GATEWAY

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

May 2023

VK3BPT's HF Whip Antenna

Digital Audio Woes & Fun

News From The Treasury

And More

WIA Affiliated Club

Cover photo, Bruno receiving his award for his contributions to the club, keeping the club running during the difficult times over the COVID lock downs.
(If you have any good photos, please send them in)

Contents.

Event Queue

May:

5th	7:30	Prac night
19th.	8:00	General Meeting
20 - 21st.		Don Edwards Memorial Slow Morse Contest – courtesy WIA

June:

2nd	7:30	Prac night
16th.	8:00	General Meeting
24 - 25th.		Winter VHF-UHF Field Day – courtesy WIA

Club run events are only possible with the involvement of ALL members.
Without volunteers to coordinate and participate in club events the club will fail to prosper

President's Message

Hi GGREC members. If you are reading this it is because we have concluded another AGM and we now have a new committee. Many thanks to Bruno for his work as president in recent years and for a smooth transition of all the bits and pieces that go with it. A hearty welcome is in order to all of our new committee members.

This is not my first time in the chair. I joined the GGREC back in mid 1977, when my transport was still limited to a bicycle. By 1978 I had a full call Amateur license and a driver's license. That got me on the air and mobile. In fact my brand new FT101E cost more than my first car. That rig is still on the shelf next to me, which is more than I can say for my 1963 mini.

Back then the full license was a written exam. They would ask nine questions and we had to answer seven of them – essay style - and get a 70% pass for our efforts. Exam events only happened once every six months and you had to pass all subjects within the same 12 month period, or earlier passes expired.

I'll stop reminiscing lest it starts to sound like a Monty Python sketch *lamenting "Ohhh.. when I was a lad, we ad it tough!"*

So now after a 6 year break, this is my tenth year as GGREC president and twentieth year to serve on the committee. I have been busy in the gaps. I have served five years with RASA management team and have just wrapped up the 8th Antennapalooza event. The important question is what does that mean for GGREC?

It is no secret that it is harder for all clubs to fill their committee positions. There was hardly a rush to the GGREC polls at our April AGM. I'm convinced we do have a good team running the Club and I'm hoping we can stir things up a little bit. I want to see more Amateur Radio stuff happening and unleash that wild and barely restrained creativity of our members.

Lets face it, soldering irons make lousy hand warmers, or rather they work, but pretty soon it starts to hurt too much. There must be *something* else they are good for.

Also, everyone has a story to tell, an experience to reveal and a skill to share. I want to be tapping on a few shoulders and thrusting them under the spotlight for exposition and fame. Don't be shy. I won't be marking on grammar and poise (in any obvious ways). Our radio club is not a faceless entity, it consists entirely of the people who are in it.

Let's consider what we can do this year, pick some projects and events and make them happen, even if it's something simple, like working out the inductance of a mosquito coil.

Cheers, Ian VK3BUF

Whats up?

GENERAL MEETING THIS FRIDAY NIGHT

We'll be keeping them brief and probably fewer of them, in favour of more Amateur Radio topics. But this Friday will get things started.

SALE NIGHT THIS FRIDAY

We will make this Friday night a swap & sell night, so if you have a few items to move on, bring them along and put a price on them. (What you don't sell, you must take home. The Club shack space has to be preserved.)

MID YEAR GGREC LUNCH

The new committee has picked a date and venue for the GGREC Mid-Year Luncheon. It will be at the Dandenong Club on the corner of Stud and Heatherton roads on July 15.

The WARRIGUL-DROUIN REPEATER

VK3RWD, our 70cm repeater is not currently operational. We intend to activate it soon and see how much traffic it generates for the rest of the year.

BUNNINGS SAUSAGE SIZZLE

We aim to do another one of these this year. No dates yet. Keep watching this space.

RADIO REPAIRED

The FT920 donated to the Club gas been repaired and is in the Club shack. We hope to exercise our shack radios soon and see how well they perform on the now upgraded Log Periodic antenna. We ought to have a session on how to use both this one and the FT950. There are a few tricks that we ought to share.

