



GATEWAY

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

October 2018



**Refurbishment of the Rotator
Scams, Scams, and more Scams
Variable Gain Pre-Amp
And More**

Contents.

- 3 – Presidents Report
- 5 – From The Editor – All smoke & smoke
- 6 – New Directions – The Refurbishment of the GGREC Shack Rotator
(Part 2 of “The Antenna that Wouldn’t Rotate” from last month)
- 10 – Scams, Scams, and more Scams
- 12 – Variable Gain Pre-Amp
- 16 – Club Information

Note: - club meeting minutes are on the club website

Event Queue

October:

- 19th General meeting – Guide hall
- 20th JOTA – See page 4
- 28th Ballarat Amateur Radio Group HamFest

November:

- 2nd Prac Night – Club rooms
- 9th Proposed caravan weekend – see top of page 4
- 16th General meeting – Guide hall
- 18th The Rosebud RadioFest

December:

Christmas Lunch? - TBA

PRESIDENTS REPORT OCTOBER 2018 – Bruce Williams VK3BRW

Hi everyone welcome to the October addition of the GGREC magazine.

Wireless Institute of Australia (WIA) Presentation

Last month we had a presentation given by Chris (VK3QB) on behalf of the Radio Amateur Society of Australia (RASA).

This month will be the WIA's turn to explain to GGREC members what the WIA has to offer and the role they play in amateur radio both in Australia and Internationally.

Although the WIA cannot be present in person, Aidan Mountford (VK4APM), one of the WIA's directors, is more than happy to take part in a video hookup instead.

JOTA / JOTI 2018

Just another quick reminder, to all members, that the club will again be taking part in JOTA. To be held on this Saturday 20th October 2018. Refer to the news article for further details

Tower Maintenance

Last month I reported that the HF Log Periodic beam antenna was lowered to the ground and the antenna Rotator, along with the masts main support bearing was removed for repair. This month I am pleased to announce that Ian (VK3BUF) has repaired any items requiring attention and with the help of a small band of dedicated members the Antenna was put back into service and is now fully functional again.

Refer to the latest refurbishment article (Part 2) in this month's magazine for further details.

Note: I have it on good authority, that not only has this pleased the members, who use such facilities, but it's also given the Cranbourne Corellas something to squawk about as well.

Club Badges

New club badges have now been ordered and should be available to those that ordered them, at this meeting.

Show & Tell

This month's theme is Handheld Transceivers and receivers. So make sure you bring yours along to the meeting. The idea being that you give a quick 2 to 3 minute talk on the pros and cons on what you own.

Wants & Needs

Don't forget to think about your wants and needs, prior to the meeting. This is your chance to see if other members can help you out with components, or gear you're having trouble locating, or finding at the right price.

Next Caravan Trip away

Last meeting we agreed to have a trip away and decided that Reeves Beach Longford (located on the 90 Mile Beach near the township of Yarram) would be the ideal location. It would now appear that the weekend starting the 9th November is shaping up as the best weekend to make it happen.

RLP Repeater

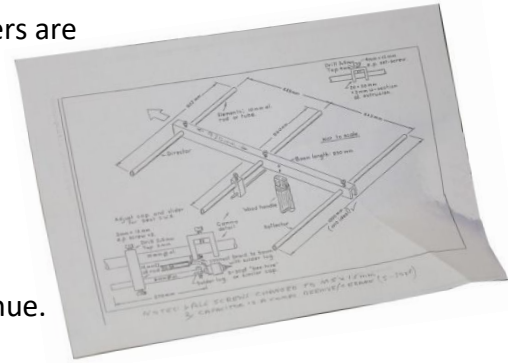
To fix, or replace it, that is the question? The committee has discussed this matter at length and a final decision will be announced at the meeting, as to which direction we go.

2 Meter Hand Held Yagi Antenna Project

At the last Prac night I outlined the virtues of this versatile antenna. That is, It is excellent for tracking down electrical interference (with the right receiver) can be used for 2M FM work and for general fox hunting.

On the night I gave a brief description on how the antenna works and gave out a dimensioned picture of the antenna itself. So far 10 members have shown a genuine interest in the project at a cost of \$20. The kits will be made available to those who have paid at the meeting. If others are also interested in the project, let me know on the night.

This project part of a theme, leading to a suitable interference receiver to build and a possible Fox Hunt in the near future.



Christmas Lunch

At the meeting I will be asking members for suggestions on a suitable venue. So please give it some thought.

Financials

As usual Chris, will give a brief description on how we stand financially.

Hope to see you all at the next GM to be held this Friday.

Regards and 73s

Bruce

JOTA / JOTI 2018

*** UPDATED ***

On the 20th October **(Yes this Saturday)** we are activating a JOTA station for the Cranbourne Guides and invited Guide and Scout groups. To make this day a success we are inviting members to come along and supervise activities like Fox Hunting, VHF/UHF JOTA contacts or HF Jota contacts. We are only required to assist for a few hours on the day so there will be plenty of time for a sausage sizzle for members that turn up to help on the day. A Working with children's card is not required (to be confirmed by the Guides) but if you have one bring it along.

You can find more details about JOTA / JOTI on the Internet if you want to read more about the event.

More details will be given at the general meeting this Friday.

From The Editor - All smoke & ... smoke

The saying is "It's all smoke and mirrors", well that's how I kind of view fibre-optic systems, you bounce the signal here and there (mirrors), and occasionally you have to use an attenuator to match a receiver (smoke). The other day I decided to get the Banggood audio player I ordered last month going. All was well until I connected it to the amplifier I was planning to pair it with, heaps of digital crud made up quite a proportion of the sound.

