GATEWAY

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

April 2025

LoRa Radio Data Links.

Fence Solar.

GGREC AGM.

And More

WIA Affiliated Club

Cover photo, Spectrum Analyser night that turned into a triplexer evaluation session.
(If you have any good photos, please send them in)

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Event Queue

GGREC AGM THIS FRIDAY NIGHT
(One Week early because of Easter)

April:

4th.	7:30	Prac night
11th.	8:00	AGM 2025
12th.		IARU 100th Anniversary Centennial QSO Party

May:

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

July:

5th.	10:00	GGREC Hamfest Sale 2025 – see page 5

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

President's Report April 2025

Dear Members,

As another year comes to a close, I'd like to take a moment to reflect on our club's progress and look ahead to the future. Our **Annual General Meeting (AGM)** will be held this **Friday, April 11**, and I hope to see as many of you there as possible.

After much consideration, I have decided that, due to personal reasons and work commitments, I will not be able to stand for re-election as club president. While it has been a privilege to serve, my availability to contribute has been limited, and I believe the club deserves a leader who can dedicate the necessary time and energy.

This brings me to an important request: **We need your help to keep the club thriving.** The success of GGARC depends on members stepping forward to take on leadership roles. We must fill several key positions, including:
- **President**
- **Secretary** (we already have expressions of interest)
- **Treasurer** (we already have expressions of interest)
- **Two Committee Helpers**

If you've ever considered getting more involved, now is the perfect time. Serving as a **Committee Helper** is a great way to learn about the club's operations without an overwhelming commitment. Every contribution, big or small, makes a difference.

Reflecting on the Year
Despite challenges, we've had a reasonably successful year:
- **Financial stability:** Thanks to a welcome windfall, we avoided another year of losses.
- **Membership growth:** We've increased our numbers to **70 members**, strengthening our community.

Looking Ahead
- **Hamfest 2025:** Ian VK3BUF is doing a fantastic job organizing this event, but we'll need volunteers to ensure its success.
- **Your ideas matter:** If you have suggestions for club activities, events, or improvements, please email **committee@ggrec.org.au**.

A Final Appeal
A strong committee ensures a strong club. If you're willing to contribute your time and skills—whether as President, a committee member, or an event volunteer—your involvement will shape GGARC's future.

Thank you for your support over the past year. It's been an honor serving as your president, and I'm confident that with your help, the club will continue to grow and prosper.

--

President GGREC
Fred Reid [VK3FWR]
Gippsland Gate Radio & Electronics Club INC.
ABN 16 564 648 726
president@ggrec.org.au
Phone: 0407 289 777

From The Editor

For this month's odd thoughts on projects, I got to thinking about adapting data I had formatted for a two line LCD display module to that of a 'regular' TV type screen, not that hard, however what to put on the rest of the screen – TV test pattern?, nah.

How about some inspiration from old movies etc. In this case I kept thinking of an old British Sci-Fi series, 'Space 1999', in this futuristic show, in the far off year of 1999, a base was setup on the moon, one of the uses they'd found for the moon was storage of nuclear waste.

However something went wrong and there was some weird reaction from all the old fissile material, a kind of explosion, not enough to damage the base, but enough to knock the moon out of its orbit of planet earth. So a British version of the US TV series 'Lost in space'.

Anyway, one of the things they had on this show was a lot of black and white screens primarily used as a 'video intercom', or comms system to all. When not in use they generally showed the image shown here. Often with the central 'Moonbase Alpha' bit replaced with status and time etc. So how about I use that to fill the rest of my screen – and bring back some childhood memories…...

So this ↑ ends up looking like this? →

I wondered as a kid, how they could survive as all their screens would have this burned into them….

Here is another one from the movies – this time it's from the Bond 007 movie, Tomorrow never dies. I thought it would be a nice gadget to have, however close scrutiny of the movie shows it always increasing, never a pattern I could copy/replicate that would give a replica a sense of what was seen in the movie, so no real connection. Oh well I'll just keep looking for something that tickles my fancy.

Paul VK3TGX

GGREC HAMFEST SALE 2025

On **Saturday, July 5** the Gippsland Gate Radio & Electronics Club will be hosting a Hamfest sale . the venue is at the **Longwarry Community Hall** at 14 Kennedy St. Longwarry, approx 60km East of Dandenong, Vic. The venue is easy to find. It is just 3 km South of the freeway interchange, 150 metres South of the Longwarry train station and level crossing.

Doors open at 10:00 am for buyers. Entry fee is $7 Doors open at 8:30 for stall holders. Fees are $18 per table. must be paid for in advance of the event via EFT. A maximum of 30 tables are available. Table hire includes entry for two persons. EFT use BSB 633000 Account 146016746 Bookings are not confirmed until a booking number has been issued by the booking coordinator. No trading before 10:00 am please.

Direct enquiries to Ian Jackson VK3BUF via: hamfest@ggrec.org.au or call 5644 3118