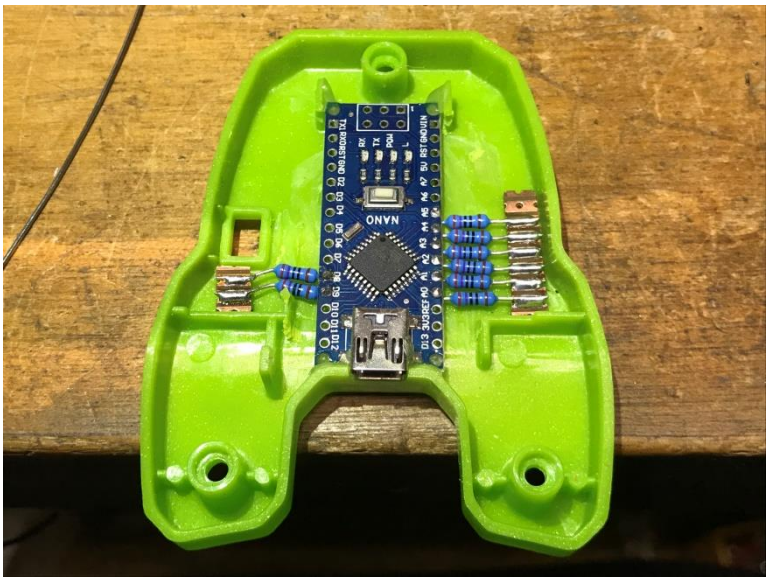
CLUB MEMBERSHIP RENEWAL

Klaus, our Treasurer has been working on this and most members have come to the party on time. If you haven't yet paid, or can't yet pay, See Klaus when you can. He's a friendly guy and is happy to accept your money.

A BRING SOMEBODY ELSE NIGHT

This is an un-thought-through concept that would be nice to try this year. The idea is that every member should attend on a certain night and they have to bring a non-amateur with them. The theme that night would be a rolling ten minute session on *each of top ten things Amateur Radio operators do*. Most members should know at least one non-Amateur. If you don't, then come via an Uber taxi and drag the guy inside. Quite possibly we will lock all the doors to stop any premature escapes.

From The Editor



This month I've been catching up with some Arduino projects.

This one is a tiny hand held tennis game from McDonalds. The LCD screen was tiny, but not as tiny as the figures on it. I could play in under a Maggie lamp, but that seemed a bit silly, so why not extend the silliness, recycle it. So I put in my default micro, an Arduino Nano, not that much else would fit. Then came the screen, it was kind of crying for a nice OLED screen, but they cost and this is kind of junk, so into my junk box and the best fit I had was a seven segment LED display. So what can you do with a single digit in an old McDonalds toy? Not much.

Ever tried to design a game using a single 7 seg display? I haven't…

Years ago, when I was looking into building a Nixie clock, I came across a bloke who built a few into odd places, however the most noticeable thing was these only used a single display tube. Maybe he was having trouble getting them – not sure, however I can't say I've seen his approach anywhere else. To show the time he simply sequences up the digits one after another. This struck me as a tad awkward.

So this is what I'm going to get this McDonalds toy to do. Yes I could have just rigged it up on a proto board, however I have this looking for a use…

If it does work out I do have a single digit TTL based nixie counter, maybe I can swap out the 7490 decade counter and insert a similar sized micro to run the code I'm dreaming up for this one.

Another one is a more practical box fitted with a four digit vacuum florescent display (VFD) from my late parent's oven. It has three 240V relays in there so this should make a nice timer/sequencer for mains appliances, for high tech items, like fairly lights at Christmas….

This one was actually in this mag quite a few issues back, I made a blunder or two then lost interest – I had accidentally allocated two input only pins as display drivers – oops.

My main driver here is the same as I've heard said about our radio bands, use them of lose them, in my case it's my noggin rather than radio bands.

Paul VK3TGX

NEWs FROM THE TREASURY

From Klaus VK3IU

Membership fees are now overdue!

As our financial year has officially ended in March, all your membership fees are now overdue.

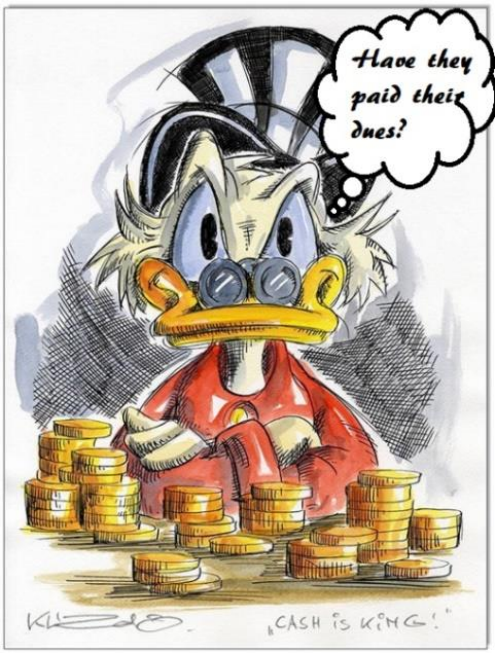
If any member is experiencing financial difficulties, we encourage you to reach out now to our President in confidence so we can find a way to support you and ensure you don't leave the club.

