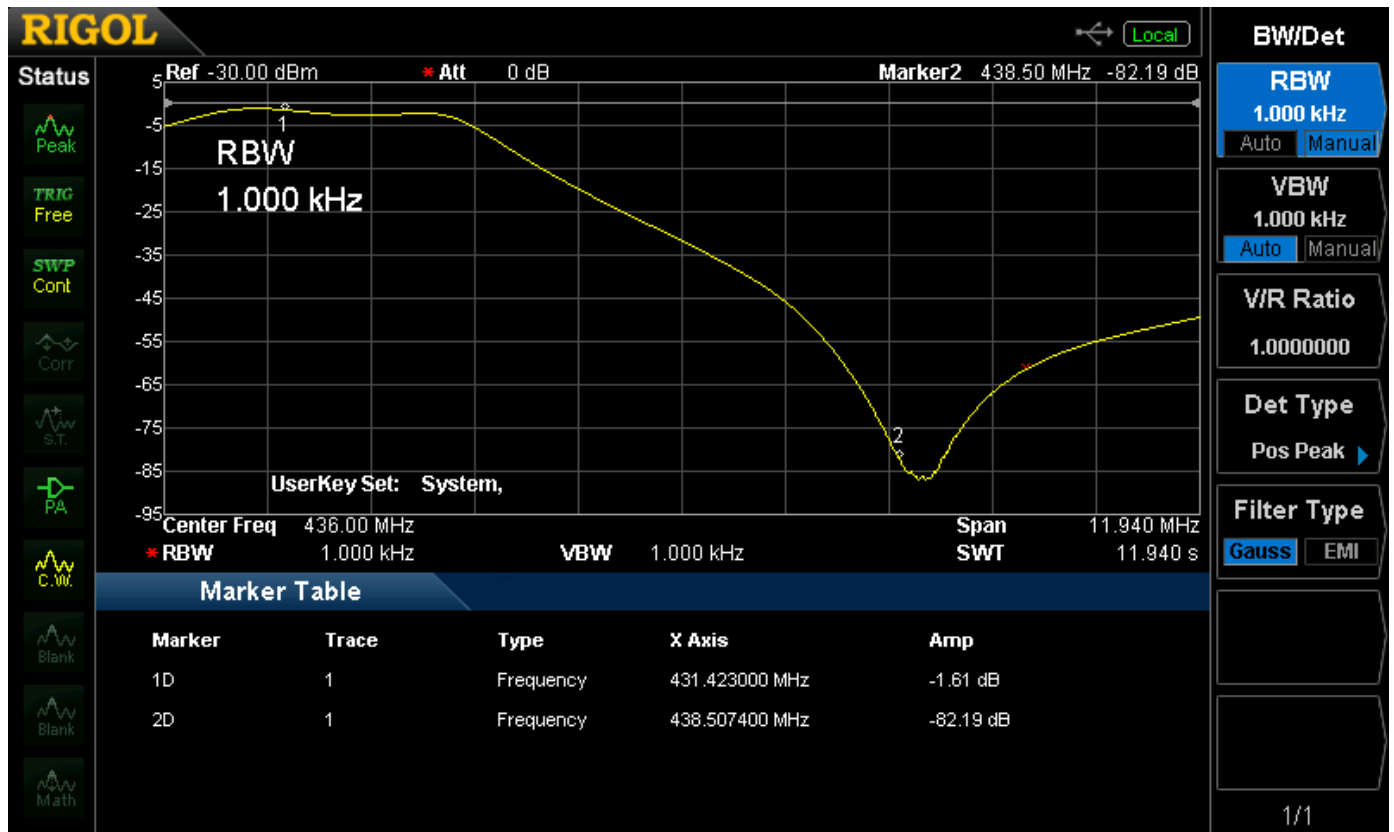
A CTCSS tone of 91.5 Hz will be required to access the repeater however this will be removed in the future with the hope that interference will not dictate its requirement.

Most transceivers make it easy to set up a new memory channel by simply adding the receive frequency plus a negative offset of 7 MHz but don't forget the 91.5 Hz tone as well. Keep in mind that unless you store the details into a memory channel, you cannot simply change your radio offset to 7 MHz then go to one of the other repeaters which mostly have a 5 MHz offset as they won't work. If you want to understand more about this, ask one of the technical people in the Club.

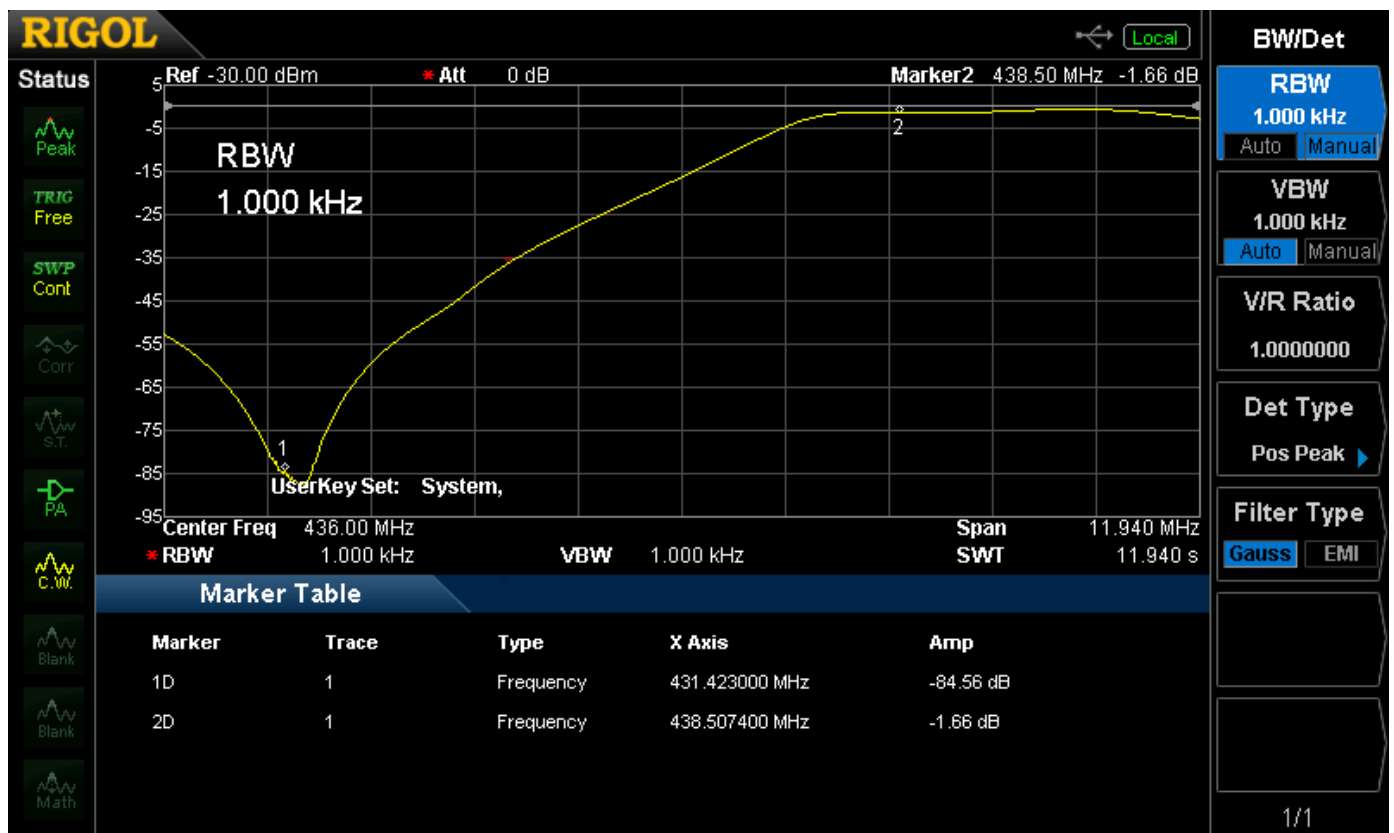
For the really technically minded, the spectrum analyser graphs have been reproduced for your viewing pleasure. If you don't understand what they mean, maybe an explanation talk can be arranged.