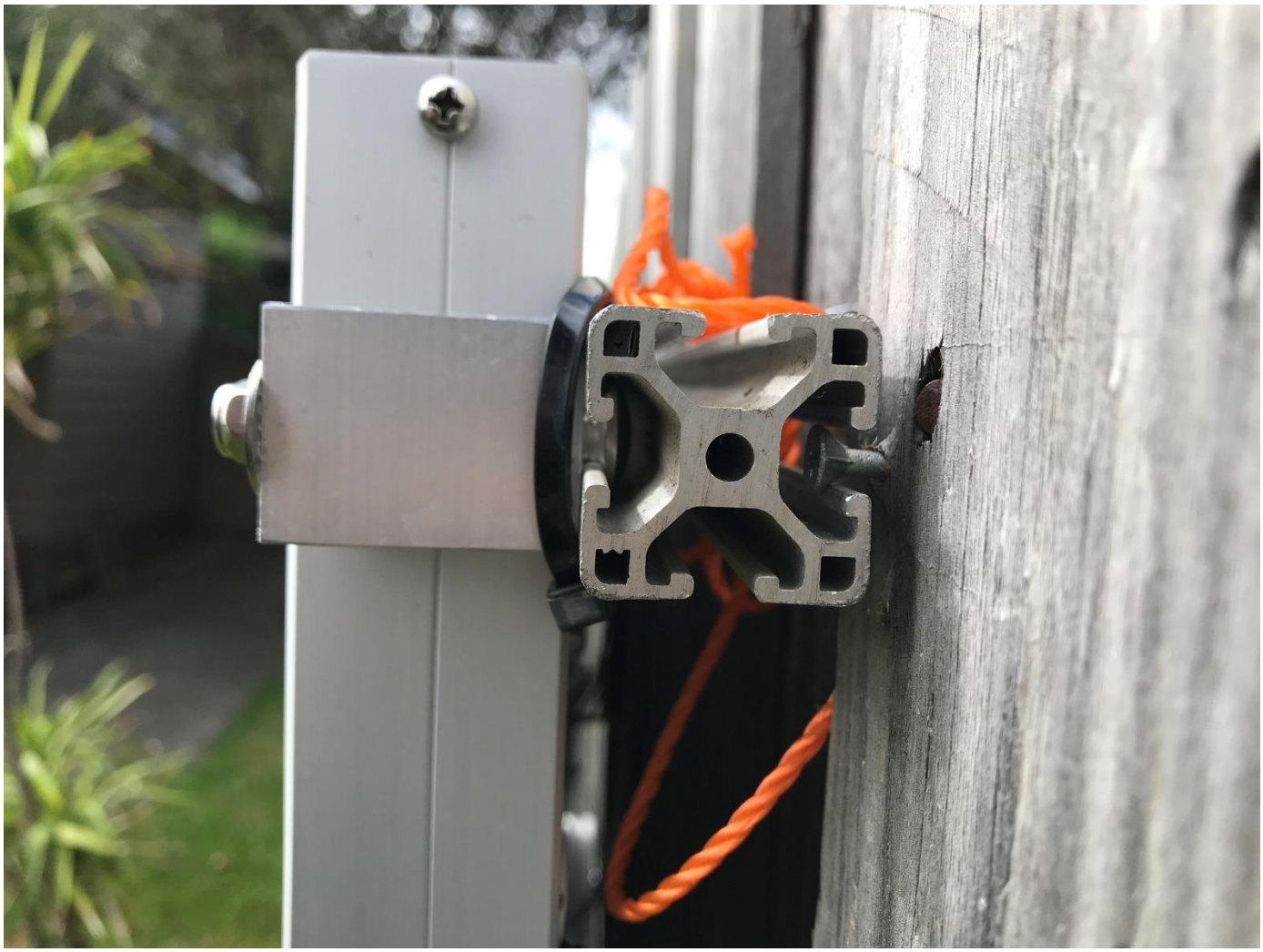
Fence Solar

On YouTube I stumbled across a video of a man with surplus solar panels, he'd just done an upgrade and was left with his old panels, so he decided to hang a few on his backyard fence.

Then I realised I had a few panels that have been sitting around for years – brand new in box awaiting installation. I had most of the bits, just a lack of time and tile roof mounts to make it a reality. I already have a 3KW system on my roof, I planned to park these ones off the end of those. These are 12V panels, that I was going to use to augment my 12V DC system.

Now hanging panels on your fence is not quite ideal, however it is otherwise wasted realestate, and on the plus side is a darn sight easier to work on, no slip and fall hazards here. Boy do those OHS (Occupation heath Standards) type get touchy when they see someone climb up a ladder, as evidenced by Molly Meldrum's rather public calamity when he fell whilst installing some Christmas lights quite a few years ago. So for many reasons a fence mount is way more convenient – especially if your install is kind of experimental like mine.

These BP panels (Do BP even doo solar anymore) are rated at 20W, so I should get 80W from them, right? Well not exactly, that's with them facing straight into the sun on a cloud free day with the panels not overly heated, any deviation from this and you'll pay the price. Even professionally installed panels on your roof will rarely achieve full output, there mounting angle will never be right, and in the middle of summer when we have the most sun, the panels will be getting quite hot (maybe I should pop a temp sensor on mine – now there is a project) which will reduce their output. In some quick and crude measurements it's currently more like 20W from the whole install – let's just wait for summer surely they'll do better.



To mound them I scrounged two lengths of T rail aluminium extrusion, into which I slid some stainless-steel coach bolts, these bolts extend just past the face of the panels where a washer and Nylock nut holds them in place. On the ends I had a bit of a problem as a bolt and washer does not like being only supported on one side, so I cut some dummy pieces from some aluminium bar to fill the void. The cable tie is to try end encourage that aluminium piece not to go flying. Yes I could have done better, but it worked on the day. I'm sure if I went to a shop that sells this T-bar, or solar panels I could get some readymade clips, however I didn't want to walk away and come back another day – I used what I had.

This is another advantage of a readily accessible fence mount, I can just walk up to it anytime and tweak things, I would never have done this if it was going up on the roof.

Initially I screwed some eyelets onto the fence and hung the assembly from them using the nylon rope you can see here, I bit tricky and needing the wife to hold the other end whilst I fiddled with my lack of knot tying prowess. Actually the whole assembly was not that heavy and I mostly just shirt fronted it against the fence, however that tactic started to fall apart when I tried to move to one end to tie the rope – so hence me yelling 'Honey – help'. Later on I ran some counter sunk screws into the fence and slid the T-rail onto them, way more secure.