Electronic fund transfer is the preferred method of payment

GGREC BSB 633000 - Account 146016746

always identify your EFT payments with your call sign or for SWL with your last name.

- Full Member $50.00
- Pensioner Member $40.00
- Junior Member $25.00
- Extra Family Member $20.0



I will confirm your payment by email within a week. If you don't receive a confirmation email after a week of making the payment, please contact treasurer@ggrec.org.au. No need to inform us that you have paid as we will see it in our accounts.
If you decide not to renew your membership, please let us know by email before the AGM so we don't follow up on your payment.

The Committee has send out a reminder to the none financial member, if you received it please pay ASAP as otherwise your member ship will cease.

GGREC financial report in a nutshell

WHY DO WE NEED YOUR MEMBERSHIP PAYMENTS

During the AGM, we discussed the financial report for the last fiscal year. We're happy to report that our membership increased from 50 to 58, and we welcomed eight new members to the club! This is great news and we hope to continue this trend as new members bring fresh enthusiasm to the club.

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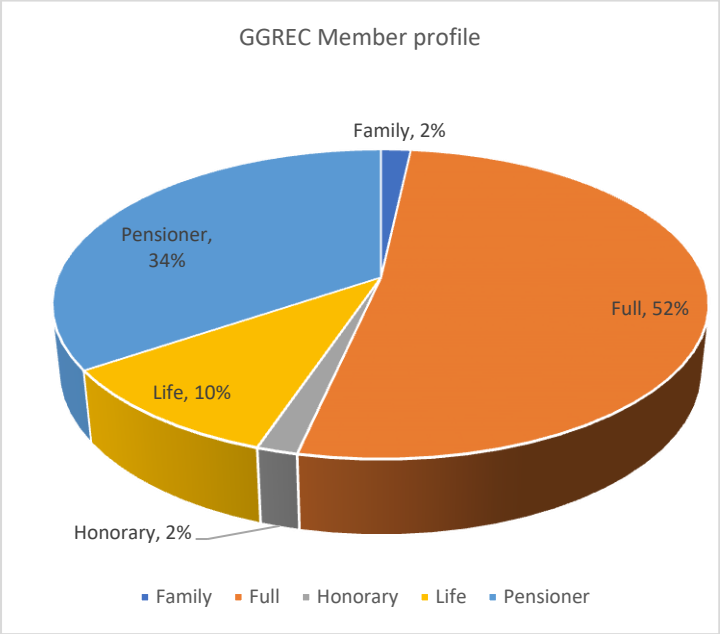
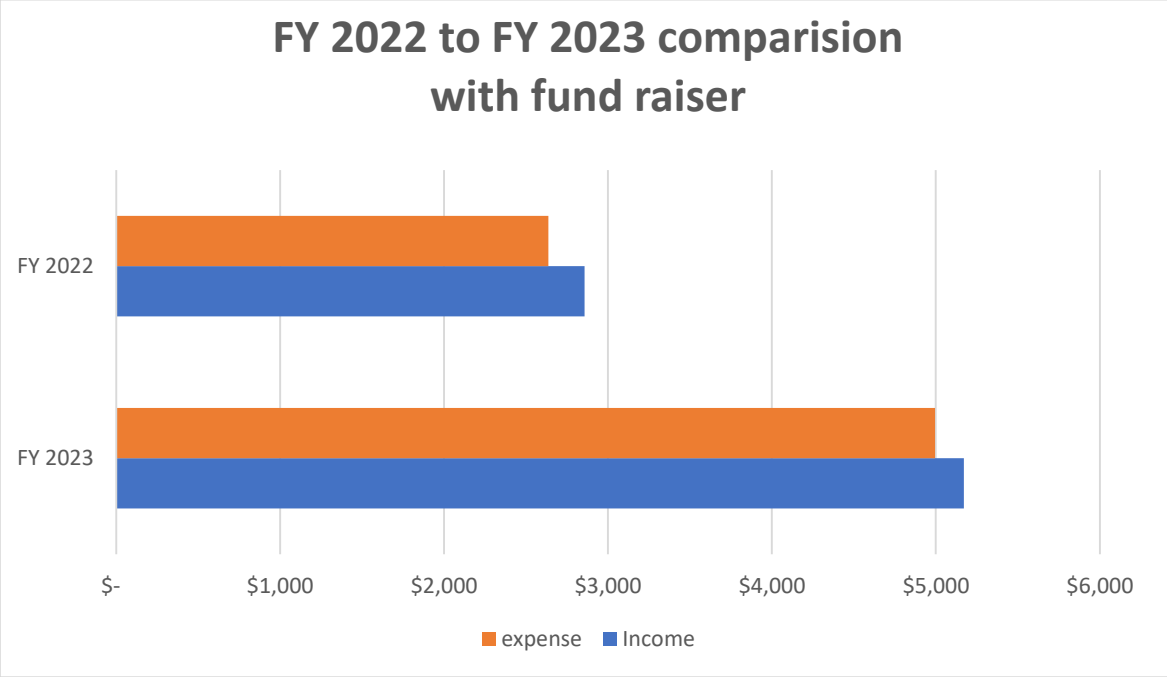