If I ran it alone off my bench supply and fed its audio into the shack Hi-Fi system, all was well, but when I tried to use a smaller 12V amplifier module all hell broke loose. It was almost like the scenario I mentioned in my variable gain preamp article elsewhere in this magazine, the only difference being that this one didn't care how loud it was playing, (as in from the effects of heavy amplifier supply currents)

The module had two power options, 12V, or via a micro-USB socket, 5V. If I powered the module from a USB power pack, calm was restored, but no-way did it want to share its power with that of the amplifier.

I was planning to run this wireless speaker project from a 7A 12V supply that I had a few of; I didn't really want to have two separate supplies. The power supply I had is fitted with a standard IEC power socket – the kind you find on most computer gear. I was going to mount the supply so that this socket was poking out the back panel, that way I would not have to run any 240V wiring, all the mains would be inside a commercial supply. Now if I was forced to fit a second supply – what two power cords – get real.

So I started to assume all the crud was coming out the 12V supply line and somehow ending up in the amplifier, because if I broke that single red wire, and ran it to a second power supply, all was well.

So I tried connecting a small choke/inductor in series with the 12V lead, this gave mixed results then a few moments later the music player module started smoking vigorously!

In the end its 7805M regulator had gone short input to output and my 25A shack supply was busy destroying (as in smoking up) the input protection diode, followed by some PCB track work. In the end I could make it work again from a 5V source, but the main chip was not happy, it was drawing near half an amp and getting very hot – as in over 80°C. All its functions worked, the sound was fine, but it was cooking and probably not long for this world. It must have borne the full brunt of my shack supply when that regulator failed, the only limiter was that protection diode. (The main chip is probably 3.3V)

On inspection I found a rather strange setup. Normally with a 3 terminal regulators, you use two capacitors mounted very close to the IC, one on the input, the other on the output, 10uF is usually about right. Even if you are running it from a 'conventional' power supply with a few thousand microfarads of filtering, you would still pop a cap in up close to the IC, as that big 5600uF etc. main filter cap is too far away to prevent your 78XX regulator from potentially being unstable and oscillating.

So what did I find, yes there was a 470uF cap on the regulators output, but no cap whatsoever on its input, apart from a reverse polarity diode, nothing.

So probably what happened was with that inductor present and no capacitor the 7805 has taken off oscillating. Now if you remember my article about making an inverter to run neon bulbs, then you will know these inductors can easily produce several hundred volts, way over what any 78 series regulator was ever designed to handle (The inductor I used was one left over from that neon supply, it worked well in that role).

So why no input cap – to save money? Well if that's the case then why did they include a reverse polarity diode? They would have been much better off skipping that diode and fitting a cap.

AAARRRGGGG.....



Paul VK3TGX

NEW DIRECTIONS – THE REFURBISHMENT OF THE GGREC SHACK ROTATOR

By Ian Jackson VK3BUF

This is the second part of an article on this topic. Last month Bruce VK3BRW reported on the process of getting the tower over and removing the suspect rotator. Here we examine the rotator in some detail and make it great again...

We had not been satisfied with this rotator for some years. It was a heavy-duty Emotor unit about 30 years old. The original control box was lost and a temporary one had been built about 6 years ago. It never pointed in a direction that matched the needle movement, the indicator used to jump around during rotation (a sign of a worn potentiometer up the top) and sometimes it would not work at all.

The Club has a large Log-Periodic array which is a serious antenna that really needs to be pointed at the target to work. With JOTA coming up soon, getting it going was important. We needed to know if the rotator was recoverable or junk. A similar replacement was priced at about \$1800. Not something we wanted to spend lightly.



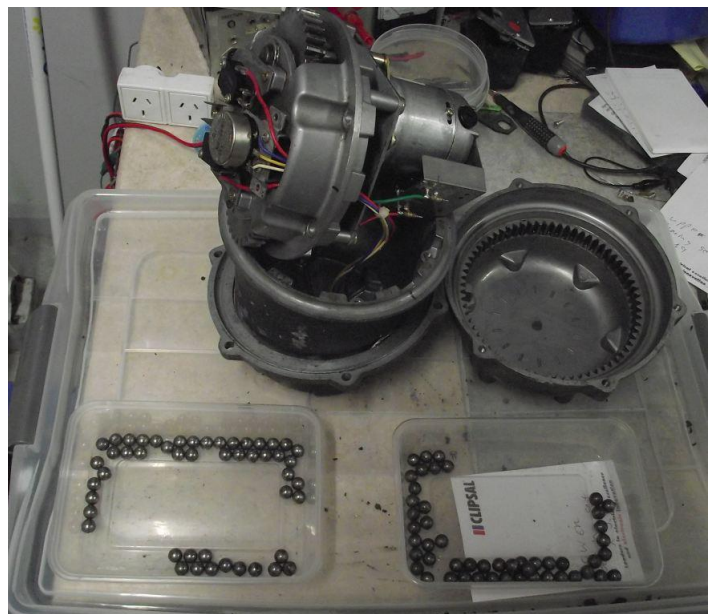
The replacement thrust bearing and waterproof shroud

As was reported, we pulled the rotator out and also found that the thrust bearing at the top of the tower was rusted out and seized up. This was not too much of a worry. I removed the old bearing, cleaned up the housing and purchased a replacement for just \$38 from Warragul. To this I added a new waterproofing rubber boot.

I cracked open the rotator for a closer look. Having done this before, I was prepared and made sure it was sitting in a tray first, as around 100 ball bearings wanted to fall out when it was unscrewed. They are always a delicate and messy thing to work upon.