However this a WAY more safer than my escapades on my brothers colourbond roof with full size panels, it must have been getting a tad late in the arvo as his roof stated getting exceedingly slippery. At one point I had a panel in one hand and my other arm wrapped around the mounting rail. I had to let go of the rail and reposition my hand so I could lower the panel into place, trouble was the rail was really the only thing stopping me from sliding off the edge of the roof – so I went for a lightning quick reposition – it must have been quick enough as I'm here telling the story. (She'll be right mate)

Now for the cabling, I wanted to connect it to my garden shed where my backup batteries are installed. Now it would have been way easier if I had the backside of the fence, I could just run it along the rail – but I didn't, so I either had to run it along the face of the fence, or get out the shovel and run a trench along the fence line, there was no way it could just sit on the ground as it would not last very long when it was time to cut the grass, if my line trimmer didn't get it the mower surely would.

I ran two screws into the fence and ran a length of wire rope between them, then lashed the cable to them, this way all the tension is on the wire rope, not the electrical cable.

In my odds and sods I had a roll of genuine NEC 'Solar cable', perfect, that should really enhance the performance, surely….

Apart from a good amount of copper it had an exceedingly good outer jacket, obviously designed for outdoor exposure, perfect.

Pity it came as two 7 meter lengths, rather than one 14M length.

The other option was garden light cable, when this stuff first came out it was quite good, however looking at a newer length in my garden shed I quickly realised that they had really optimised this stuff for maximum profit as it had been severely downgraded from what my memory of it was. I'd also run this stuff up my radio tower, however this new stuff – now kind of useless.

So head off to a solar supplier would be my advice these days.

Normally solar panels are wired in series, bringing the string voltage up to a few hundred volts, usually at a fairly heathy current of 10+ amps, so quite dangerous if you're not careful, especially in a fence install as everything is now quite accessible, especially if you have kids, so use the deigned for it supplies. On my system, series would have given me near 75VDC, enough to give you a surprise, however I've wired all mine in parallel, giving an open circuit voltage of a way safer 18V, but more like 13.5V under load.

With series connected panels you have to be very careful, as DC arcs are easily generated should you break a link whist the system is under load, you need switches rated for this type of work. On my rooftop system the shutdown instructions are to first isolate (turn off, disconnect) the 240V AC connecting to the inverter, this reduces the solar DC current to near zero, before flipping the DC isolators. Breaking a 10A AC feed is way easier and safer than a 480V DC line.

When I worked for Telstra we had these kind of large UPS's, they had 200V of lead acid battery in them that was then stepped up to 400V. One day one of the techs slipped with his multimeter probe starting a DC arc, it kept burning as it worked its way along a circuit board destroying everything in its path. So watch out, high power high voltage DC can be really nasty.

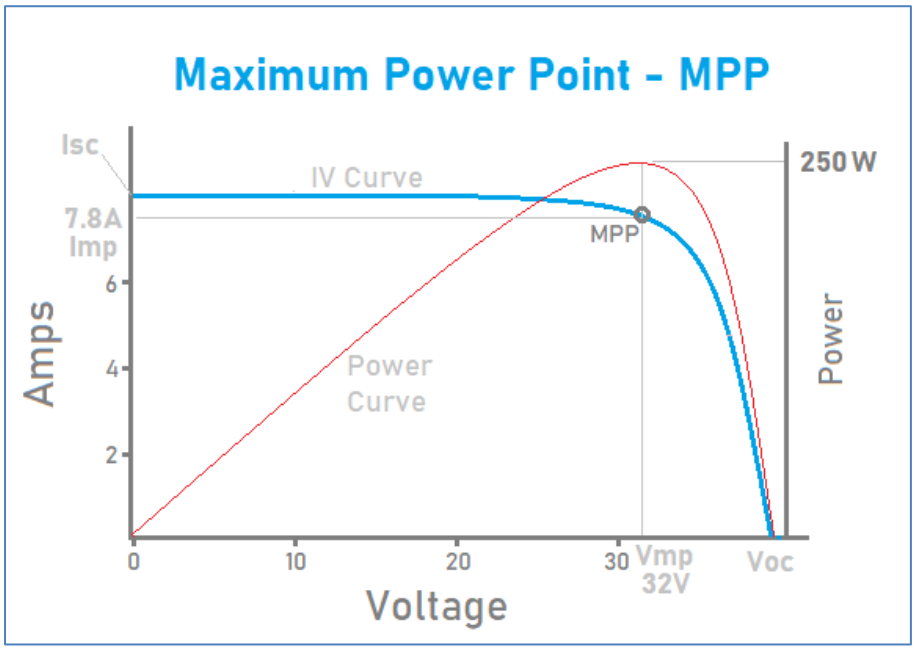
At the garden shed end I used a step drill and fitted a cable gland, not that I needed to keep stray water out of the shed, that cause was lost years ago, no, this is to protect the cable from the sharp edges of the sheet metal it's made of. I prefer to put the larger nut/gland end of the gland inside, as outside it's just asking for something to land on it and snap it off.

In the garden shed I have this old Telstra electrical box, I think it was originally a 50V power supply, however I put it in there ages ago, for possible future projects, well now it's housing an NEC solar regulator. I almost don't need one, probably a diode would be enough as the static DC load mostly exceeds the solar supply, however I have a Lithium Phosphate battery in there

and they get upset if taken over 14.8V, so the board will cut off at 14.2V, and also provides that diode isolation mentioned earlier. I have another board made by Solarex that was originally a low voltage cut off and alarm board that I rejigged for high voltage cutoff, almost perfect however no diode, so the old NEC won that race. (Neither are a perfect fit for my usage)