Many thanks to Rob (VK3BRS) for performing the retune and working with us to make the changes.

Albert VK3BQO



RX pass TX reject



TX pass RX reject

A picture of the overall VSWR is on the mag's front cover.

Phantom Power Woes



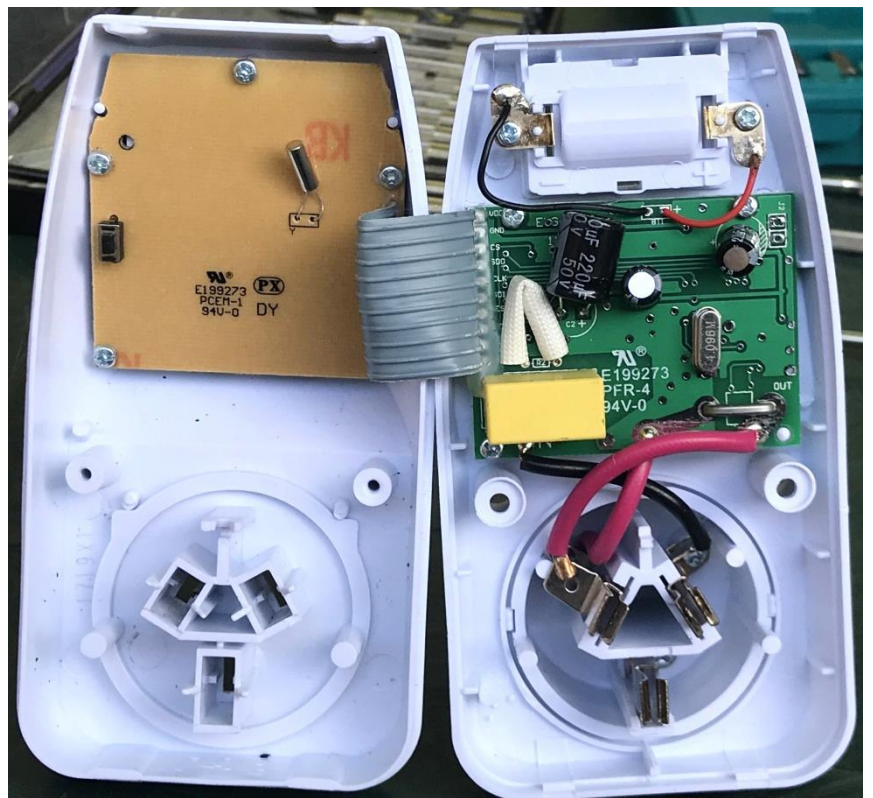
Recently, I hooked an AC power meter up to my lounge room entertainment cabinet/TV stand/Hi-Fi system and was shocked with what I saw. With the TV in standby and the rest of the equipment sitting idle, with no output, the meter was reading 75W. This cabinet also houses an amp that feeds speakers throughout my house, including my shack/workshop, which is a separate building. Quite often I will use this setup so I can listen to a radio net etc., or just some music whilst I go about my daily activities without being tethered to a speaker in a particular room. It also kind of doubles as an 'intercom' so Marianna can summon me to give her a hand. I was thinking about my next project, an alternative lower power amp to feed my network of speakers, but before getting too carried away, just how much power does the current rig use, is it all worth my time & trouble. I was hoping the amp would be 5W or better, with a few more watts for sundry items, I was not ready for the reading I got, which was with all the gear idle. So I started flipping switches and pulling plugs. Two big problems, quite a lot of the gear does not have a proper mains power switch (when is the last time you saw a real switch on a video recorder?) and everything is plugged into power boards at the very back of the cabinet that are not exactly easily accessed. Another problem, way more prevalent these days, is that a lot of the accessories run off a plug-pack of some sort, so even if I fit a switch to those missing one, that still leaves all the plug-packs powered up. How bad can that be? - about 50W, ouch. About now I was starting to question the accuracy of my no name power meter. It is a model MS6115, from Electus Distribution. Measuring AC power is not a simple task, even measuring the AC mains voltage can be problematic. If you have a perfect AC waveform, 99.9% of meters will get it right. However with all the non-linear loads out there, (99% of electronics) the waveform is usually quite distorted, and the current waveform probably far worse.

If you are measuring a resistive load (heater, toaster, kettle) it's easy, no distortion and the current waveform it is sync with the voltage waveform, so just measure the volts and the amps, multiply them together, job done. With complex loads, like a power supply, you really need to digitize both the voltage and current waveforms with a decent bit of resolution, then do a pile of maths to give you a true reading. I doubt my little power meter is that flash inside.

