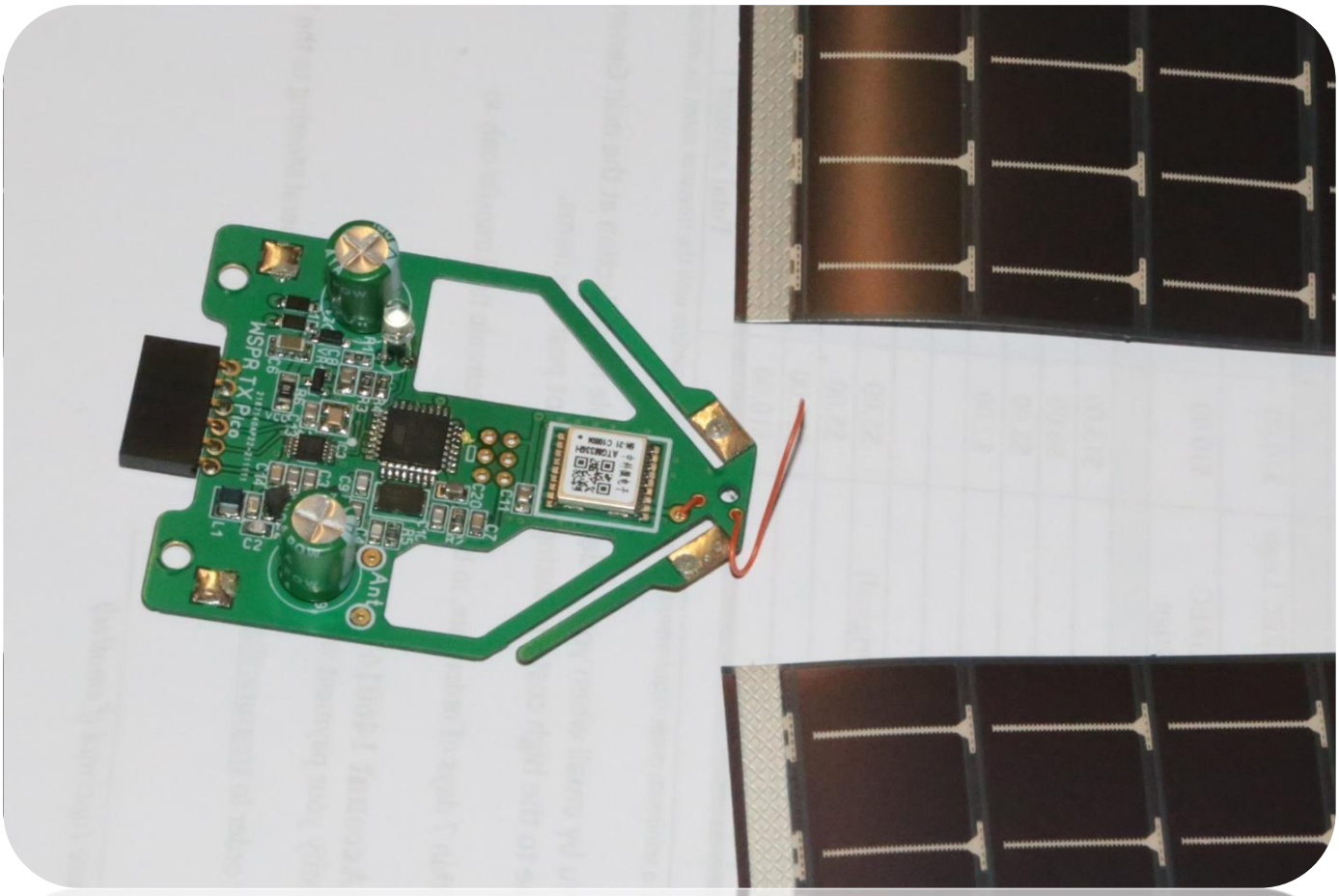
GATEWAY

The Official Magazine of the Gippsland Gate Radio & Electronics Club Inc A0016893M

August 2022



A Case of 'ANT'enuation

Raspberry Pi Pico

More Audio / HiFi Fun

And More

WIA Affiliated Club

Cover photo, A ZachTek Balloon WSPR transmitter, Robbie Xin VK3XIN – see the Nov 2020 mag
(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

August:

19th	8:00	General Meeting
20th		International Lighthouse and Lightship event
21st		Bunnings Sausage Sizzle at Bunnings in Cranbourne

September:

2nd	7:30	Prac Night
16th	8:00	General Meeting

October:

14-16th		Jamboree of the Air (JOTA)

November:

24th		Synchrotron visit

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 for August 2022

Well I can't wait for this month to be over. On Saturday the 20th of August, GGREC will be participating in the International Lighthouse and Lightship event. Thanks to Klaus VK3IU for all his hard work planning and organising this activity for the Club. On Sunday the 21st of August, GGREC will be holding a Bunnings Sausage Sizzle at Bunnings in Cranbourne. Thank you to all the members that have volunteered to help on the day, raising much needed funds to help pay for the Club running costs.
It should be a great day and I'm sure we will have a laugh or two while cooking and serving sausages.

At the August General Meeting Albert VK3BQO and Rob VK3BRS will be presenting part 2 of the informative talk on Amateur FM repeaters. Part one was very informative and the practical demonstrations were excellent. I'm sure we will all be looking forward to Part 2.

I know that the next Annual General Meeting is eight months away but I would like to announce that I will not be standing for a Committee position for the 2023 – 2024 Club year. I have lots of other interests that I would like to pursue and as such I will have to back away from the Committee. I will support the new committee so I will not disappear completely. The Secretaries position is currently vacant and I would appreciate some help from the membership to fill this position and lighten the load on Klaus and myself. GGREC is a great Club with all the assets and opportunities and great members that you could wish for in an amateur radio Club. It is your Club so keep it going and make the most of it.

In October we have the Jamboree of the Air (JOTA) event where we will be providing radio communications at our Clubrooms for the Cranbourne Guides. This has always been a relaxed fun event and only takes up a few hours of your day. GGREC has been providing radio communications for the Guides for over 25 years, a partnership that the Club should be very proud of. More info will be made available soon.

On Thursday the 24th of November, we have our Synchrotron visit. 15 members have committed to attend but please let me know if you cannot make this date so that I can offer the positions to other members. I will be providing more information to the attending members soon.

In September, I will be looking for someone to chair and take the minutes for the General Meeting as I will be interstate visiting family. I'm sure one or two of you will take this task on and help me out.