Bruce Thorn - VK3BPT
Francis D'Mello - VK3FDM
Goran Pejovski - VK3GPL
Daniel Gangemi - VK3LCM
Steven Schnitzler - VK3OZI
Paul Starkey - VK3PCS
John Cheeseman - VK3XM
Gerry Watts - VK3ZXC

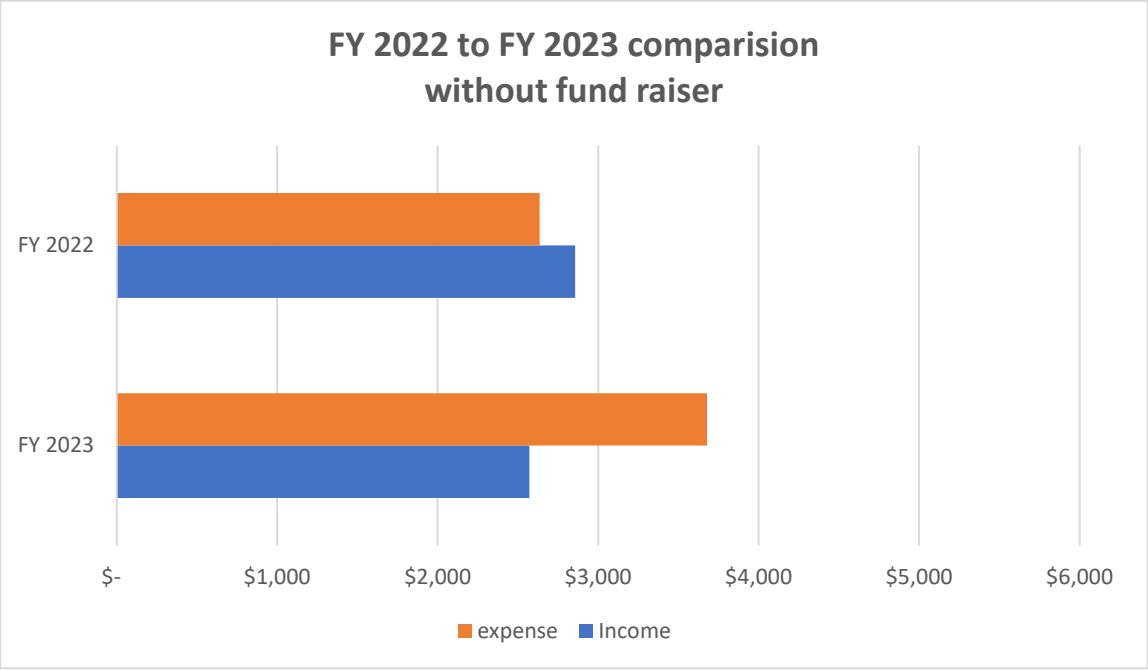
We welcome the new members into the club

Financials

We collected $2,320 from membership fees, which is important to help support the club's activities. We had a small surplus this year, which is great news. However, it's important to note that fundraising is crucial to maintaining the club's financial stability.



To highlight the importance of fund raising I removed the income and expenses from our Bunnings Sausage sizzle fundraiser.



Without income from our Bunnings Sausage sizzle fundraiser, we would need to increase membership fees by up to 60% to maintain the same activities for our members. So, please volunteer to help with our fundraising events!