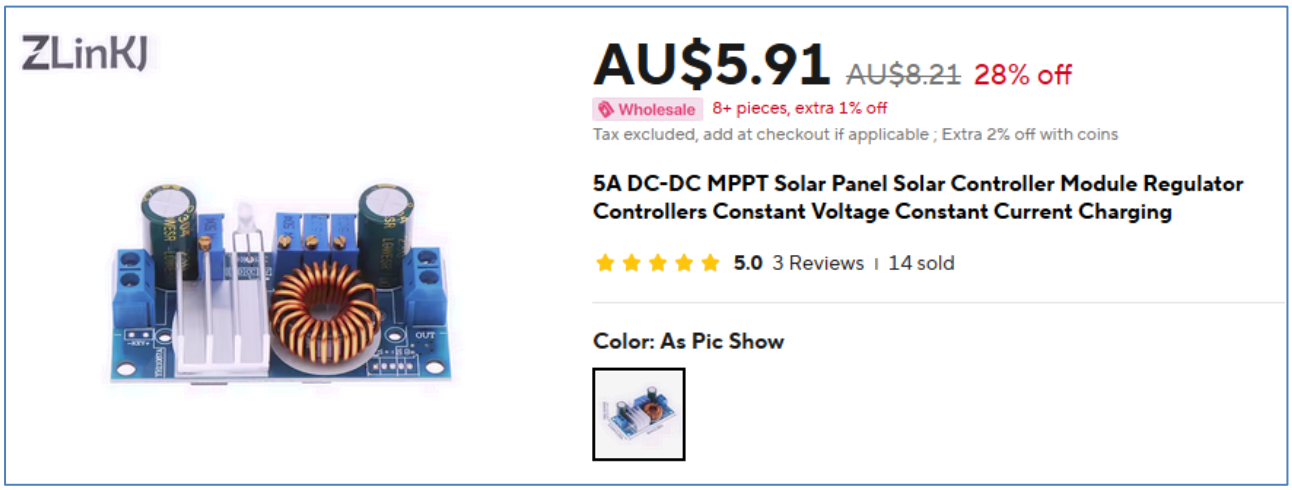
I had a look in Jaycar, they had a few low power regulators, but they were setup for lead acid batteries, as in the cut off too high – so no good for me. They do have a much more elaborate one, processor controlled where you can specify everything, however Its quite a bit more expensive and seems optimised for 20A strings, way above my league.

I did have a 'Maximum powerpoint tracker' regulator from a deceased estate that I was asked to build, I would have loved to give that a spin, but it's nowhere to be found, I must have given it back (they took forever to get back to me, I almost don't remember that bit).



With solar panels there is an optimal load that will get you the most out of a panel, kind of like the coaxial cable you use on your radio, although in that case you know the optimal load, most often its 50 ohms. However with solar panels it shifts about depending on the amount of sun light received.

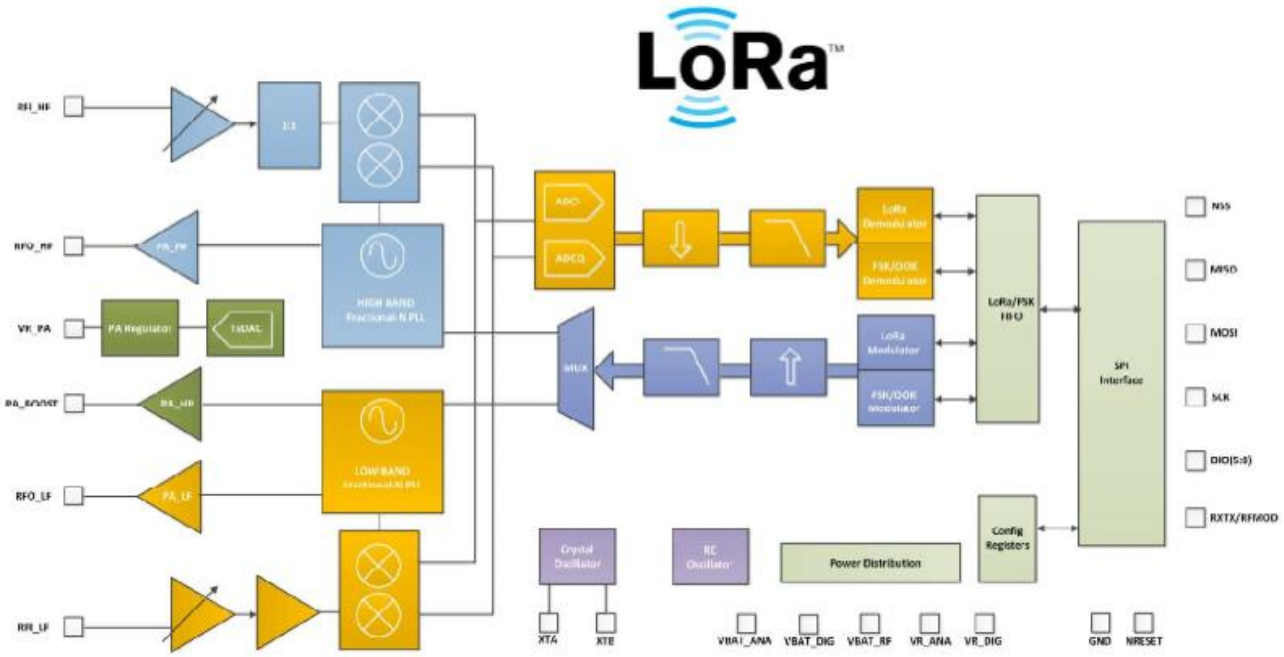
In good sunlight one of my panels gave me a touch over 18V with no load, and near an amp into a short circuit. Now solar panels are somewhat resistive, so if I draw any current that 18V will drop, so there is no way I could get 18V x 1A, or 18W. It's like that graph here, but obviously that one is for a much bigger panel. Voc for me is 18V and Isc is 1amp. Obviously there is a point in there where one gets the most, as per that red curve. An MPP tracker is usually an elaborate processor controlled switchmode supply that constantly tweaks its parameters and converts that optimal voltage to what you need – usually to charge a battery. Or there is this thing….



Maybe I should just order one of these from AliExpress. Certainly cheap enough.