Bruce Williams has returned from his overseas trip and will be back in action for the Prac nights. I'm sure the Club values Bruce's contribution to the Prac nights and will come along to show their appreciation for Bruce's effort. Bruce will be looking to discuss and start the next construction project.

Kind regards,
Bruno Tonizzo VK3BFT,
President GGREC Inc.

From The Editor

This month I've being playing with all sorts, from solar garden lights, though to pulling my car's passenger door apart – and creating a How-to video in the process.

Ages ago I was handed a garden solar light, a fairly large unit, kind of like the gas powered ones once seen. It didn't take me long to round up several other examples and start diving into them. I took several pictures and hopefully I can use this as an article in the future.

Then last weekend, we were all ready to go to church, when I went to open the passenger side door for Marianna, trouble was as I pulling on the handle, she did likewise from the outside, the mechanism didn't like that one bit, with the result that the inside handle stayed out and it was not possible to shut, let alone lock the door. Pushing the handle back in was kind of pointless as it connects to the lock mechanism by a cable that is unable to do anything other than pull. In the end I parked the car extremely close to my caravan so that it was near impossible for anyone to access the open door, problem was the car's central locking system was too smart for its own good, and would not let me lock the car. The central locker locked all the doors, then realising one was open, promptly unlocked them all. I ended up legging it to church (I was on for running the PA and slides) with Marianna staying home as her legs were no way up for a brisk 10 minute walk.

Later on I guessed that I could do some shenanigans with the car fuse box, pulling the locking fuse just as it locked, so it would be incapable of the following unlock, but I never ended up trying that one out.

My other line of thought has been around my HiFi system, and getting an oddball amp up and running along with a music player to run a rather old (60's) Philips HiFi speaker. Back then valves ruled, and how they interacted with speakers was quite a bit different to the modern way of doing things where the output impedance is incredibly low, meaning great damping of the speaker is obtained, as opposed to a simple single ended valve amp that probably provided near zero damping. Now this surely has to affect the sound.

I have a little single ended valve stereo amp that I intend to try and characterise, then see if my wacky idea for an amp can replicate it. The amp will be a single ended class A design, with the transistor loading up into an inductor. With valve amps the load is usually a transformer, however I remember reading about valve AM transmitters where they used a separate inductor to pass all the DC current, and only feeding AC (audio) into the transformer. Mind you I'm talking BIG transmitters whereas this amp will probably top out at 10W. So we'll see if there is any difference. I plan on having user controls to set the bias current – which on a class A determines the final output power, as well as a feedback pot, so this could prove interesting.

An open chassis design with an industrial computer board hanging off the end to provide network audio – will it work, who knows, will it smoke, probably, do I care, not really.

Paul VK3TGX

A Case of 'ANT'enuation

Repair of VK3RDD repeater - June / July 2022

(Bruno VK3BFT / Rob VK3BRS / Albert VK3BQO) - article by Albert

Several reports hinted that the TX had a problem and another regarding the receiver.

This repeater's controller has error capturing software built in that can be read remotely. The error code showed low TX power at the antenna. A second code showed it was transmitting into a higher than normal SWR or for the engineers, a low return loss.

Bruno and I spent a couple of hours at the repeater site to determine what needed to be done to get the repeater back to spec. After the obligatory cup of coffee to plan the attack, we opened the repeater cabinet.

We found that the transmitter output was a mere 4 watts (usually 42) which is why the first error code was showing. It was decided to remove all the equipment and return it to the BQO test bench for a full work over but on disconnecting the first cable, a flock of ants (well what else is a bunch of ants called - maybe a colony or an army) showed that they had made a home in the repeater equipment and were coming out of everywhere to protest being disturbed. Were they the cause of our problems? See pics below. Read on.

Ants objecting to being disturbed

The next hour or so was spent coercing the little beggars out of the equipment so I could load it into the car to take home. The cabinet was left looking like a war zone after a healthy dose of surface spray was expelled into every nook and cranny.

The story continued on the test bench where a few stragglers needed to be moved on.

Upon setting up of the transmitter and its external P.A. stage, full output power was measured being 42 watts, so were ants chewing up the available power at site? Hmm.

A prolonged test of the TX showed no further problems so it was put aside.

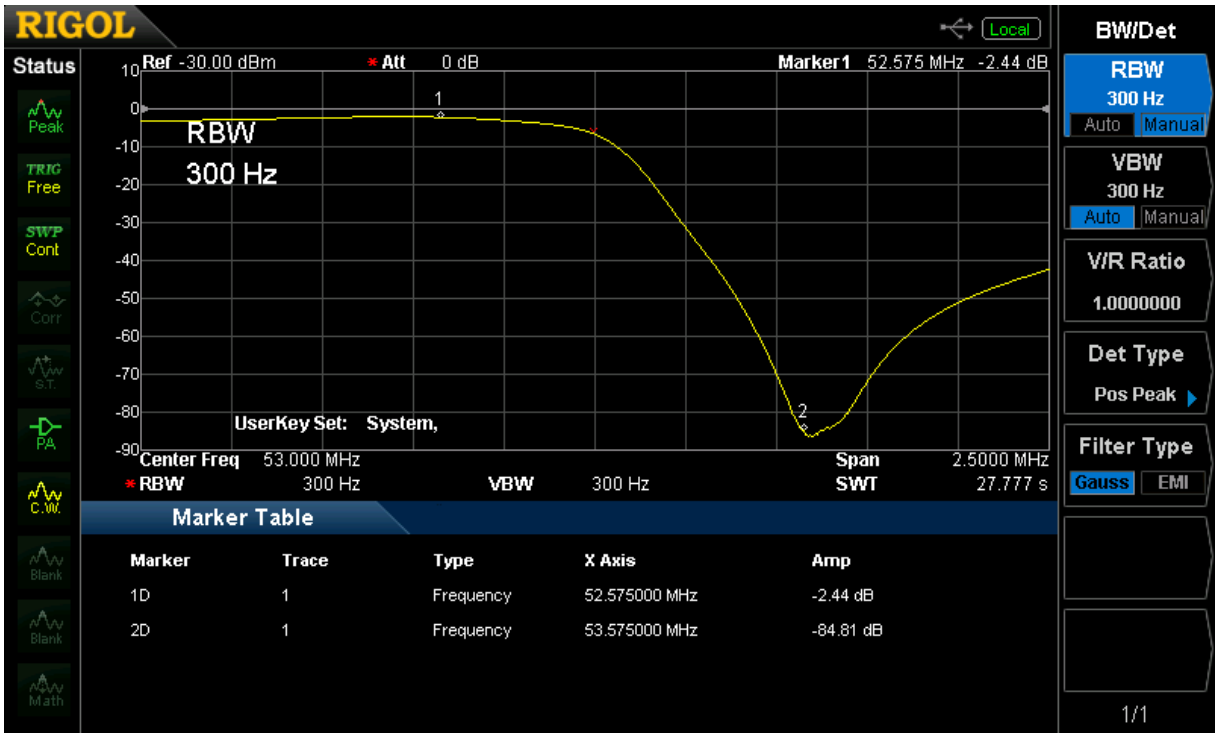
The transmitter output passes to the antenna via a set of cavities (See pic below) as does the receiver and it appeared there was a problem with the tuning of these.