Main reasons for the cost increase:

- In 2022 we still suffered under COVID restriction and where unable to use Club Rooms or the hall to the normal extend.
- The Girls Guide decided to not charge in FY 2022 for the Guide Hall use.
- We now paying again for the Guide Hall use 2 x per month. We actually should move some of our come togethers back to the club rooms to safe on this expense.
- Insurance cost went up
- Club Rooms are more often used now after the COVID lockdowns and increasing the operation cost

How to ensure our cost are meet

In order the keep the membership fees at current level we will need to

- At least one, better two Bunnings sausage sizzle or
    - Source further funding, community funds, sponsor ships, donations etc
    - Limit the use of the Guide Hall to GM and AGM
      meaning move the PRAC night back to the club rooms.
- Pay your member ship dues on time
- Maintain a membership of >50 members.

Klaus VK3IU

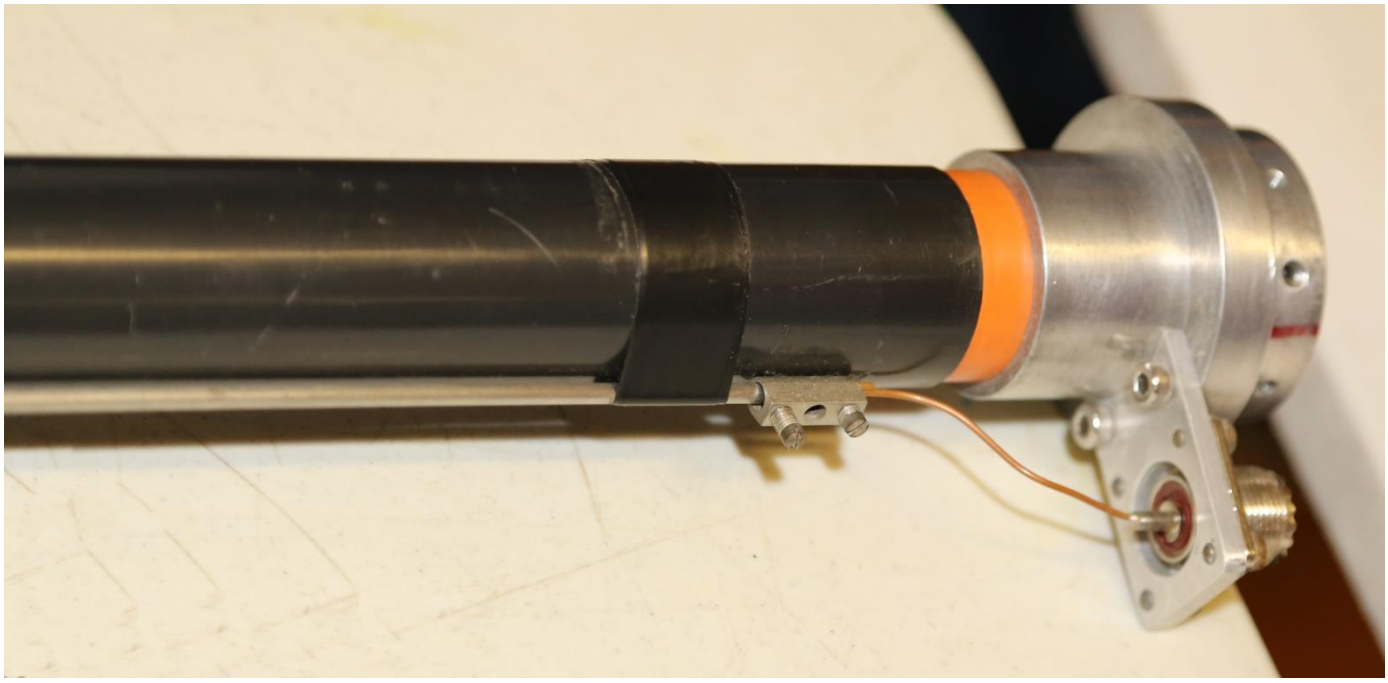
VK3BPT`s HF Whip Antenna

With variable tuning for outback mobile operation