The news was good. The rotator was fairly clean and mechanically intact. The grease had all dried out and gone hard. The balls were soaked overnight in kerosene then dried. The bearing race was hardly worn at all. On top of the rotator is a floating backstop which operates limit switches to prevent over-rotation. This was also gummed up with dried grease and had probably been giving poor operation. Everything was scraped clean and washed down with solvent acetone.

At this point I performed a full circuit trace, taking note of terminal numbers, switch configs and wire colours. I was going to have to make it go again and I could not find a proper circuit for this old machine.



It takes a lot of balls to put one of these back together

I gently removed the potentiometer, and pulled apart the fine cog assembly attached to it. While it looked ok, I knew that it was noisy and worn after 30 years or so of service. If essential, maybe it could have been pressed back into service, but I was reluctant to do that, as if it still misbehaved, it is a full day's work by at least 3 people to get the tower down, antenna off and to pull it apart again. It is a specialised pot. 600 ohm wire wound, with no internal backstop and a

stubby 6.0mm shaft. I did some research via regular suppliers and there was no perfect match. I found one that would have worked, but the shaft size was ¼ inch (6.35mm) and both the cog and pot were too delicate to easily machine down to size.

After more research I found that 'Duoro Services' in Sydney had the genuine Japanese article as a spare part for Emotator rotators.. \$50 plus postage and it duly arrived, looking good. It was worth the high price just to get a mechanically perfect replacement.



The suspect pot, a delicate assembly



With the pot back together, the rotator was carefully re-greased with anti-corrosion boat trailer wheel bearing grease. This is another messy process, where all 99 balls have to be carefully laid in a bed of grease. The pot is positioned at exactly 50% rotation and the unit was reassembled facing North. With the unit reassembled and wiped down, it was then re-sprayed in grey hammertone paint. Looked like a new one!

THE CONTROLLER

This was the tricky bit. The rotator had a 24VDC motor that required direction control and switching. The potentiometer voltage had to be measured by a microprocessor and turned into a meaningful antenna direction. It had to be safe, reliable and easy to use for a long time to come.

I had a look through my junk box and pulled out a few bits. The new controller was going to be made up of five different systems that we had previously built in the workshop at my QTH. I found a plastic case, a power cord from an old PC, I used a direction selector relay that came out of a golf buggy. A microprocessor controller module from a truck tyre inflation system, A yellow OLED display module from a cow manure spreader system and a block of 10 bit analysis software I extracted from a sawmill log thickening system. Later I added a hydraulic speed controller from a tractor to help slow down the rotation speed. With all of these ingredients piled up, All I had to do now was put it in a box and shake really hard.



Inside the new controller

My aim was to create an intuitively simple controller where the operator would turn the knob to a direction displayed, then the rotator would wake up travel to that direction and stop.

The programming was all in AVR Assembly language. This was a bit hard because a single byte of measurement only goes from 0-255, which is not enough to show 0 to 360° of rotation. This was where the sawmill came in because about four years ago I wrote a bunch of 10 bit manipulation routines for the Poweltown sawmill

where we could slice 1024mm thick logs with 1mm resolution. This code was pasted into the next module, a truck tyre system controller, which had a small AVR micro and some FETs on

board. In principle, tracking a rotator movement to match an operator setting is not too different to tracking an air pressure sensor.

The display was another module I had used before in a manure spreader on a forage wagon that used software to regulate how quickly the shit hit the fan at the back of the wagon. It had a GPS to regulate the manure output with tractor speed in real time. Load cells in the wagon would transmit data to a large yellow display to show how many tons of manure remained in the wagon. In my present context, it was a nice large 32 character display that could be updated with serial data ten times per second at 9600 baud.

The golf cart reversing module had two 30 amp SPDT relays that were perfect for selecting clockwise and anticlockwise directions. I added a third 24V relay to act as a 'power' relay that would remove power from the rotator once the target direction was confirmed.

I dug up a 24V, 3 amp power transformer which was about right to power up the rotator.

It took four hours one night to assemble the unit and probably 6 hours the next night to get the program where I wanted it. There were some tricky scaling factors on the pots to deal with, plus graduated landing zones at the target bearing. I wanted some nice moving graphics to signify rotation and sixteen different directions should appear as targets. (North., Nth-North-East etc.)



The display gives a sense of motion towards a target

I found that this rotator was a bit fast. This had also been a problem in the Club shack in the past. It ran at about 2 RPM, which is too quick for such a large antenna array. This is when I dug out a spare speed controller I'd made last year to control hydraulic flow on a tractor solenoid. I was able to drop it in, with a trimpot to select somewhere around 50% PWM modulation for a 1 RPM rotation. This also solved a slight target overshoot problem I had been experiencing. Like a cordless screwdriver, this technique provides low speed at high torque from a single 50A Mosfet.

```
-----  
; apply the formula: output = (540-input)  
-----  
UNDER_180:  
;---<load up 540 decimal>---  
    ldi    YL,28  
    ldi    YH,2  
    sub    YL,SOURCE_LSB  
    sbc    YH,SOURCE_MSB  
    mov    SOURCE_LSB,YL  
    mov    SOURCE_MSB,YH  
  
;if the result is > 361 then force to 180  
;-----  
;---<load up 361 deg>---  
    ldi    YL,105  
    ldi    YH,1
```

The fun language of assembly programming

One of the final tweaks was to adjust the displayed direction mathematically. In its calculations hard anticlockwise was 0° and hard clockwise was 360°, but rotators don't display that way. South has to be 180° and North is both zero and 360°. This way the bearing would align exactly with values on a great circle map centred on Melbourne. So any reading below 180 degrees had to be subtracted from a fixed value of 540, while bearings above 180 degrees had to be subtracted from 180.