Cavity tuning is not an easy task and is pretty much only done if you have special equipment which includes a spectrum analyser (spec. an). Rob and I started this job one morning and finished the job in the middle of the afternoon. Read on to see why.

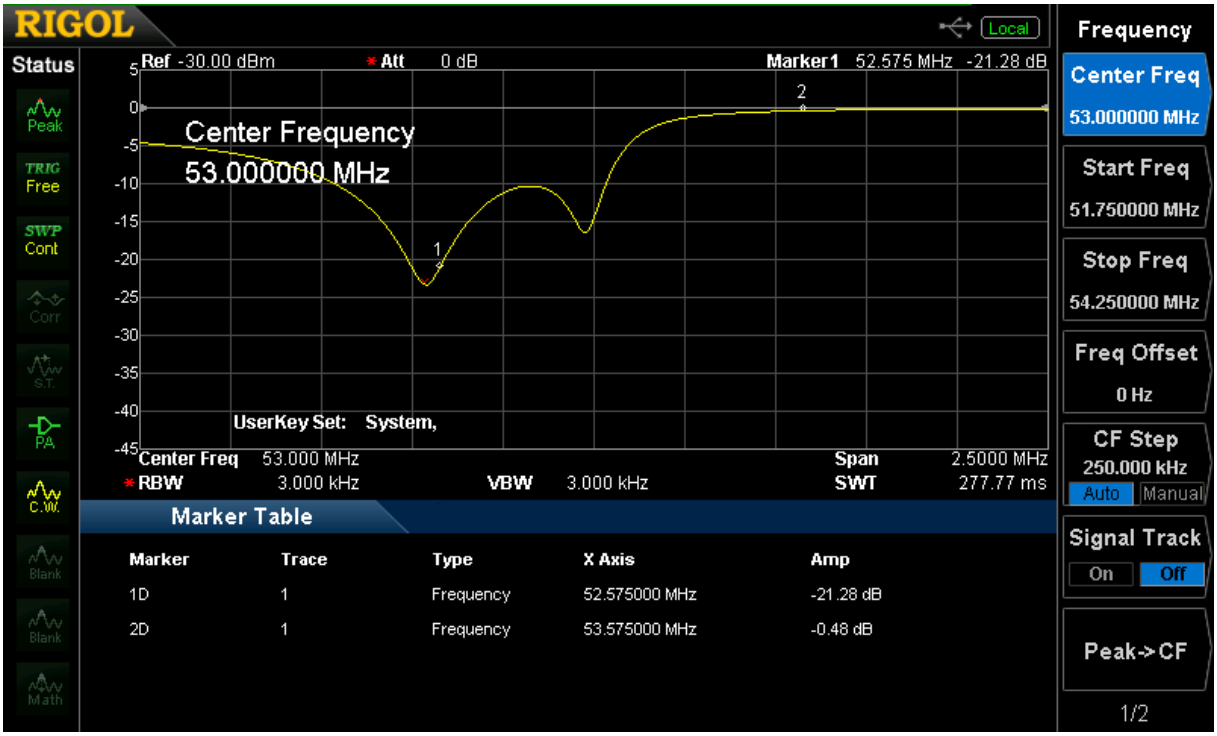
After connecting the test setup, it was shown there was indeed a serious problem and bumping or tapping the cavities caused the spec. an. trace to jump wildly. Removing the bottom cover of the cavity unit showed some rather dicky soldering (see weird pic below) and it was found to be filter number 4 that had a connection problem. Strangely enough, this filter is on the RX side but does interact with the TX side as well. After some time was spent repairing the obvious and checking other connections, it was decided to better leave the existing alone lest we cause more problems than we fix.

Close up of the bad solder joint

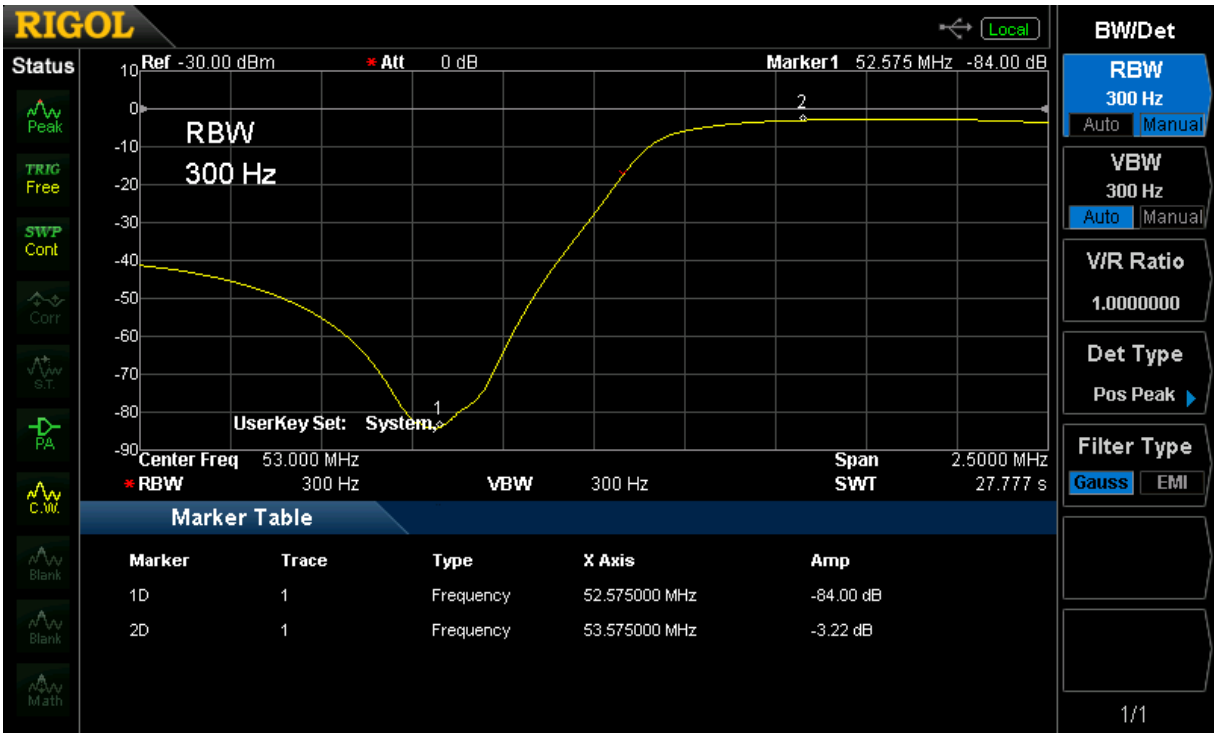
Back on the tune up bench showed better but not best performance and so we set about touching up the tuning. Eventually the figures below were obtained which were within the manufacturer's specs.