I measured the various cabinet loads using two different techniques, the first was to put the power meter into the mains system input lead (I have that out where I can easily turn off everything) measure the whole load, then disconnect one item and calculate its load by taking the after reading from the before reading. This was not going so well, so I went for the far more awkward (in this case) method of plugging individual item straight into the meter. These two methods should give identical results, however that was so far from what I was getting that it was all but a joke. For example, a MeanWell based 13.8V supply using the two methods gave 9W & 4W respectively, more than double or nothing. I'm definitely going to have to upgrade my equipment. Seriously, how can any designer put out such a poor meter? Now don't get me wrong, I'm not exactly expecting NATA lab certified results, however 4.0W to 9.0W, less than one digit of accuracy, is an absolute joke, in a world where a 3.5 digit DMM is below par.



This is the second one of these for me, the first one, which I seem to recall being named 'Arlec', died, then I spotted this one, that, apart from the missing name, looked all but identical. Pity I didn't know.....



So it was take it apart time to see just what I got – or is that 'didn't get' for my money.

These days it's kind of hard to figure IC's out, especially with IC's like the ESP series of Wi-Fi processors that don't look especially great on the outside, but boy do they pack a wallop inside, and do so for an extremely small price.

This is not one of them....

I had all but compiled a three page list of devices and the power they consume. However I am now more inclined to think I have been well and truly led up the garden path.

As a crude way of checking this, I left the system on today for several hours, I then proceeded to run my hand over those offending power supplies that are supposedly burning 28W after adding a few switches and losing a few loads. I didn't perceive anything of that order – heat wise. I'm sure if I left a 28W soldering iron in there, things would be a lot hotter.

I was going to publish my list of loads, however with all but zero confidence, what is the point.

If you read my other article about the Raspberry Pi Pico board, you'll know I have 3 in the post. With their 12 bit analogue to digital converters, they are looking more and more a good way to make decent measurements of the real power consumed. I had wanted to build one in the past to compliment my solar install and let me know what my power position was, as in am I using, or supplying power back to the grid. Measuring the AC voltage waveform is dead easy, just pick a power point and go for it. However the household current consumption is a whole lot harder.

Years ago I acquired a clamp meter probe accessory for use with a multimeter. I was going to crawl up into my roof space and leave it permanently around the power cable coming into my house. Unfortunately I later found that the cable I wanted to 'probe' was built like a coaxial cable. There is no way I can access just the active conductor. There are commercial units out there that you install in your meter box, they are basically a clip on current transformer, the results being wirelessly beamed out of the meter box to a little display unit. Trouble is these are probably no better than my plug in power meter, as they only measure the current, not the voltage, and as such cannot assess the power factor, and as such only give a very poor guess.

I need a really clued up sparky who knows how to legally install a current transformer, and more importantly how to get that signal out of the meter box and into my power meter project. Without giving my household insurance provider something to use against me. So for now I'll be limited to making a version of my little power plug that actually gets it right.

So it's back to the soldering iron, installing power switches wherever I can, and to curse crowds like Roku who make all these media playing add-ons for your TV (Telstra Roku TV box) that have no off function and just sit there 24/7 running quite hot to touch. Boxes that usually defy ones efforts to open them, and if/when you do, find it all but impossible to fit a switch. Then realising it's running off another power brick 'down the back hidden between the TV cabinet and the wall, probably half covered by a curtain. (quick, where is my fire insurance policy) Of course, if it's hard off, then you have kind of defeated the purpose of its remote control...

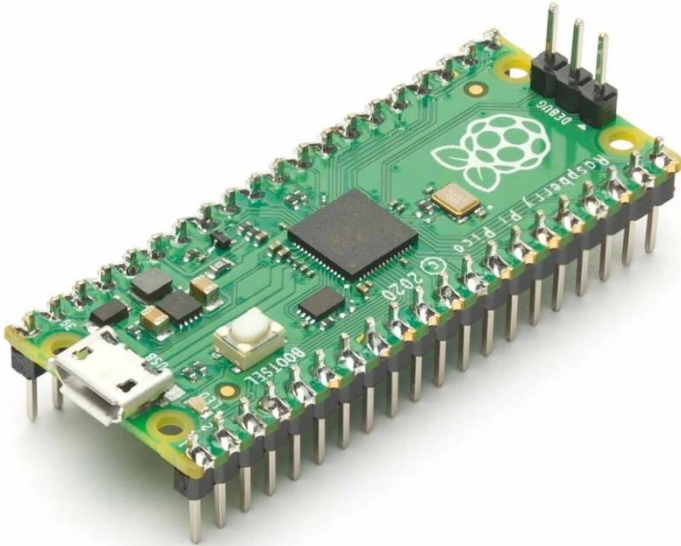
Or should I make a multi outlet power board where all the outlets are individually switched? And how would I control it – a phone app, yuk – I don't really want to go there.

It seems that any new tech these days has to have a phone app, personally I don't walk around my house with a mobile glued to me. When I get home, first order of business is to lose the phone (preferably switched off) If they want me there is the land line (on voip now) for that, or just send us an email.

Darn, am I over thinking it again?

Paul VK3TGX

Raspberry Pi Pico



This is the latest offering from the Raspberry Pi foundation, it is not a new version of the Raspberry Pi computer that they have been producing (with great success) but rather a micro-controller. Think Arduino and you will be very close to the mark.

Unlike the Raspberry Pi computers, where you connect a keyboard and monitor then set about using/programming them, no this you use like an Arduino. You write your code on a regular computer, then download it to one of these to run your code.