The language of the Arduino is probably more friendly for this type of calculation, but as I didn't want to re-write all routines from scratch, it was ultimately easier to stay with assembly language programming

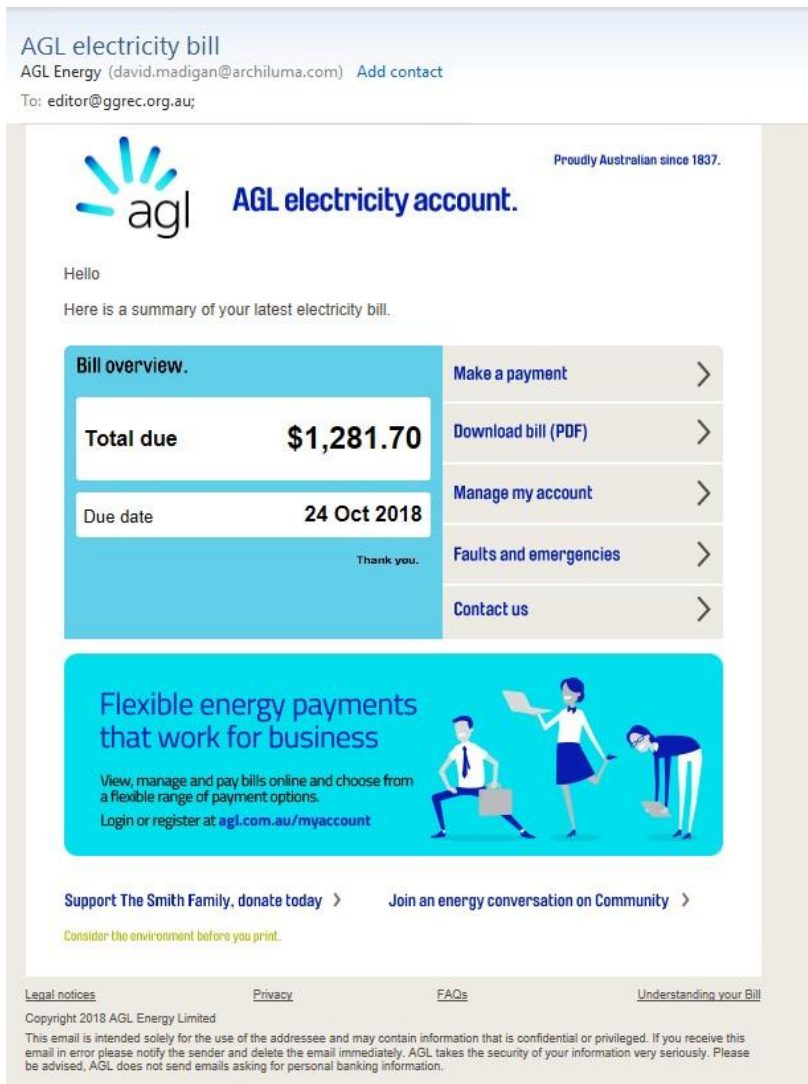
So with the assistance of a few Club members, the rotator has been restored to the tower and we now get to point the antenna where it ought to be pointing.

With a bit of luck this system should last another thirty years, after which time I'm hoping it will be someone else's problem.



..... We have rotation!

Scams, Scams, and more Scams



Do you blindly pay bills as they arrive?

This bill kind of looks ok, just like all AGL bills, but hang on a minute – Just who sent it to me?

David Madigan? From where ???

Now as I hover my mouse over the 5 tabs in the bill, and have a look at the bottom of the screen to see where they are actually taking me, 4 go to AGL, good, but one, the actual bill leads me off to a foreign website.

(Note, the tabs and links are not live in this PDF/Magazine)

Then of course there is the small detail of why this bill would be emailed to me in the first place.

Oh no, the NSW government is after me for a toll on one of their tollways, or is it waterways – must be tollways as I don't have a boat.

But hang on again, what is this bit,

Our mailing address is "Aaron Photography", Winton park FL 32..."

The 'FL' bit is the best, it is short for Florida, in the USA!

This scam must have been put together by a 5 year old, having the address so obviously wrong.

Dear Valued Customer,

Please find attached your E-toll(**NSW ROADS AND MARITIME**) account statement.

[View attached Invoice and Account Statement](#)

Thank you for you choosing E-toll

Regards

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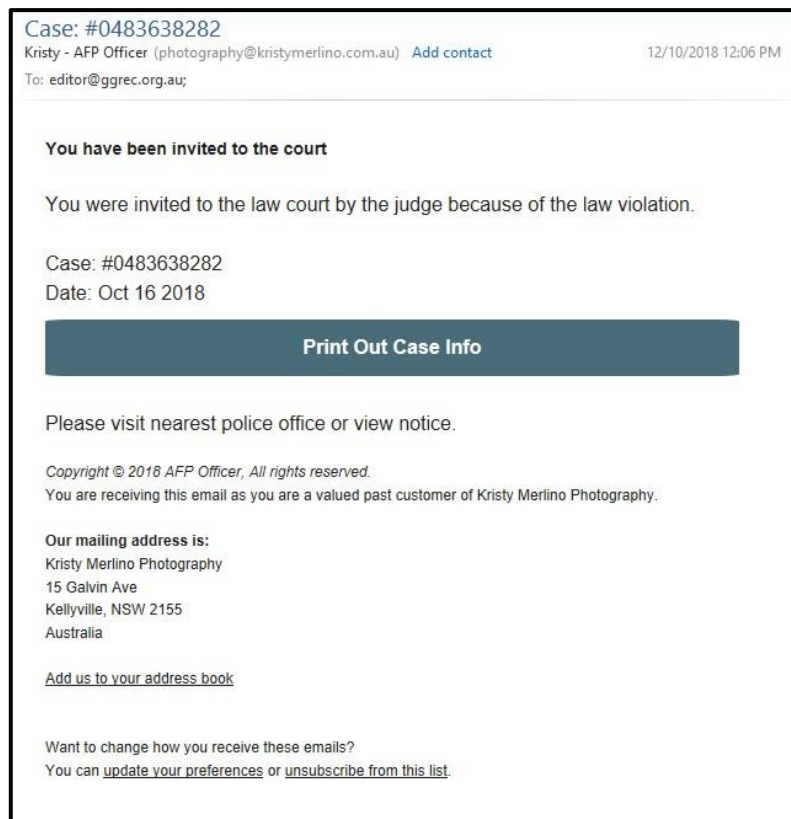
You are receiving this email because you have done business with us in the past as either AaronVan Photography or photoStyles.