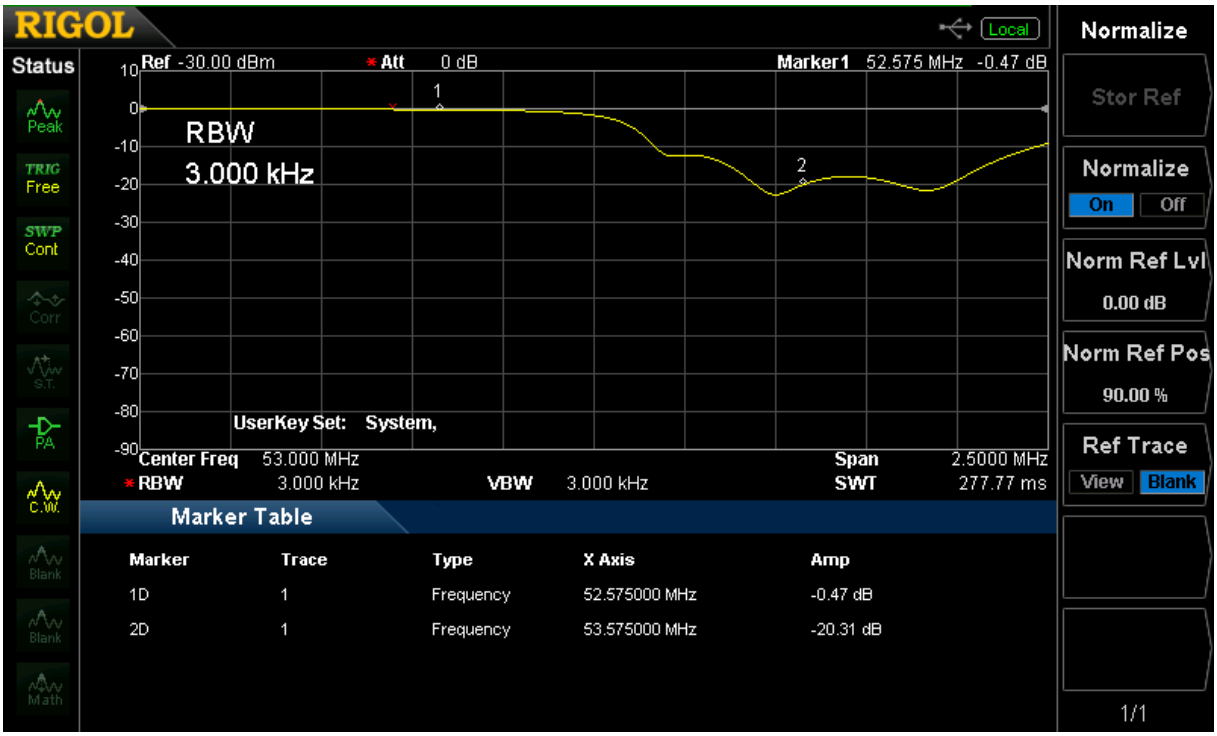
RX pass / reject



RX return loss



TX pass / reject



TX return loss

With the complete repeater set up on the bench, all worked ok even though access to it was limited to locals due to my home being in an RF hole and the high ambient noise level masking received signals. Full testing will have to wait until time allows a re-install at site.

Part II

Finally, time allowed for a re install of the gear. Rob VK3BRS and myself arranged to meet on site one Saturday. Firstly a cleanup of the dead ants took place and the cabinet lost its appearance of an ant farm. It took less than an hour to complete the install with all working as it should except for what sounded like possible RF feedback causing noise on the transmitted audio. Several suspicions were discounted, however the likelihood of RF getting onto the power supply low voltage rail seemed a good prospect. Problem was that nothing had changed from the original configuration (except for an ant or two), so what was different now. As we had not brought much in the way of test gear with us because it all tested fine on the bench, we resorted to anything that could be done while on site. We temporarily connected one of the Club's field kit batteries to the transmitter section and left the in-built power supply to run the receiver and controller parts of the repeater. Strangely enough, the problem disappeared. From this, we deduced that our suspicions may have been correct about the RF feedback. The cabinet power supply was removed and taken home to be put on the test bench.

Once home, the power supply was loaded up with a test dummy load and up to the point where the over current protection kicked in, it seemed to be working ok albeit with some ripple on the output which proved not to be caused by any failing components. Juts as an extra measure, several bypass capacitors were added to the output.