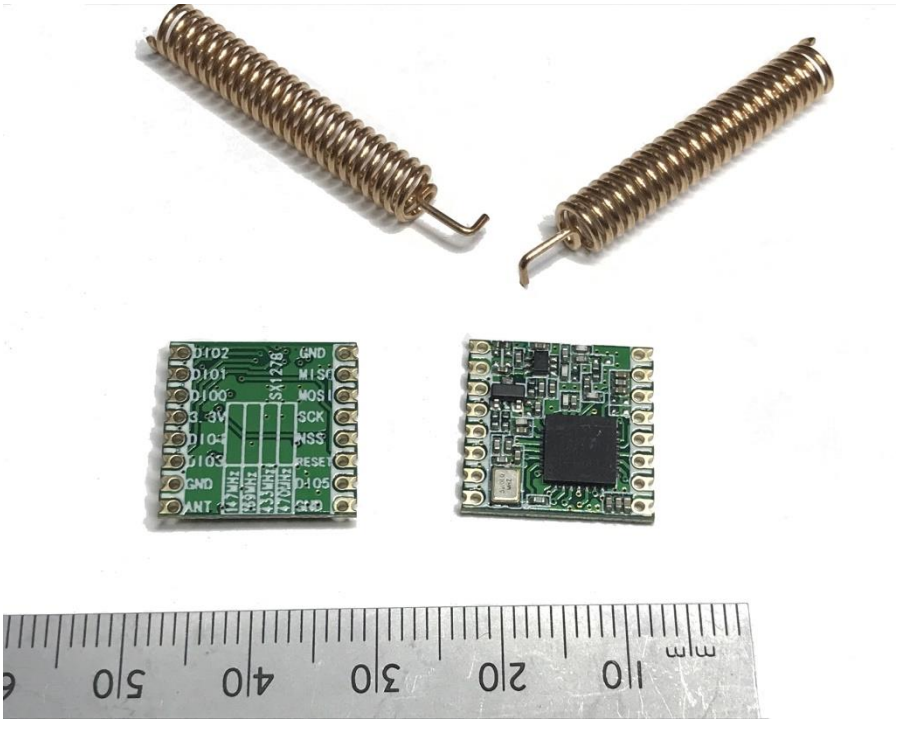
Paul VK3TGX

LoRa Radio Data Links



LoRa, or Long Range low powered radio links is one of the later radio systems out there, this one purportedly can give you a lot more range for a given power level, and the spread spectrum nature of it means way less interference with other systems, although I bet you would perceive an increase in the background noise.

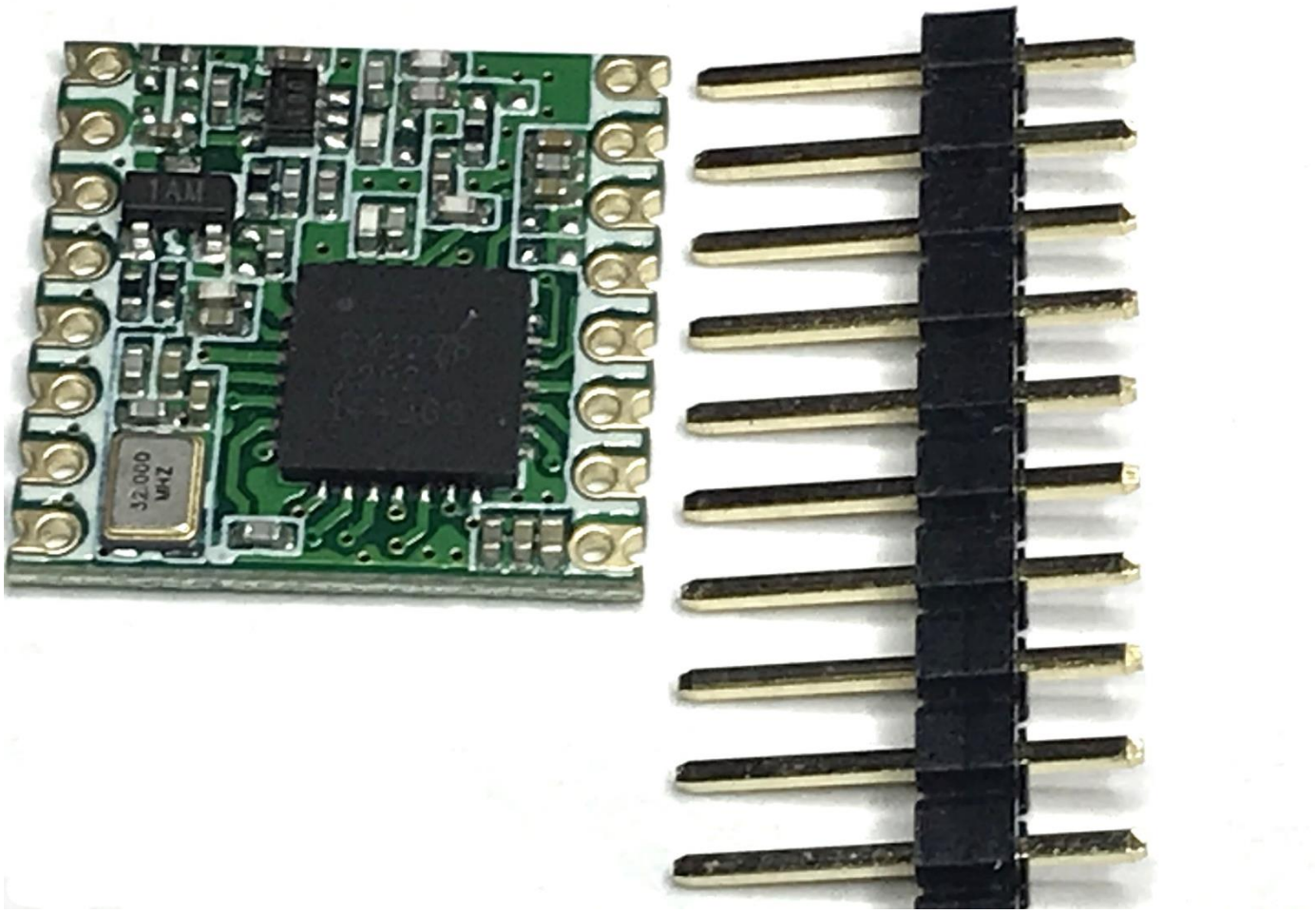
The modules I have here, courtesy of Robbie, are on the 433MHz LIPD band, however I suspect the spread spectrum nature of their emissions would keep them out of any 70cm repeater that's still on the old band plan. So these look like an excellent option for linking Arduino and simular projects together, the only downside I see is the maker of this particular board, Semtech quotes the LoRa implementation as being proprietary, so not compatible with other offerings in this field, Oh well.