Our mailing address is:
AaronVan Photography
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Winter Park, FL 32792

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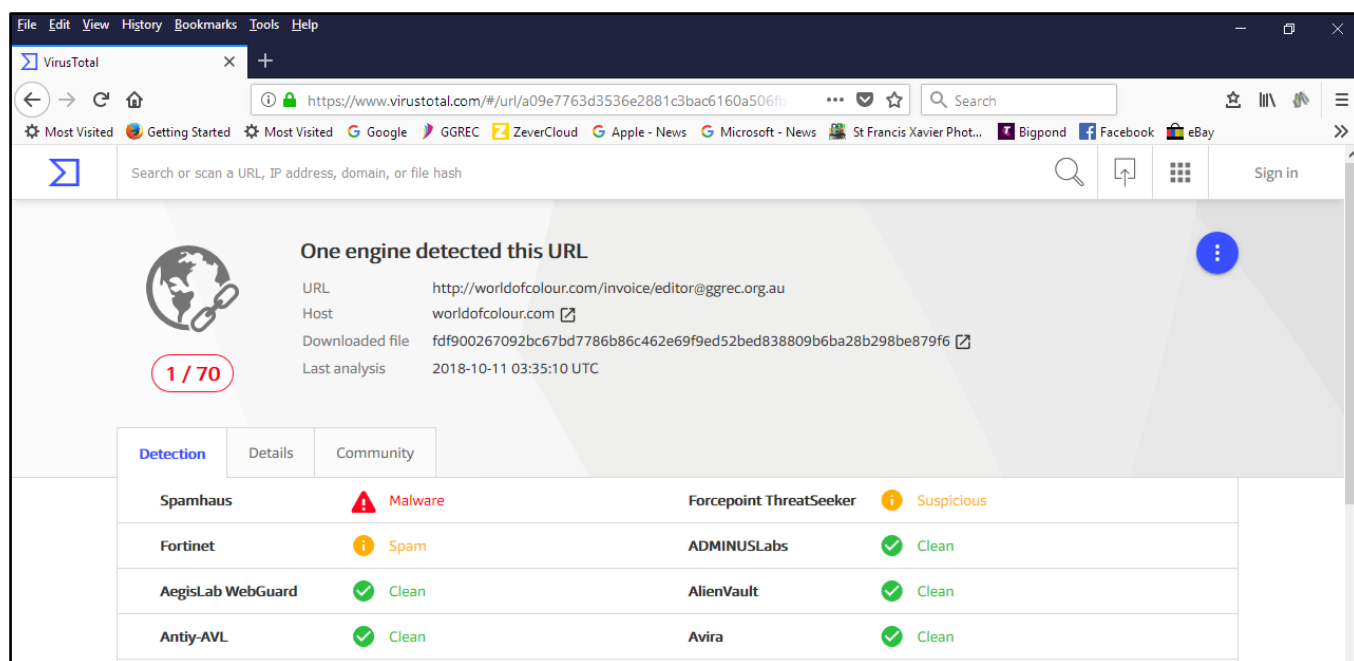


Oh no – the Federal Police are after me – I’m been called to court!

But hang on, it’s another photographer, at least she is from Aus, not the USA

This is a small selection, some are fairly obvious, but others, especially when they purportedly come from an organization you regularly deal with can be a real trap.

As I mentioned earlier, being able to hover my mouse over links etc. to examine where and what is a real bonus, however if you run your life from a mobile phone then your options can be severely limited.



One tool you can use is <https://www.virustotal.com/#/home/upload> Grab that dubious link and have this site scan it for you, it’s primarily after malware and viruses, so if it is just a dubious product push, then it will probably say its ok. (By dubious I mean ‘another set of steak knives’)

After that, then report it to the ACCC Scam Scamwatch site <https://www.scamwatch.gov.au/> unfortunately they don’t allow email uploads, so passing on the exact details is a tad tricky