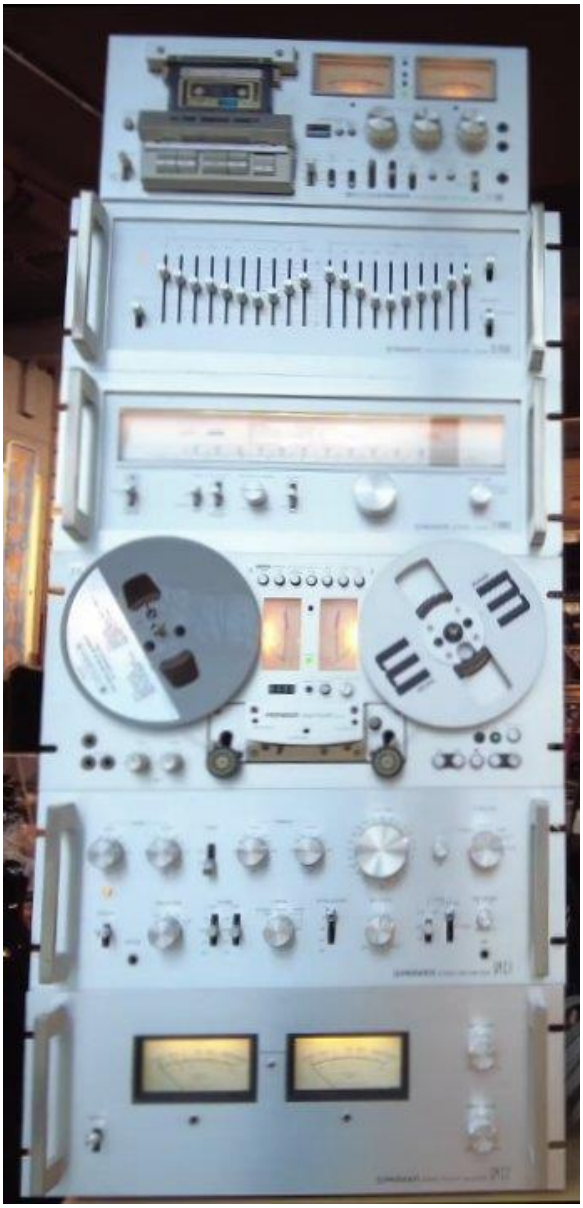
Several weeks later as time permitted, the power supply was re commissioned along with the repeater. Everything tested ok at this point so a success was claimed with no assurance that the problem would not re occur and according to users, the repeater is operating ok.

PS. I must acknowledge Mark VK3PKT for the title.

Club Merchandise

New Club cups, stubby holders, badges, and keyrings etc. Order forms available at the next meeting.
(Stubby holder sample only, final will have club logo etc)

Audio / Hi-Fi Fun



"Killer Pioneer System", courtesy of Sky-Fi Audio.

https://youtu.be/tP2pP8EE5oU

Now not exactly my stack – I didn't have a separate power & Pre-amp, however I'd have to add a CD player, and of course it's missing a turntable, not that I loved them – actually turntables, or rather vinyl records were my pet peeve, for it didn't matter what I did, they were never clean. Crackle pop, crackle pop.

These days if you go onto the HiFi forums and websites record washers/cleaners get mentioned quite a bit. 'Back then', the most I heard was some brave (stupid) sole tossing a record into the kitchen sink. Then there was the short lived fad of playing records wet, that was until one of the big players (Stanton?) publishing microscope images of totally trashed record grooves, courtesy of 'wet playing'. It seems that the liquid cannot get out of the way of the stylus quick enough, and is subsequently forced into the vinyl groove walls causing the vinyl to basically blow apart. Who would have ever thought that, that this tiny little needle with near zero weight rubbing against a water proof surface could do that.

Another device that was in my rack was a Sony Betamax HiFi VCR, yes a VCR – although the video part could be turned off for audio only recordings. Unlike a regular VCR, these record the audio using two FM carriers, no broadcast FM mux here, a separate carrier for both left and right audio. This gave a way better dynamic range than even my open reel recorder could provide. It was only bettered by the CD when it finally came out.

The only downside was tape stretch, as the helical scan audio track would be now not quite in alignment, resulting in a 50Hz buzz entering the sound. This also could be a problem with tapes made on other machines – as in purchased recordings. However as I was making my own recordings this was not really an issue. How the VHS version performed I don't know, however I assume it was all but identical.

Whilst on the video bit, professional digital audio was originally recorded using video tape recorders, the digitized audio was turned into a picture of a lot of dots, kind of like a QR code, then fitted with standard video sync pulses etc., so the video recorder had no idea and just recorded it as any other picture. One oddity, as this was originally done in the US, where their video runs at 60Hz with 525 lines, when all the mathematics was over an audio sample rate of 48.1KHz, was found as the best fit, unlike CD audio at 44.1 KHz. For most of the history of music, the only way to record it was on tape. Direct to disc did exist, however tape ruled. With digital music the bandwidth of the information needing to be recorded far exceeded the abilities of even pro tape recorders, the only thing with the bandwidth was a video recorder, and as these were plentiful, a logical solution.

Now don't get me wrong, I no longer have a big rack of HiFi, it now mostly lives in a cabinet under my TV, For music only, all I really need is a decent amplifier and a digital music player. I am currently using Volumio https://volumio.com/en/ running on a Raspberry Pi 3b with an add on DAC, here there are many choices, all controlled from a web browser (phone, PC, tablet etc.)

These days, for many, most audio seems to come from a Bluetooth speaker linked up to a mobile phone etc. (Yuk)

Compared to that Pioneer stack, this kind of does not do it for me, Yes this speaker is an awfully small example, however when they get bigger, there is usually not much extra on offer, just more volume and probably a bunch of flashing lights to try and bling it up. This pic from Google, from among a great pile that all looked very similar, just the brand names change. Admittedly a JBL will probably do better, but not true Hi-Fi…

If you head into a store like JB Hi-Fi where once they sold Hi-Fi you will be greatly disappointed, it's kind of being reduced to a shelf or two of these bluetooth speakers, with one or two larger floor standing examples. Otherwise the shop is now full of other 'junk' like kettles & washing machines etc. I used to go in there for a looksee, now the place is so depressing it's not funny. Yes there are other shops about, however they mostly cater to the Hi-Fi elite/audiophiles and the prices truly reflect it, most items start at $1500, so a system will set you back 5K plus – now way out of my budget. So now its second hand, or 'vintage' equipment for me, Here you will find quite a wide range from this Pioneer SA - 508 that sounds really, nice to some awful abominations that maybe indicate why Hi-Fi died. I picked up a 'receiver' at a hamfest (combo amp & tuner) that sounded truly bad; it was long ago stripped and junked so I cannot quote a brand or model number.

There is one fairly easy solution, keep the box and add new innards. (well the PA stages that is)

Two of these $65 K5158 hummingbird kits from Altronics should bring you some joy, they put out 60W into an 8 ohm speaker (100W into 4 ohm) and have a specified distortion of below 0.008 % at 1KHz, this is surly good enough to ward off all those el-cheapo class D amps on offer through the web.

I saw one the other day, 1200 to 2000 W a channel, yet it can run off 12V, only needing 5A! Someone sure failed maths.

This part is kind of easy, however speakers are a real problem, whilst Altronics and Jaycar sell drivers, full on speakers are all but zero. DJcity is one retail possibility, however I'd be looking higher – get onto Google for 'HiFi speaker', you probably want to spend two to three times as much as on your amp, Dali, Kef, JBL etc. Or if your adventures, build (or repair) your own, maybe try 'http://www.theloudspeakerkit.com/'.