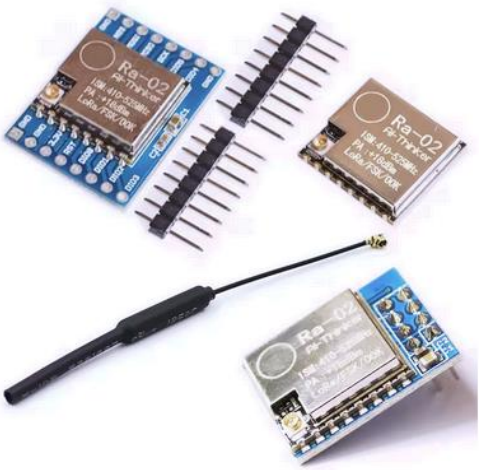
Robbie handed me two of these at the last club prac night, but with no paperwork, however printed on the back of the PCB is 'SX1278', and that's all you really need, well that and Google. I quickly found the data sheet, and a sample Arduino project, so they are really easy to get going in a sample test environment.

The little coil thingies are the antennas – so I wonder how a more serious antenna up a Nally tower would fair?

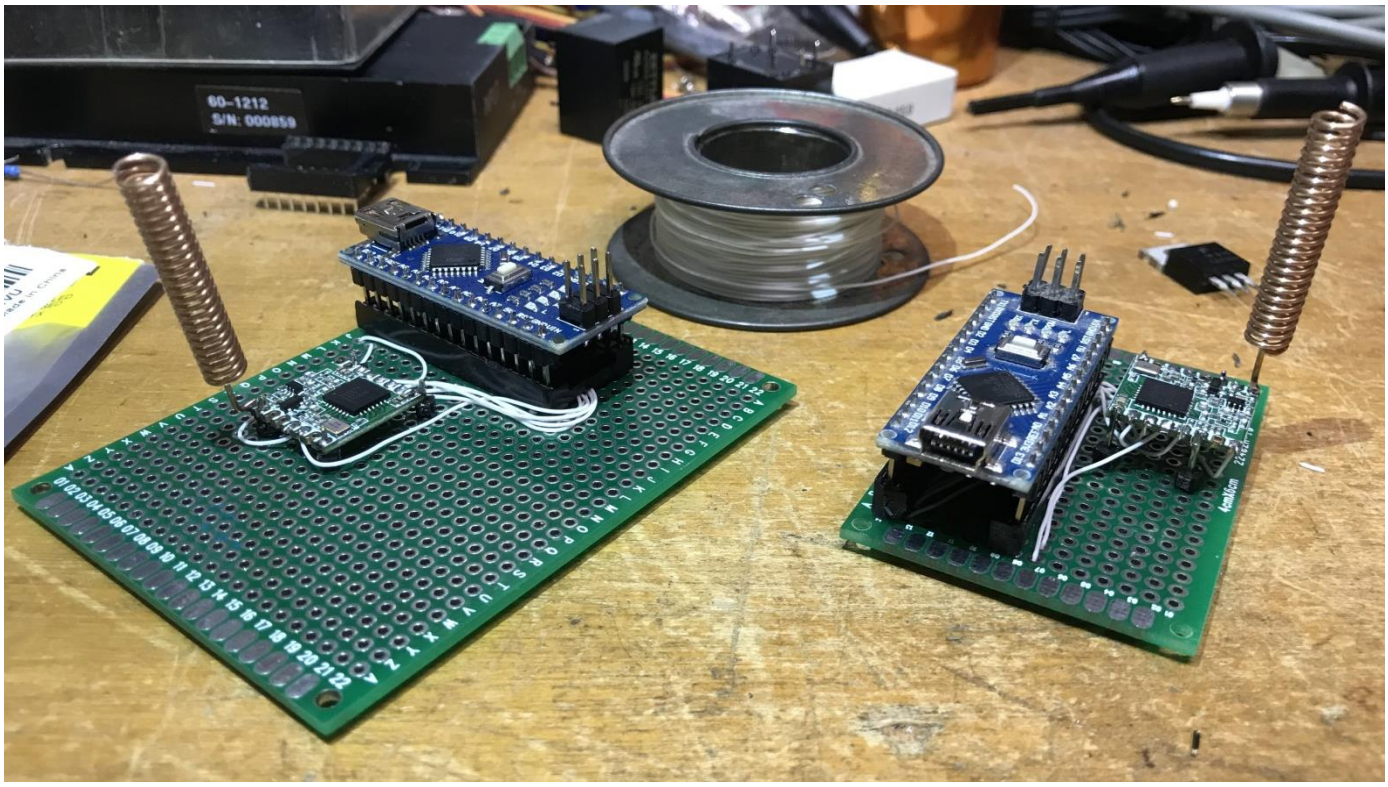
Is that even legal?