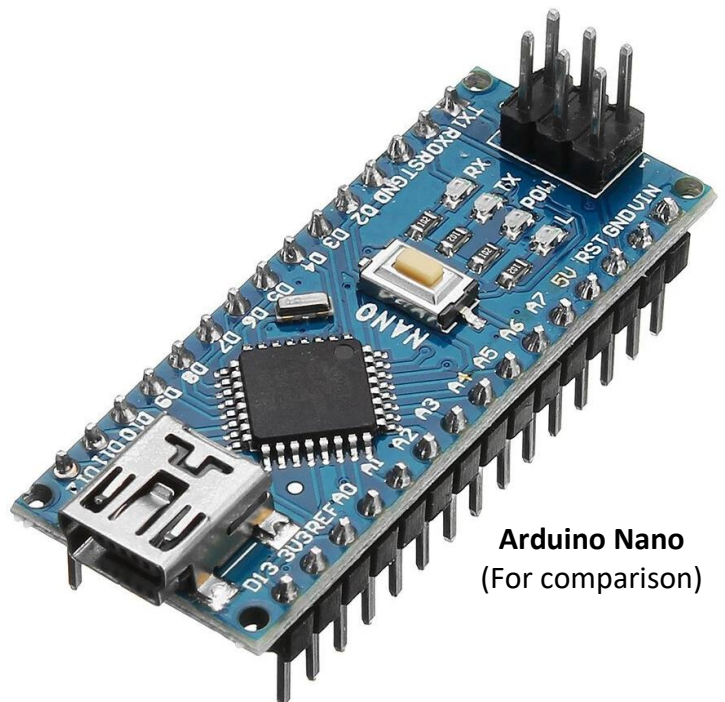
Like an Arduino, you can write your code in the 'C' language, however you don't get the Arduino add-ons, so it is a more 'pure' C experience. Some people dislike the Arduino modifications to C, however they never bothered me, I found their whole setup fairly friendly, and I could get useful code running in not much time. I would not be surprised however if someone integrates these into the Arduino system.

Of more interest, is that these can also be programmed in Python (Micro Python), an extremely popular language these days. Python is available on most computing platforms, and is one of the options offered for students to program the original Raspberry Pi computer boards, that were originally created to foster computer skills in schools over in England.

How you get your Python etc. code into this board is also rather different, you connect it up to your computer via USB, however as you are plugging it in, you press the button near the USB port and the Pico will appear as a USB memory stick to your computer. In it there is a pile of useful files along with a folder for you to put your program code into. On the next power-up the Pico will then run that code for you.

The Raspberry Pi Pico is also way more powerful than, say a Arduino Nano, the Nano uses an Atmel ATmega328, an 8 bit chip running at 16MHz, with 32K of flash memory, with 8 x 10bit A/D etc.

The Raspberry Pi Pico on the other hand runs an RP2040, a Dual core ARM cortex M0+ at up to 133MHz – with overclocking options. It has 2MB of flash storage 264K RAM, 26 general purpose I/O pins, of which 4 can be 12bit ADC, 500K sample/sec inputs. It also has 2 UARTs, 2 I2C, 2 SPI, & 16 PWM channels, and it is fast enough to drive a VGA monitor.



Arduino Nano
(For comparison)



As a demo of this things power, have a look at <https://youtu.be/WaPJmCgseQw> where they have it emulating a complete BBC micro – albeit with a touch of overclock.

However the biggest thing that has caught my attention is the price, and where to get it.

If you buy an Arduino Nano in a shop, expect to pay near \$30, I have tended to buy mine online from Banggood, where they are currently listed at \$3.93. I have used a few of these in various projects, projects that would probably be impractical at the \$30 price point.

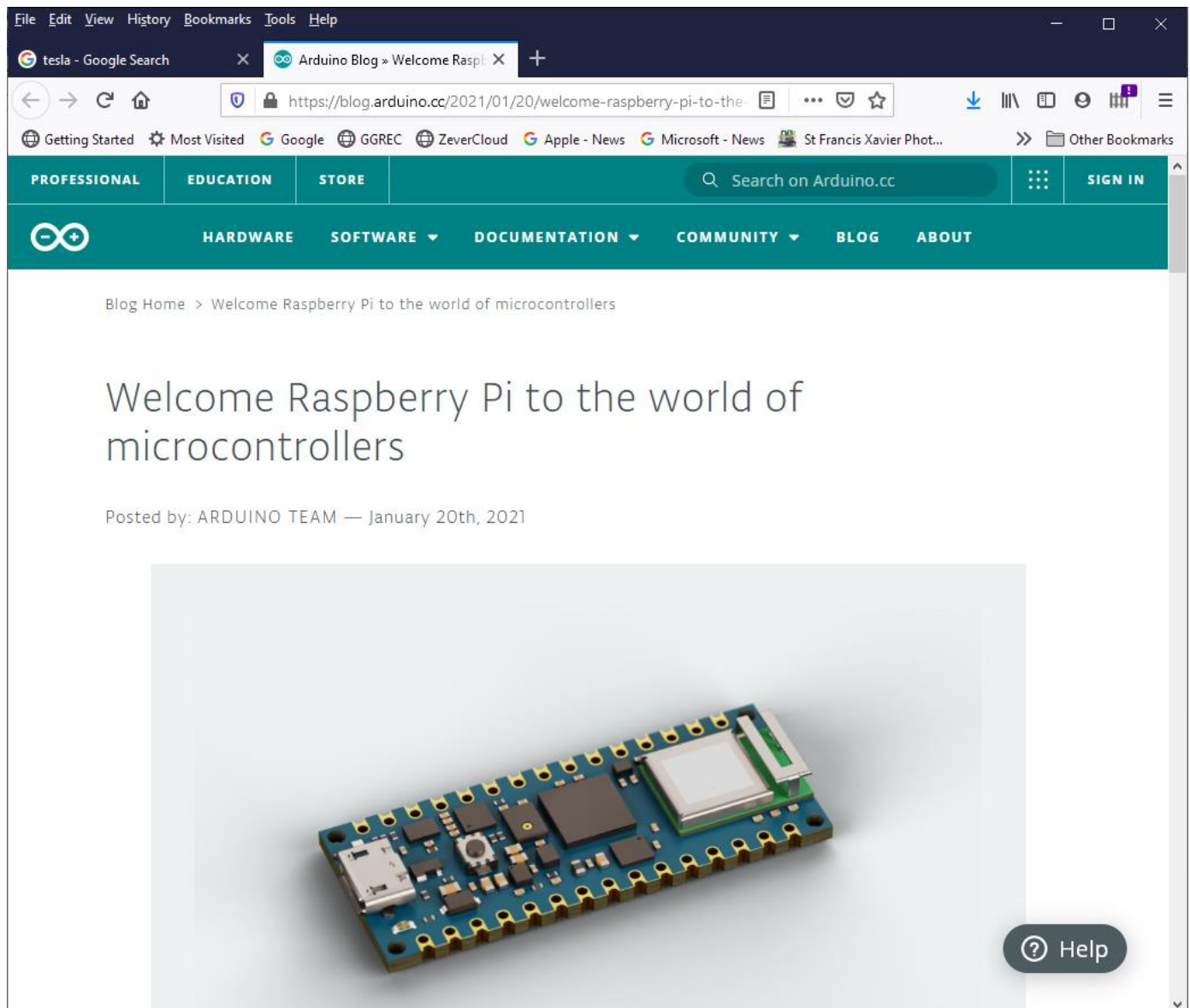
However the Raspberry Pi Pico is currently listed at \$5.75 from two Australian suppliers, the only catches are \$8 post, and no header pins – the header pin version is \$13.75, so I think I'll just solder on my own. (They must be using local celebrities to do their soldering!)