Paul VK3TGX

Blast From The Past

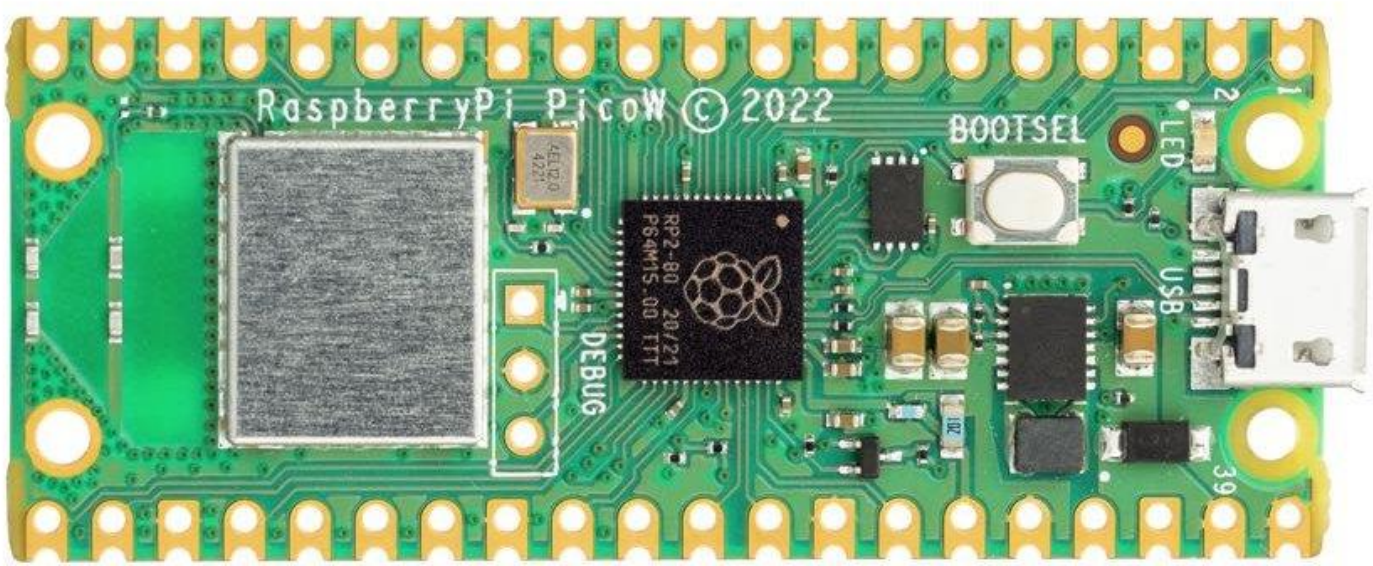
In 1982 the club was providing support communications for Horse Endurance Rides. This picture was taken in the hills to the North-East of Alexandra where we were setting up a portable 2M repeater for the event. The antenna diplexer can be seen attached to an interior panel which was coupled to a modified Philips 828 transceiver.

From Left to Right the picture shows Dianne VK3JDI, Ian VK3BUF, (Crouched down) Albert VK3BQO (standing) Ben Loois

At this time horse and rider movements were called in to a central location via a series of key checkpoints through the mountains. Results were compiled and directed to a Siemens 100 teleprinter at the event headquarters via a VHF RTTY link

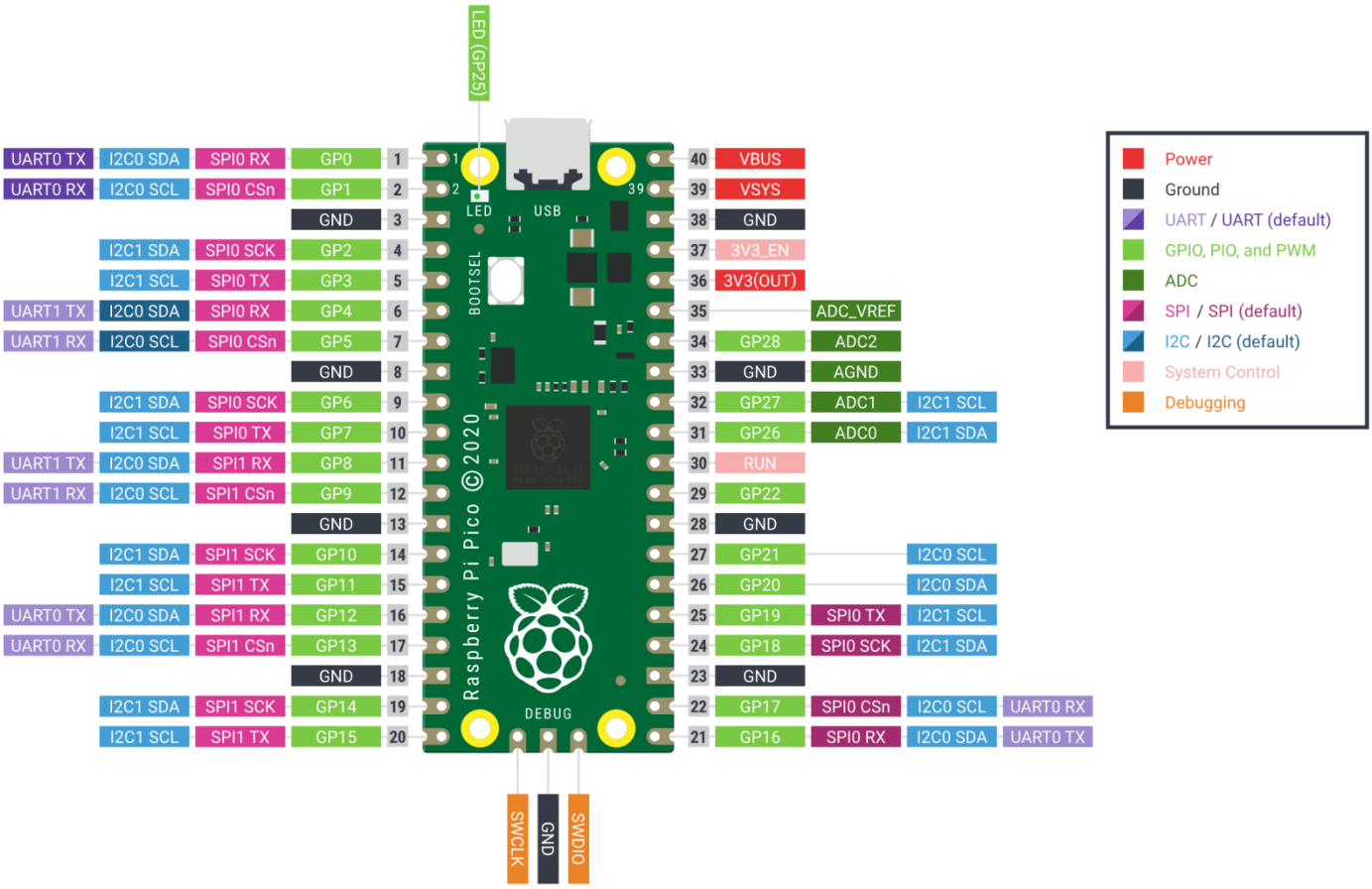
Ian VK3BUF

Raspberry Pi Pico W



A new processor for your projects, The Raspberry Pi pico has a lot going for it compared to previous favourites like the Arduino Nano that I have used on many occasions.