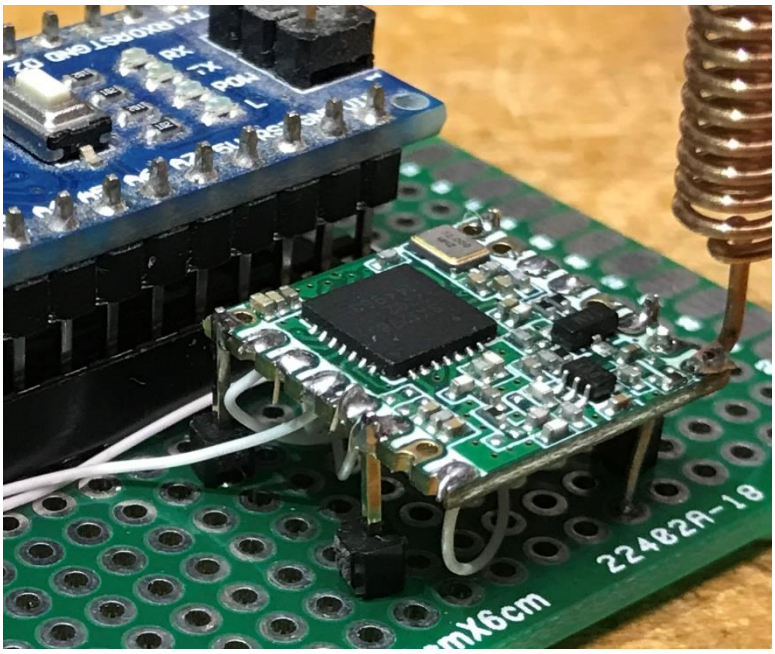
One problem that quickly stood out as I was shooting them, was their solder pads are not exactly 0.1 inch, so the regular proto-boards and pin headers are not going to work, I'm probably going to have to bodge them onto a 0.1 inch header etc., I'm sure there are adapter boards out there so convert 1mm pitch devices to the 0.1 inch format we are more accustomed to use, however just look at those tiny SMD caps and resistors, hopefully I won't need to touch them as I'm definitely not setup for that, the tip of my soldering iron will probably cover two of more of those SMD parts, making any soldering near impossible for me. Just look how close some of the pads I'm supposed to solder to are to the other parts on the board, I fear any solder bridges will be the end of one of these – back to AliExpress to order some more.



A look on the web says $2.48, normally $10.09 for these exact units, however there are a lot of larger variants that take the regular 0.1 inch header and also feature antenna connectors. The boards otherwise are quite a bit different with a large metal can covering all the parts – no idea if these work any better, however the .1 inch bit is a bit of a welcome relief.

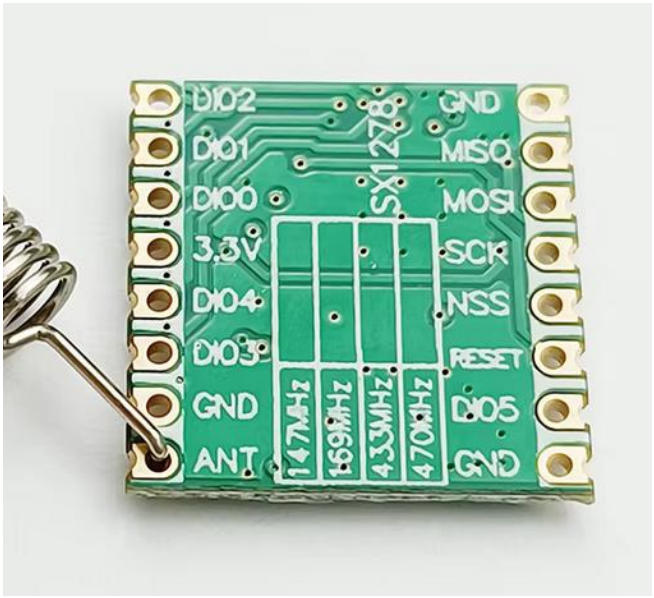


So here are my two builds to run the Arduino test code, I initially started with the larger board, but then successfully squeezed it onto the smaller one. I initially placed the Nano on the smaller board in the same axis as the larger one, darn, one pin short, but then tried rotating it 90 degrees. I normally place them the other way as the USB socket just hangs over the edge, ready for putting in a box with it poking out the back, placing it 90 degrees seas it set back a bit, not ready for a panel hole due to that row of fingers and mounting holes.



One, the smaller one will be the sender, with the larger as the receiver as that extra board real-estate should take an LCD screen. (Yes I could buy a small OLED, but it's just for testing, use what I have)

Placing a 'metric' board on an imperial (.1 inch) proto board is a pain, whilst the LoRa board is designed to lay flat, I cannot do that as all the donuts on the proto board will mess with the edge pads on the Semtech LoRa board. If I was using good old vero-board, that has a totally blank top with no plated through holes, no problems. I could have used some mounting tape, that would kind of solve the problem, but then I have to solder wires to it, and the solder/heat is going to have issues when it hits the underlying mounting tape (if nothing else, a pile of nasty burning odours) or if I trim the tape so it misses the solder pads, then I'm soldering awfully close – too close to the pads underneath, solder bridges anyone? The solder pads extend to castellated sides so they can be easily surface mounted if you have the right adapter. Actually a lot of the .1 inch proto board variants out there are just these mounted onto a custom adapter board, although they do have antenna sockets also.