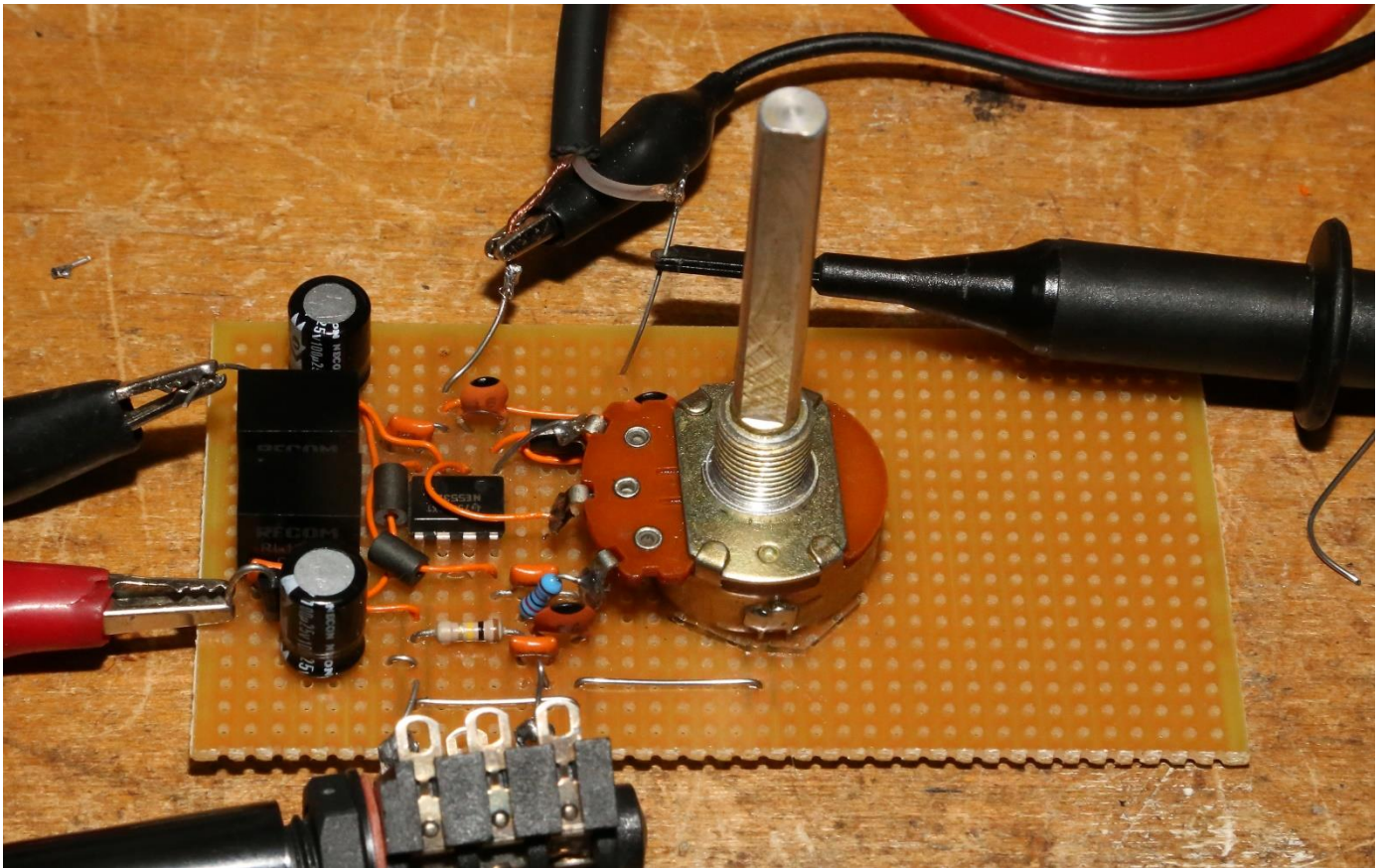
And of course there is our friends at the ACMA, forward it to report@submit.spam.acma.gov.au

They both will acknowledge your submission, unfortunately it stops there – it would be nice to hear that they are actively pursuing someone etc., but they never say a sausage.

So watch out, And stay safe.

Paul VK3TGX

Variable Gain Pre-Amp



Fixed gain amplifiers are nothing new, however they do have their limitations especially if you occasionally need lots of gain. I was working on an active speaker that I started a while ago, built from various donations & cast offs. (I held a speaker in front of an old TV, I liked the look)



It basically had a fixed gain that was never right. If I connected it up to my computer it was too sensitive, however if I connected it to a wireless microphone receiver, that purportedly had line level out, it was woefully inadequate.

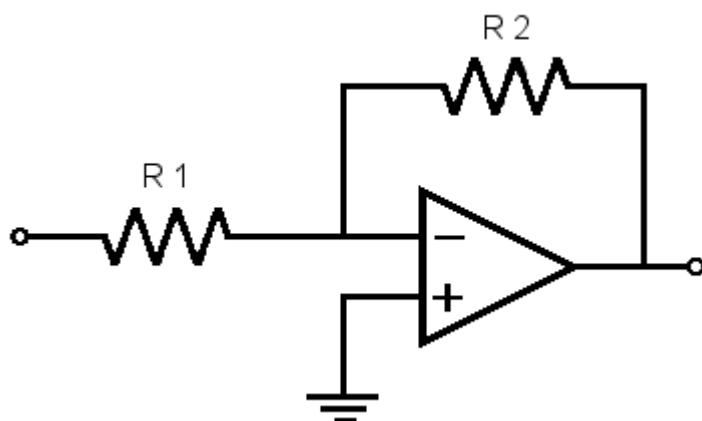
Ideally it should be able to handle anything from about 2V RMS (Line level) down to the output from a dynamic microphone (millivolts).

For an input socket I had fitted both ¼ inch (6.5mm) and 3.5mm stereo sockets, the output of these are mixed together to give mono sound.

This mono mixing actually works against me when a mono ¼" microphone plug is inserted, as one side of the stereo pair is now grounded,

effectively halving the output from the microphone.

If I just made a mic pre-amp, then it would be grossly overloaded by any line level input. Yes I could put in a front end attenuator, but this has its limitations as any high gain stage will always produce more noise than a low gain stage. One solution is to provide two different inputs and some associated input switching, I was after a simpler solution, one that didn't need any labels and/or instructions. Just to be able to shove in a plug and wind up the volume until it works.



This is your basic op-amp circuit; the gain is set by the ratio of the two resistors.