These are available from local suppliers like 'Little Bird' (Pi Australia) for $9.90 for the WiFi version shown here, or $5.75 for the non WiFi version, all without having to bother with Chinese suppliers etc. (Yes Nano's are available locally, but at a greatly inflated price)



These feature a 32bit Dual core ARM Cortex M0+ processor running at 133MHz, they also have 26 I/O pins, and also have a 12bit analogue to digital converter,

So way more powerful and capable compared to an Arduino Uno.

However the bit that maybe gets you interested in these is you are NOT restricted to the one language as was kind of the case with an Arduino.

Whilst these can be used with the Arduino IDE (Integrated Development Environment) they can also be programmed in python.

Also with little to no effort, Basic is also available. These have been used to emulate a range of older systems, like a Commodore 64, BBC micro, etc. So if you knew how to write a program on an old C64 to control your antenna rotator, but using a C64 for that in your shack just didn't work for you, well now you can port it over to one of these and put it in a nice box more suitable for use in a radio shack.

In the July issue of silicon chip magazine, Geoff, the creator of the Maximite line of computers, ported his basic interpreter over to the pi pico, the code is available for free from his website.

Whilst there is a SC PCB available, however the $10 postage sucks for a $5 board, If enough members are interested, then maybe a bulk buy could solve that problem.

A basic version, without an SD card etc, could be done on vero board, as the pico can store your basic code internally, and be setup to auto launch it on power up.

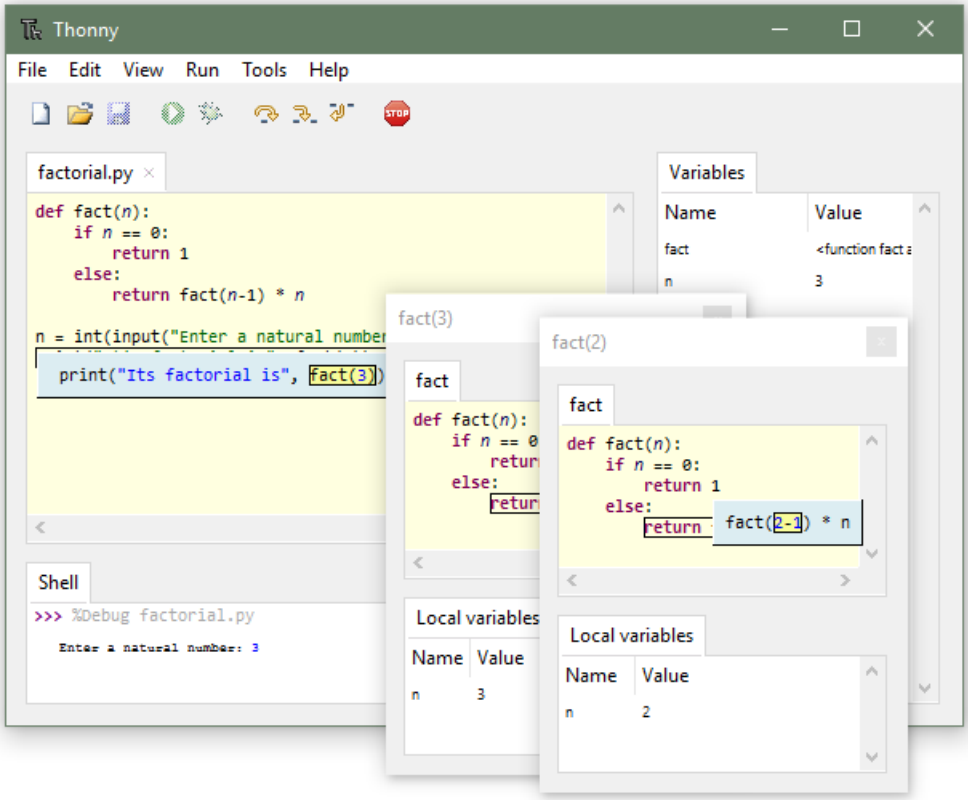
Hopefully it'll get updated to support the WiFi version.

https://geoffg.net/picomitevga.html

This project will output to a VGA monitor if needed, so maybe a replacement for the GGREC club's PC based door controller that is surely on its last legs. Being dual core, Geoff has one core dedicated to running your basic code, whilst the other core looks after the VGA signal generation.