The next *silly me* issue was once they were mounted I could not see the pin marking that are on the bottom of the board *D'oh*

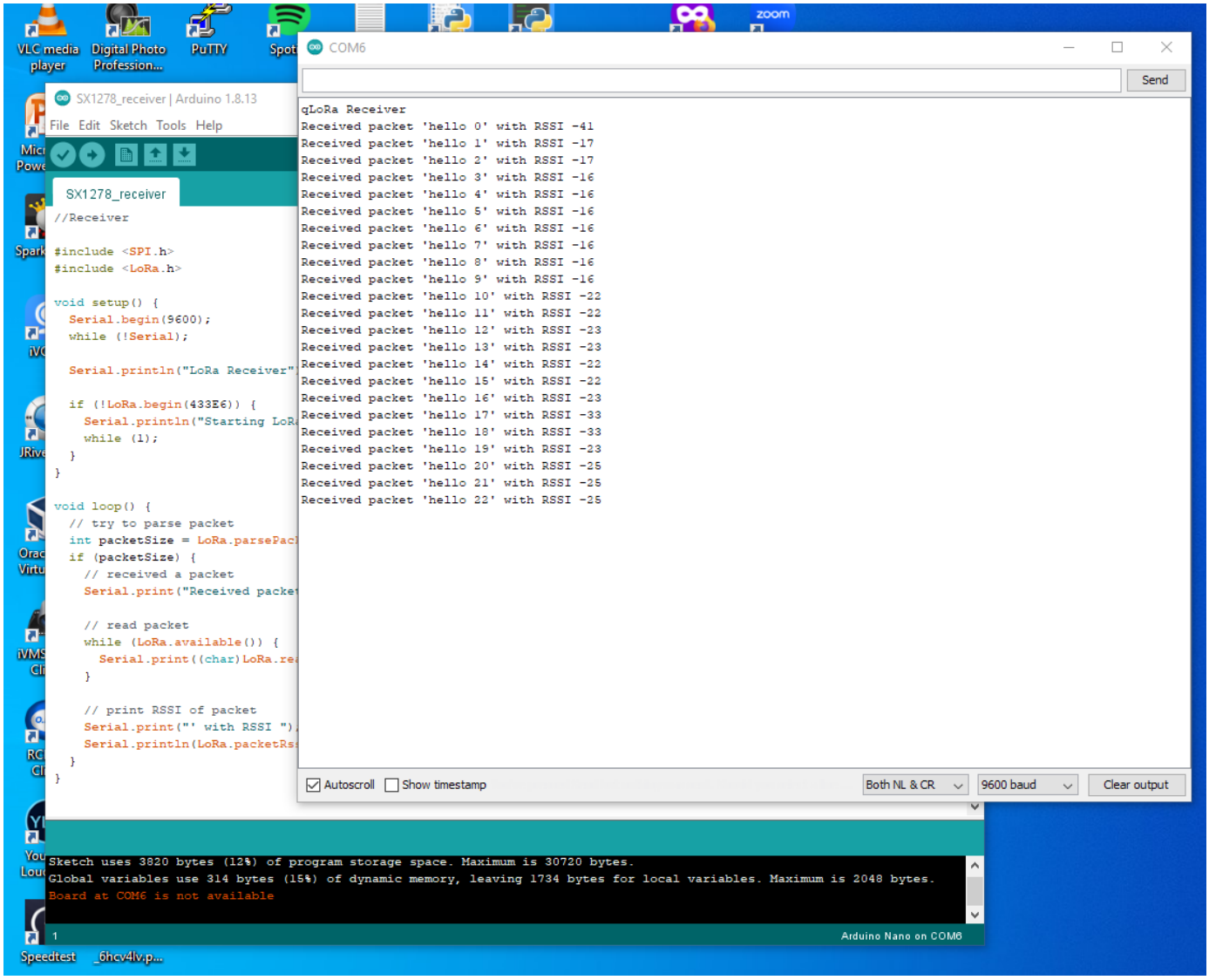
However hopping back onto AliExpress I soon found a suitable back of board picture.

So after wiring it all up and copying the test code from the Arduino site, then fighting the missing LoRa driver – that needed me to install Git on my PC (Yes, how have I coded without Git…)

Anyway it works – even after being warned about the lack or enough 3.3V amps from my Nano. The demo works – now for range testing..

Sample test code https://forum.arduino.cc/t/using-lora-with-arduino-nano/1266604

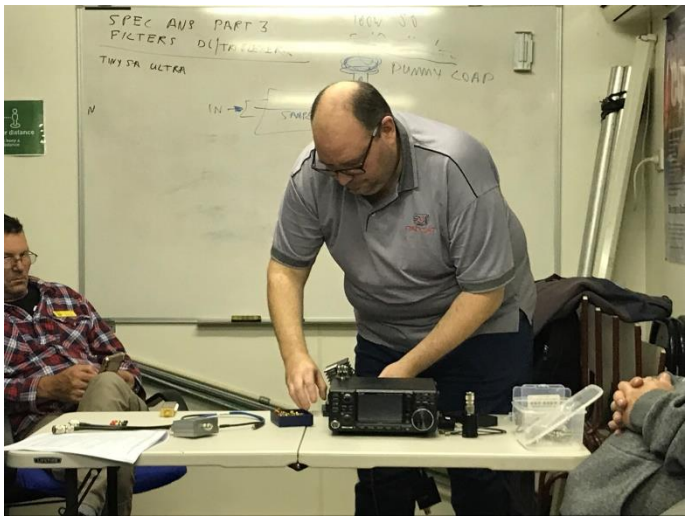
Git https://git-scm.com/downloads



That's it for now, time to get a display on my receiver & a decent 3.3V supply on the sender, then I can get into some tests – surely it'll beat my previous 2.4GHz boards.

Paul VK3TGX

Prac Night 4/04/2025



Spectrum Analyser night that turned into a triplexer evaluation session

Interesting YouTube Videos

Fixing a FM Radio Station Transmitter (Part 1)
https://youtu.be/rBFaw9igNkE

9 Massive HiFi Stereo Mistakes! We See It Every Day.
https://youtu.be/0XB9XVSqjXI

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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	Fred Reid	VK3FWR	General 3		
Admin Sec	Klaus Illhardt	VK3IU	Web Master	Mark Clohesy	VK3PKT
Treasurer	Bruce Williams	VK3BRW	Magazine Editor	Paul Stubbs	VK3TGX
General 1	Leigh Findlay	VK3BOW	Property Officer	'committee'	
General 2	Ian Jackson	VK3BUF	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
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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