Gain equals $R2$ divided by $R1$.

$R1$ becomes the input impedance of the amplifier – that is until one overdrives it then things get a little more complicated.

So if one makes $R2$ variable all should be ok?, so that was basically my plan, however I did go for a variation to that theme.

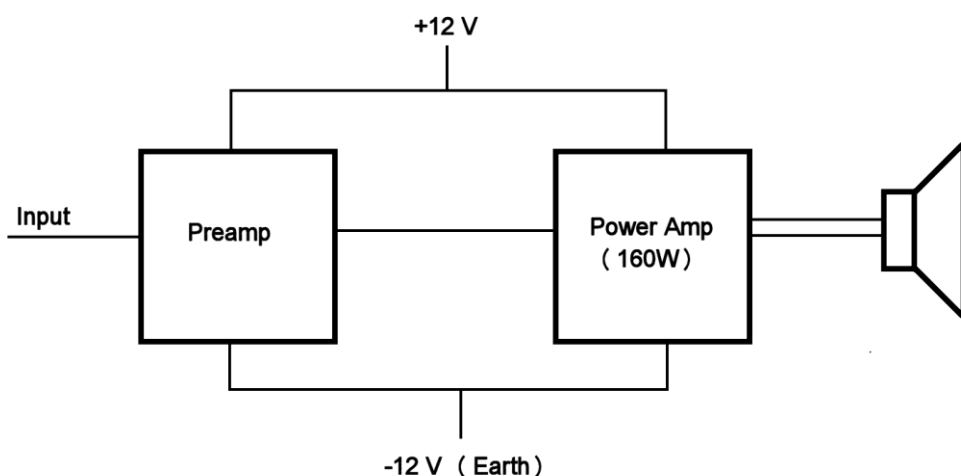
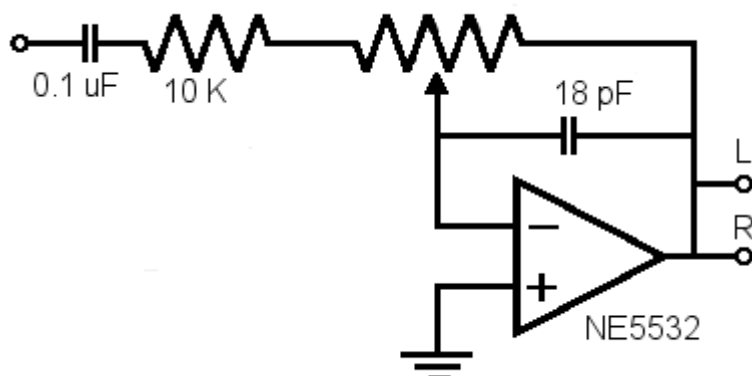
This is the circuit I ended up with, as you turn down the gain, it also reduces the input signal present at the op-amps input, and increases the input impedance. The resistor at the input is required so that there is a limit on how much gain the op-amp will try and deliver, it also sets the minimum input impedance.

Without that input resistor you would end up with the open loop gain of the op-amp. As there is now no effective feedback the

output pin of the op-amp would tend to wander to one of the supply rails resulting in a very gainy and heavily distorted output. – Maybe of use to an electric guitar player as an effects pedal, but not much else. Also as the gain is increased the input impedance drops and the input cap starts to roll off the bottom end, handy with dynamic mics as they can be rather basey.

The next part of the build was a suitable power supply. In this case the whole box run's off 12VDC, from an external battery or power supply. As I didn't envisage any sort of heavy use for it, an internal battery sounded like a bad idea as it would probably be flat (and stuffed) whenever I went to use it. (I'm surprised the club's PA amp hasn't suffered a similar fate)

The main amplifier is a commercially made car audio power amp, complete with a 15A? blade fuse in its input, so a simple 240VAC supply was also problematic, not that I wanted it to be tethered to a power point. (I have a few 240V amps, so another one was pointless)



This circuit is what you would probably think of when powering the pre-amp, the problem being that of voltage drops on the wiring. On audio peaks with 15A going up those leads there will be inevitable voltage drops on the wiring. Without due care some very nasty feedback can result, or at the very

least you can have a very distorted sound as the power levels increase. Why? Well consider an instance where the power amp is pulling 15A, which is going to cause a voltage drop on the wiring to the amplifier. Let's assume we lose 0.2V, this will mean the actual negative terminal on that amp will now measure 0.2V with respect to the battery. On the other hand the preamp will be drawing negligible power and its negative lead will be 0.0V. This means there is now a 200mV difference between the two amplifier modules earths, not very good as we are running a 500mV audio signal between the two. It does not matter how good the screened audio leads are, 15A will well and truly overwhelm them and modulate the 'crap' out of your audio signal.