I was originally shocked by the postage, more than the price of the part, however when I upped the order to 3 units, the postage was the same. I'm not sure how many can be ordered before they bump the postage charges up, however 3 seemed a good sweet spot for me, until I get more familiar with them, although I can see no real impediment to success at this point.

Unfortunately mine are still in the post, so I have yet to have any hands on experience with them, not that I could have done much before this article was due out.

Download a copy of Python and get playing, it has a fair few attributes of Basic, in that it's an interpreted language – no compiling etc. required. Have a look around the web there are plenty of resources out there to whet your appetite.

Then I stumbled on this page...



It looks like the Arduino team have taken the new RP2040 (the actual IC on the Pico) and spun up their own version....

“We started from the Nano format with its own tiny footprint, leveraging on some of the existing key features of other Nanos like the versatile u-blox NINA WiFi and Bluetooth module. The goal being to enable people to develop connected products leveraging our hardware powered by Raspberry silicon, a solid radio module with exceptional performance, and the Arduino Create IoT Cloud.

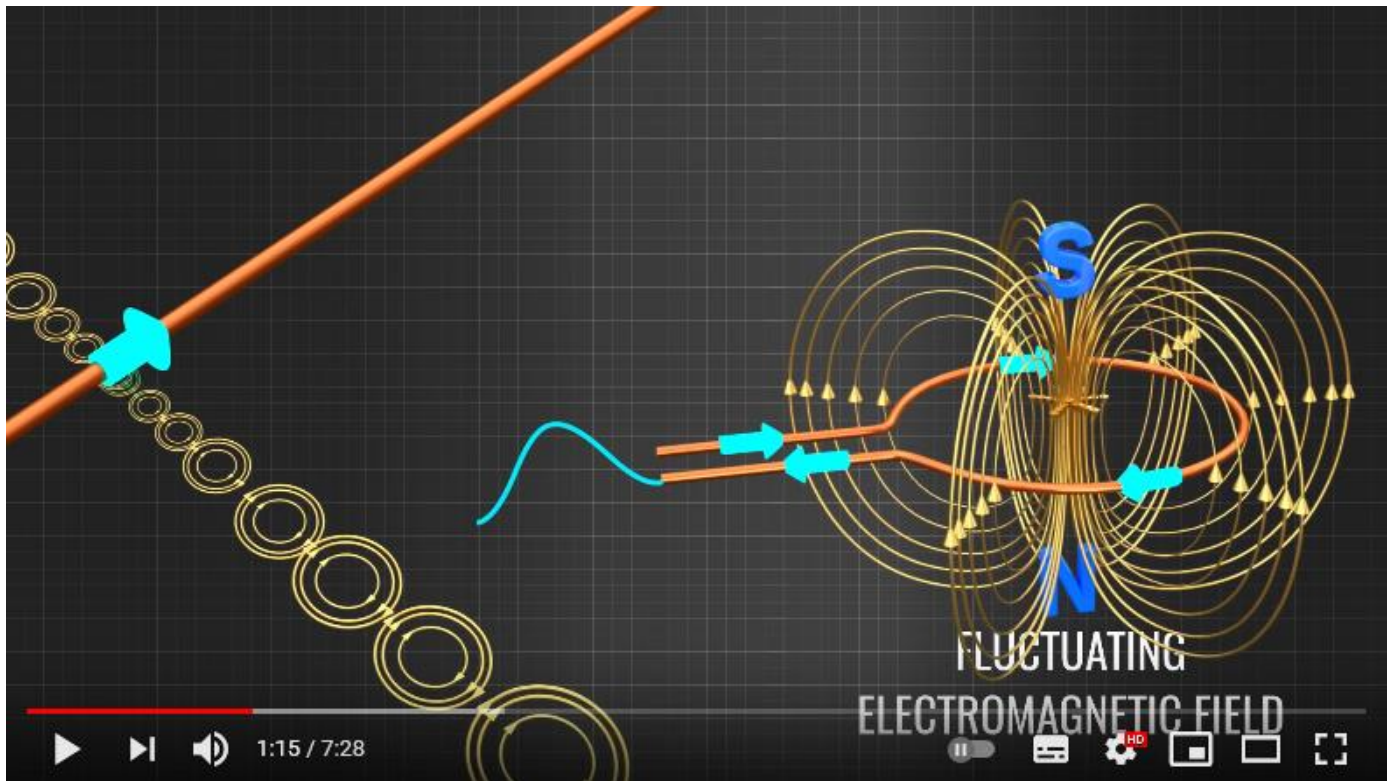
The new board will come packed with some high-quality MEMS sensors from STM (namely a 9-axis IMU and a microphone), a very efficient power section, and a bunch of other innovations that you can already spot from the design.” — Massimo Banzi (co-founder & chairman) and Fabio Violante (CEO)

<https://blog.arduino.cc/2021/01/20/welcome-raspberry-pi-to-the-world-of-microcontrollers/>

Less I/O pins, but way more functionality, 16Meg flash...

Paul VK3TGX

Interesting YouTube Videos



Understanding Electromagnetic Radiation

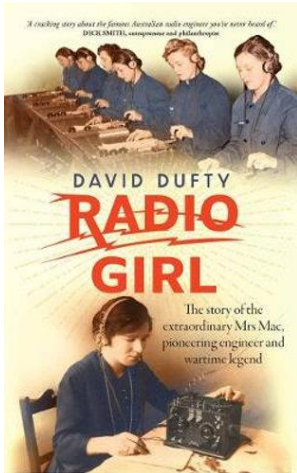
https://youtu.be/FWCN_ul5ygY



Raspberry Pi Pico - microcontroller - getting started with MicroPython

https://youtu.be/lQVIjC_N8Tc

Book Review



Radio Girl

by David Dufty

Biography

The story of the extraordinary Mrs Mac, pioneering engineer and wartime legend.