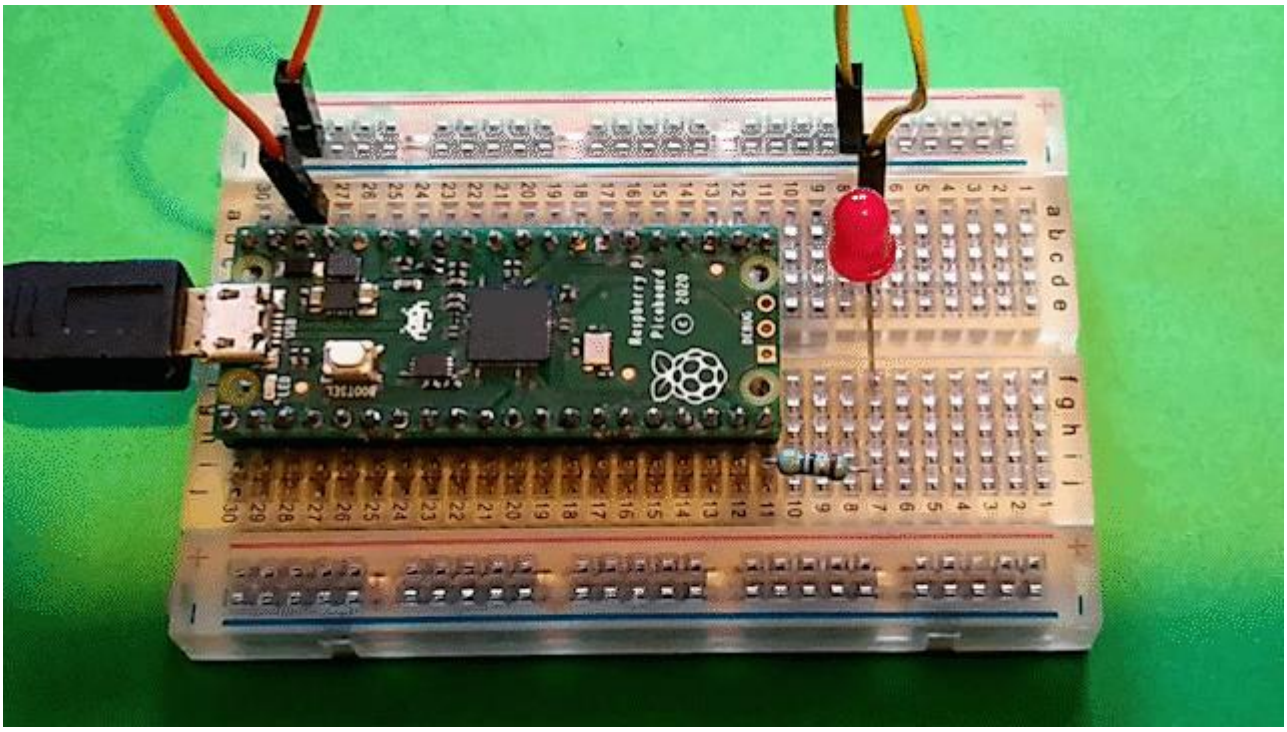
To program in Python, you can use the Phonny IDE

https://thonny.org/



Getting started with Raspberry Pi Pico

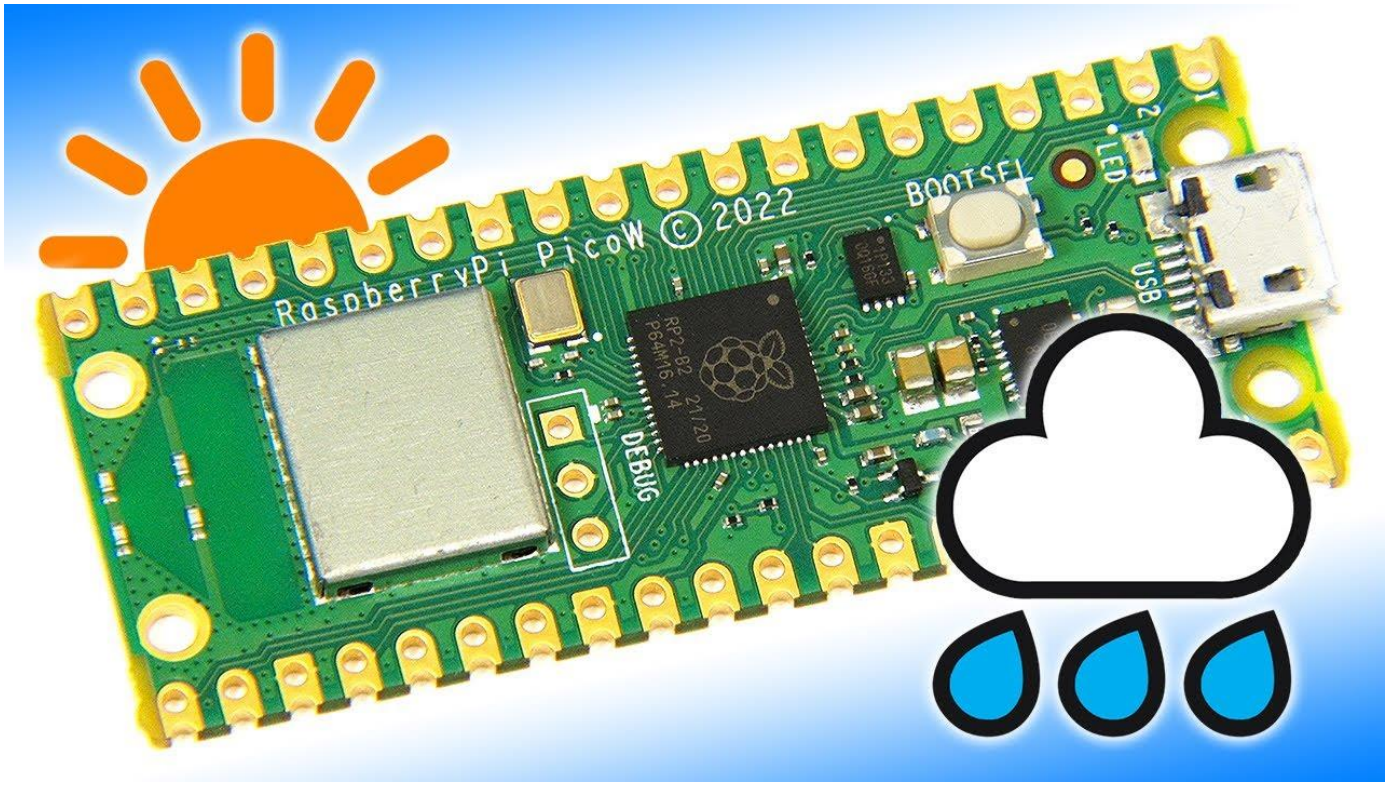
https://projects.raspberrypi.org/en/projects/getting-started-with-the-pico/1



So get you soldering iron out and start building.

Paul VK3TGX

Interesting YouTube Videos



Raspberry Pi Pico W: Wireless Weather Station
https://youtu.be/3q807OdvtH0

Is the BuddiStick Pro Really That Good??
https://youtu.be/7aNPYa_zE4Y

WIRELESS INSTITUTE OF AUSTRALIA

WIA Affiliated Club

The GGREC is an affiliated club of the WIA

We also give Thanks to

Jaycar Electronics

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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

President	Bruno Tonizzo	VK3BFT	General 3	Bruce Williams	VK3BRW
Admin Sec	vacant		Web Master	Mark Clohesy	VK3PKT
Treasurer	Klaus Illhardt	VK3IU	Magazine Editor	Paul Stubbs	VK3TGX
General 1	Yarn Onken	VK3NOV	Property Officer	'committee'	
General 2	Helmut Inhoven	VK3DHI	Assoc. Secretary	Bruno Tonizzo	VK3BFT

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)

Magazine Articles to editor@ggrec.org.au Cut off, 10th of the month
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