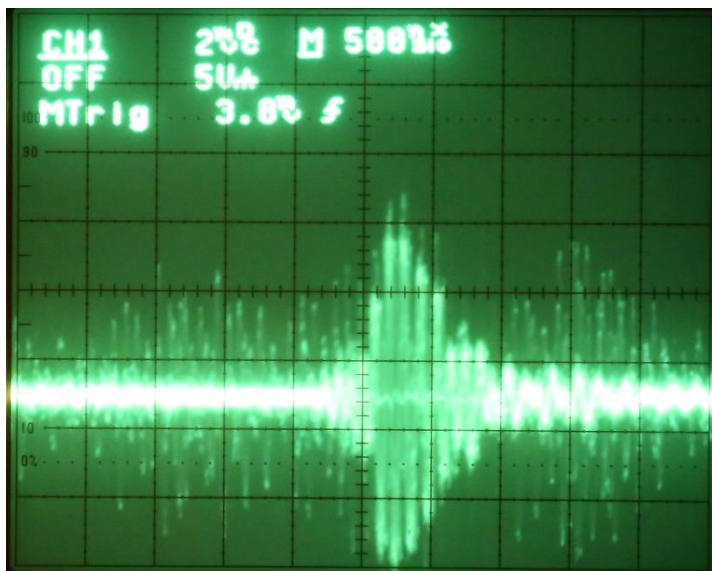
My solution was a pair of isolated 12V to 5V DC-DC converters, their inputs were placed in parallel across the incoming 12V, their 5V outputs were placed in series to give me a '+5,0,-5V' split supply to run the opamp. If I didn't have anything suitable, I'd probably be on Banggood etc. looking for a likely contender – either that or grab a small transformer, a 555 timer as an oscillator and make my own. There was one other option, and that is to open the power amp and extend its internal front-end supplies out to my preamp. they will have gone through much the same process, and made sure no effects from heavy load currents would get anywhere near the front end supply lines and the input RCA sockets.

Actually, in my case the power amp was already DC isolated, but I still had to isolate the preamp so I would not run into trouble when I tried to amplify a source that was also powered from the same battery. (Just imagine what a .2V earth shift would make after 30+dB of gain from my preamp!) The whole thing is now DC isolated, so we should be 'good to go'



After I kind of had it all working I hooked my scope across the preamp's output, Yuk, look at all that crud.

So I put an 18pf cap across the opamps feedback resistor (pot) to curtail its high frequency response, especially when the gain was wound way up. It does not effect it so at lower gains as in with a line level source, but it definitely kicks in with a dynamic mic, starting at 10KHz and up (who needs to hear 'blurrp, blurrp, blurrp' from your mobile phone). Yes that's not HiFi, but what top line artist is going to let rip on one of my creations.



Anyway, after adding that cap, and also a LC output filter, and a pile of 0.1uF caps around the switch mode converters, as well as some ferrite beads, I still had these blips – And No I wasn't thrashing my scope to get this image, it was done with the lights out, at night.

After stuffing around for a few hours I temporarily threw in the towel and left the shack for a cup of coffee and a break. On returning I turned on the workbench and the scope. I was looking at those nasty spikes when I suddenly realized I hadn't actually

reapplied power to the pre-amp. In fact just having the scope's earth lead connected directly to the probe's tip produced the same crud on the scope's screen.

So I spent the next hour or so trying to trace that rubbish, I pretty well shut down everything, and it was still there. And as it was now quite late into the night, I knew it couldn't be my solar inverter blasting back through the house wiring – so what is it – I still don't know.

Last prac night we looked into making small 2M Yagi antennas quite suitable for DF-ing a noise source, but chasing this one? The only way to get a dead trace was a direct short (or no lead) on the front panel of my oscilloscope.

Getting back to the noise bit, it is a very good idea to make sure there is no high frequency noise present. Anything, especially that over 20KHz is not going to be audible, however your power amp will likely try and amplify it, possibly placing great stress on the amp, and if you are not lucky, it will all end up in your tweeters and smoke will soon ensue.

In a previous project I was using a Silicon Chip SC480 amplifier module to feed a pile of speakers around my house. As part of the testing I hit the amplifier with a very healthy 20+KHz sine wave and was promptly rewarded by smoke streaming from it. On the amp's output is a filter circuit designed to keep the amp stable at high frequencies and avoid any possible instabilities (self-oscillations etc.) and that was what I smoked up (and burned the PCB)....

So if your kit starts to roll off near the top of the audio band, it's not that bad. The audio purists say you should not limit things, and that a bandwidth up to 100KHz is good, however if you don't have the test equipment to measure noise up there then avoiding it is the safer option.

I did toy with the idea of fitting an el-cheapo digital front end module from Banggood, that would have given me USB/SD card playback, alongside Bluetooth and an FM radio, (See my "From The Editor" story on page 5), however that was probably total overkill for this project.

I had been asked to provide a sound system at an outside church function, so that was the excuse for me to get this speaker into shape. I did try it last year, but as mentioned earlier, a Shure radio mic system was unable to drive the bare amp to a usable level. (I did have a plan 'B')

This time around feedback was easily achieved, and I had to back it off somewhat as it was getting into the too-loud area, not bad for an outside setup made from scrap.

Afterwards good feedback was received, everyone was happy.



Paul VK3TGX



Club Information



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

Office bearers

President	Bruce Williams	VK3BRW	Web Master	Mark Clohesy	VK3PKT
Admin Sec	Michael Van DenAcker	VK3GHM	Magazine Editor	Paul Stubbs	VK3TGX
Treasurer	Chris Chapman	VK3QB	Property Officer	Bruno Tonizzo	VK3BFT
General 1	Barry Hamilton	VK3ABH	Secretary	Ian Jackson	VK3BUF
General 2	Ron Lacey	VK3FRDL			

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 VK3RLP, In 434.475MHz Out 439.475MHz CTCSS 91.5Hz
VK3RLP Repeater supports Remote Internet access (IRLP), Node 6794.
70cm Repeater Seaview VK3RWD, In 433.575MHz Out 438.575MHz CTCSS 91.5Hz
Simplex VHF - 145.450MHz FM, Simplex UHF - 438.850MHz FM
VK3RLP Beacons 1296.532MHz & 2403.532MHz (currently inactive)

Membership Fee Schedule

Pension 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 at each April Annual General Meeting.

Magazine Articles to editor@ggrec.org.au or vk3tgx@gmail.com Cut off, 10th

All other Club correspondence to: secretary@ggrec.org.au
or via Snail Mail : 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 via email webmaster@ggrec.org.au

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