Published: 28th April 2020 Allen & Unwin

ISBN: 9781760876654

Number of Pages: 312

Description

All around Australia, former WRANs and navy men regard the woman they know as Mrs Mac with a level of reverence usually reserved for saints. Yet today no-one has any idea of who she was and how she rescued Australia's communication systems in World War II.

As you climbed the rickety stairs of an old woolshed at Sydney harbour in 1944, you would hear the thrum of clicks and buzzes. Rows of men and women in uniforms and headsets would be tapping away vigorously at small machines, under the careful watch of their young female trainers. Presiding over the cacophony was a tiny woman, known to everyone as 'Mrs Mac', one of Australia's wartime legends.

A smart girl from a poor mining town who loved to play with her father's tools, Violet McKenzie became an electrical engineer, a pioneer of radio and a successful businesswoman. As the clouds of war gathered in the 1930s, she defied convention and trained young women in Morse code, foreseeing that their services would soon be sorely needed. Always a champion of women, she was instrumental in getting Australian women into the armed forces.

Mrs Mac was adored by the thousands of young women and men she trained, and came to be respected by the defence forces and the public too for her vision and contribution to the war effort. David Dufty brings her story to life in this heart-warming and captivating biography.

Review

I have not been particularly interested in biographies or autobiographies in the past but the history buff in me has started to be, particularly in the histories of technical subjects and advances.

The story of Violet McKenzie (nee Wallace) is a fascinating part of Australian radio and telegraphic history. She was Australia's first woman electrical engineer and pushed electrical safety to the government and the public. Violet was a radio amateur. She wrote books, one being the first "All electric cookbook" and others on electrical safety.

Her exploits are told as a strong businesswoman with her own electrical company and retail radio stores. The Wireless Shop in George St, Sydney that carried everything radio, was one of them.

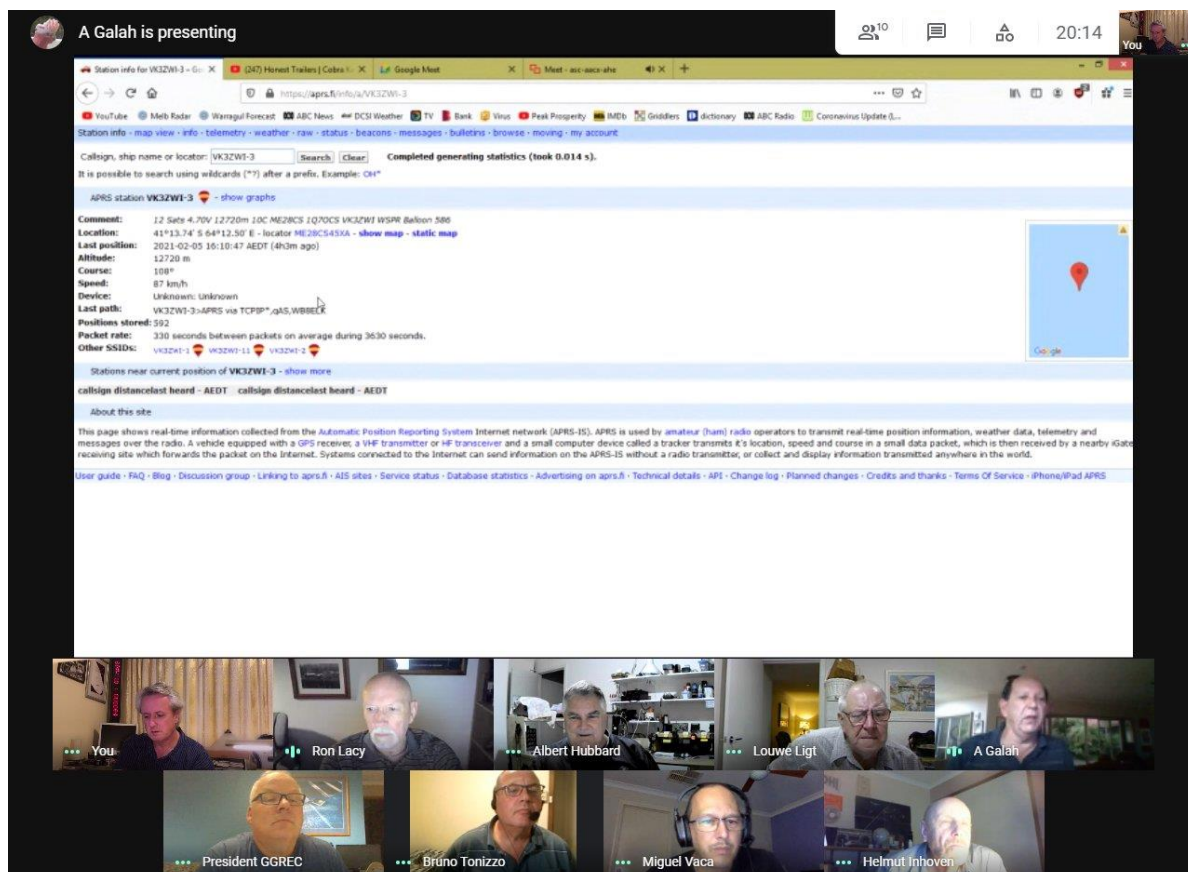
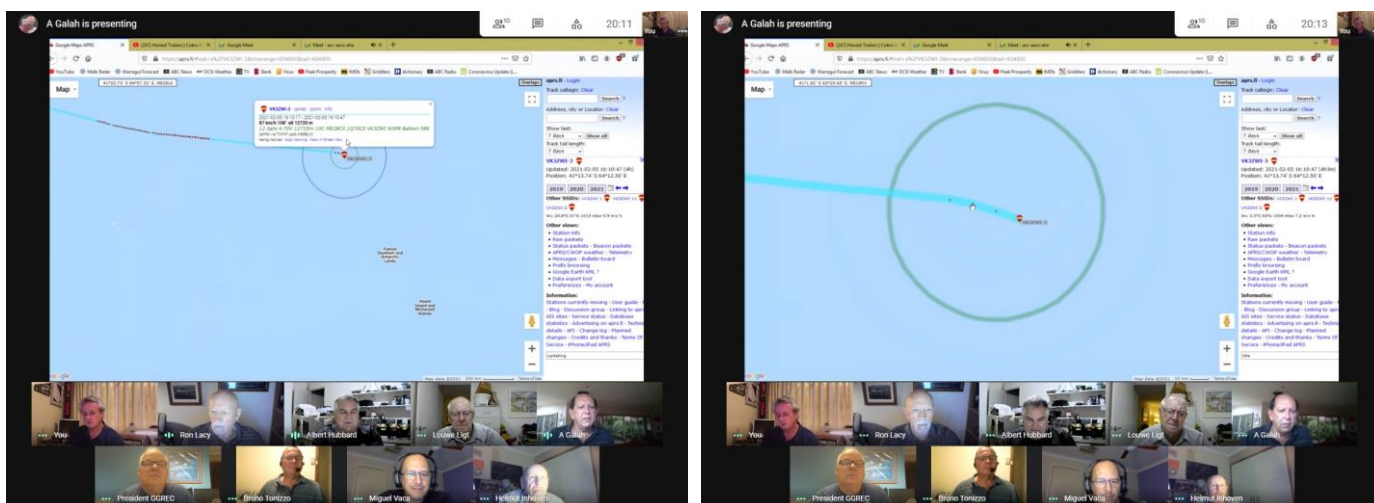
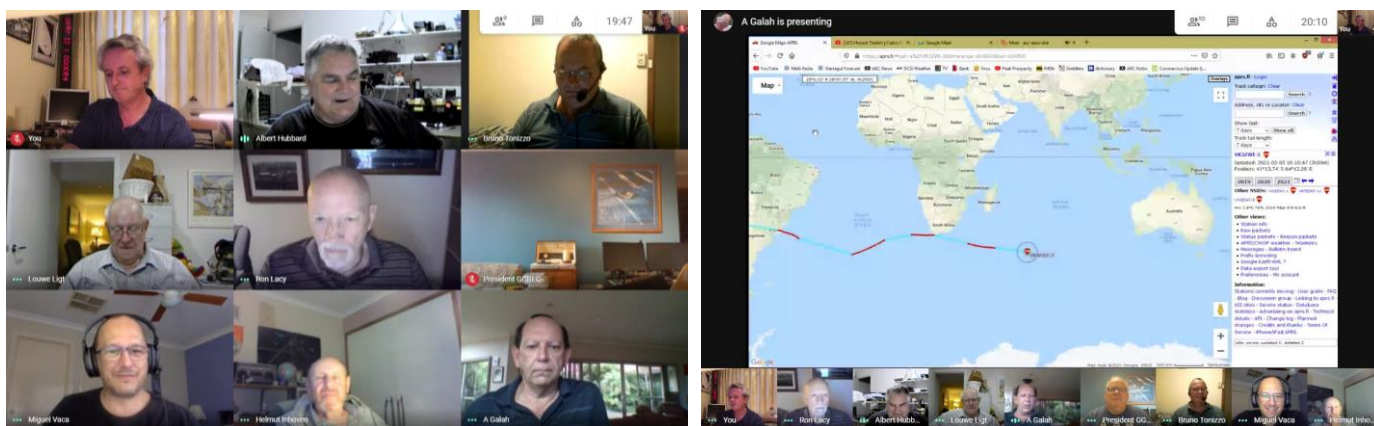
This is a wonderful book, telling of the life and times of Violet McKenzie OBE, is easy reading and highly recommended.

Michael VK3GHM. Review from my own personal copy.

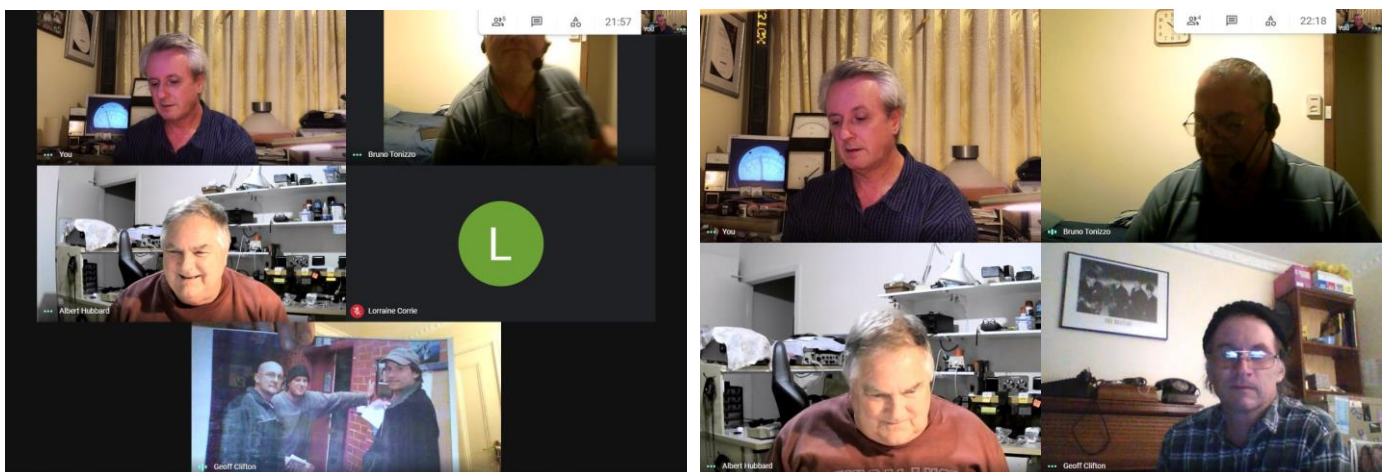
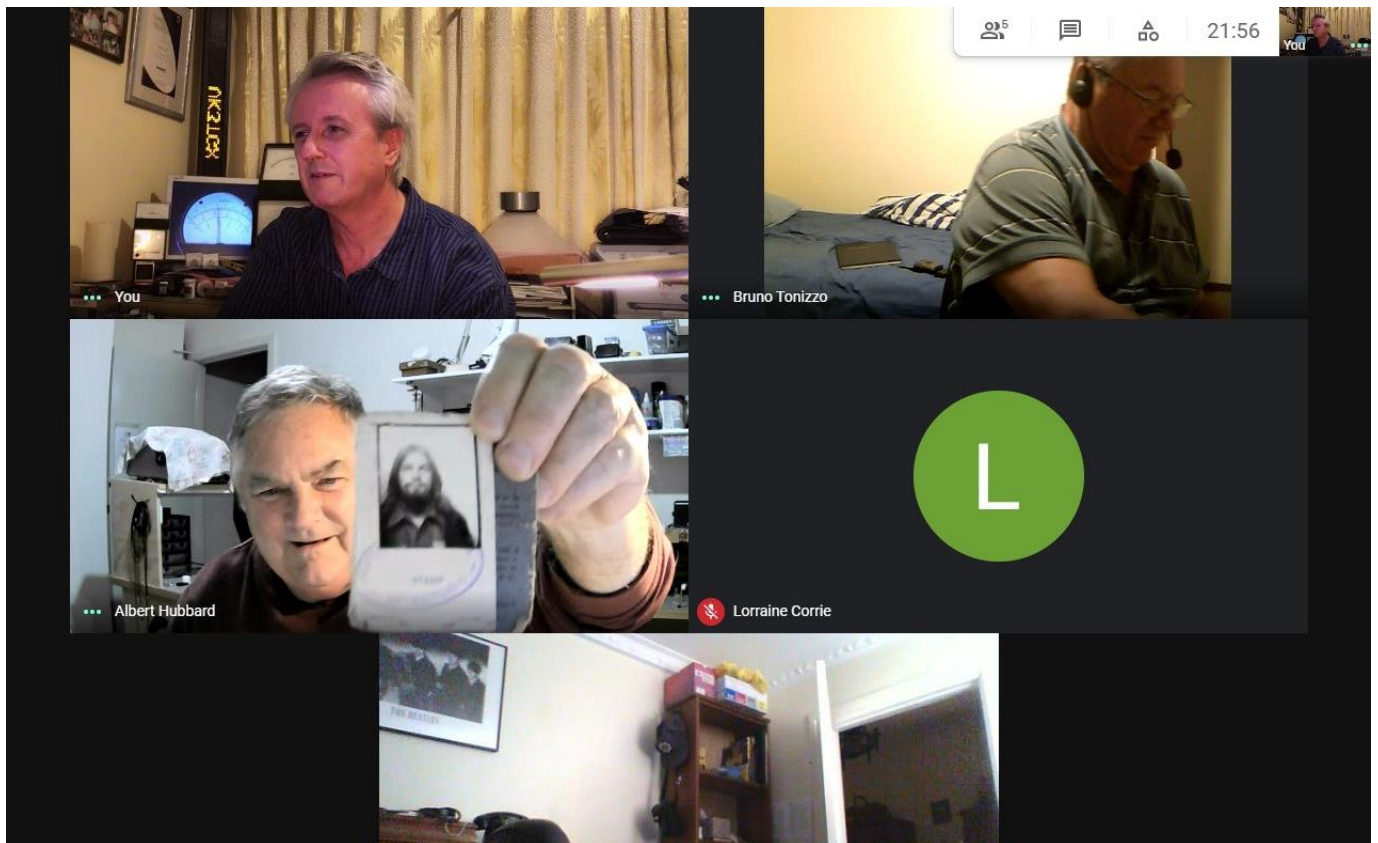
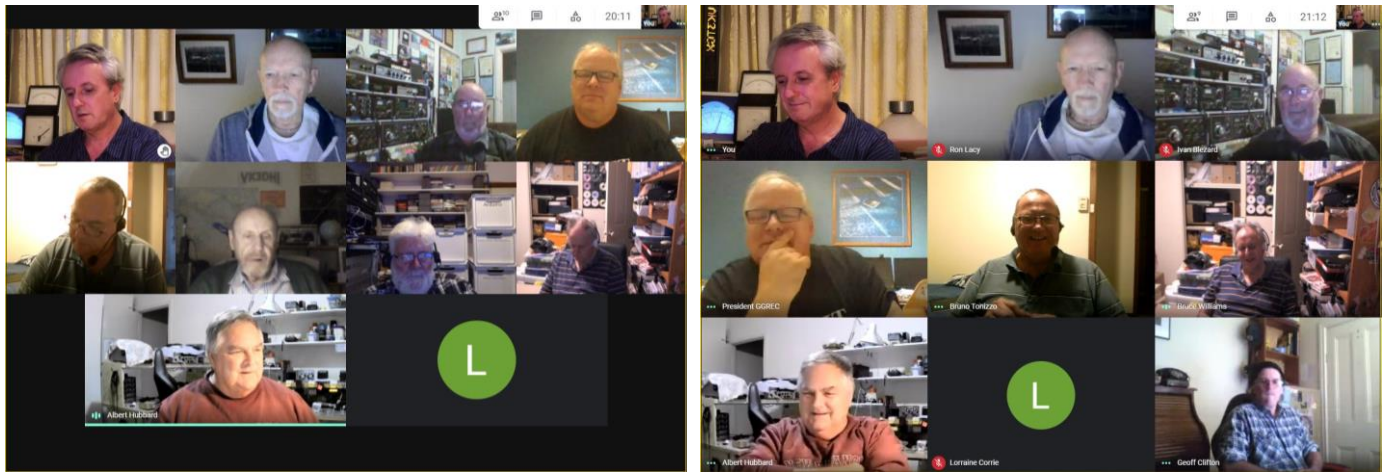


As Seen on Google Meet

Natter Night 05/02/2021



General Meeting 15/1/2021





The GGREC is an affiliated club of the WIA

WIA Affiliated Club

We also give Thanks to



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

All physical meetings suspended due
to the coronavirus restrictions

President	Micheal Van Den Acker	VK3GHM	Web Master	-	-
Admin Sec	Bruno Tonizzo	VK3BFT	Magazine Editor	Paul Stubbs	VK3TGX
Treasurer	Albert Hubbard	VK3BQO	Property Officer	'committee'	
General 1	Bruce Williams	VK3BRW	Assoc. Secretary	Bruno Tonizzo	VK3BFT
General 2	Paul Stubbs	VK3TGX			

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 434.475MHz Out 439.475MHz 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
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