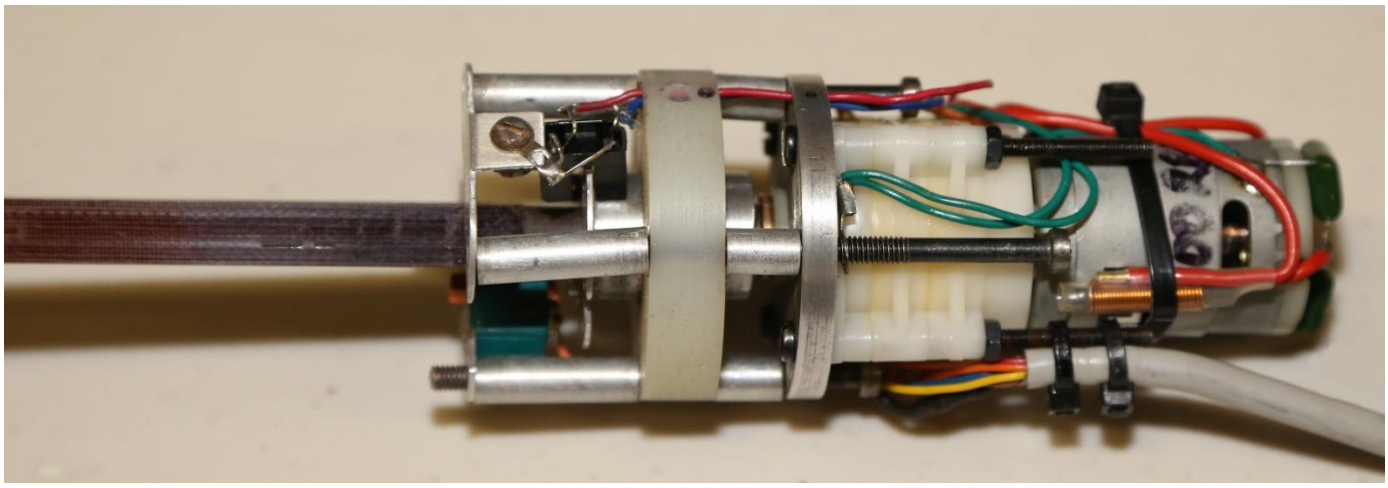
Frequency range 2.5MHz - 30MHz (useable on Ham bands plus RFDS frequencies in the range of 4 - 7MHz)

"Designed and built in the mid 1980`s and finally commissioned in 1989. Overall height is 2250 in the down position and 2550 fully up. It weighs 2kgs, plus as it was designed for bullbar mount an extra 1kg for the base spring takes it to 3kgs. The body of the car acts as the necessary counterpoise. It has travelled over 60,000km and still going strong"

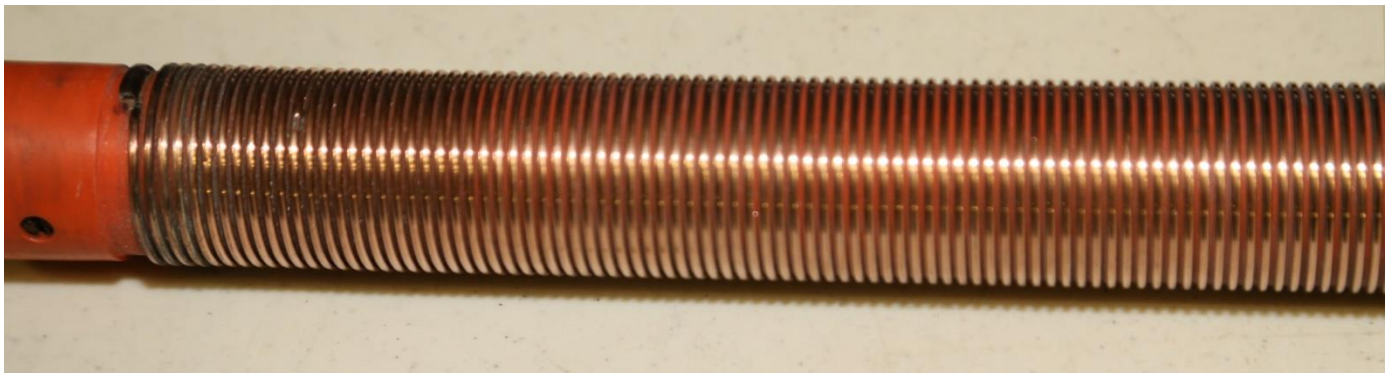
"With careful tuning, SWR is less than 1.2:1 on all frequencies. Efficiency and radiation patterns have never been measured - suffice to say it works well"



The outside housing is a standard 32mm Ø electrical PVC conduit. Inside this is a 25mmØ PVC conduit onto which a loading coil is wound…. and inserted inside the bottom end of the loading coil is a short 20mm Ø PVC conduit that houses a length of F14 ferrite inductor that was found to be necessary to tune to the lower frequencies. The whip section protruding out of the top is 3mm Ø stainless steel

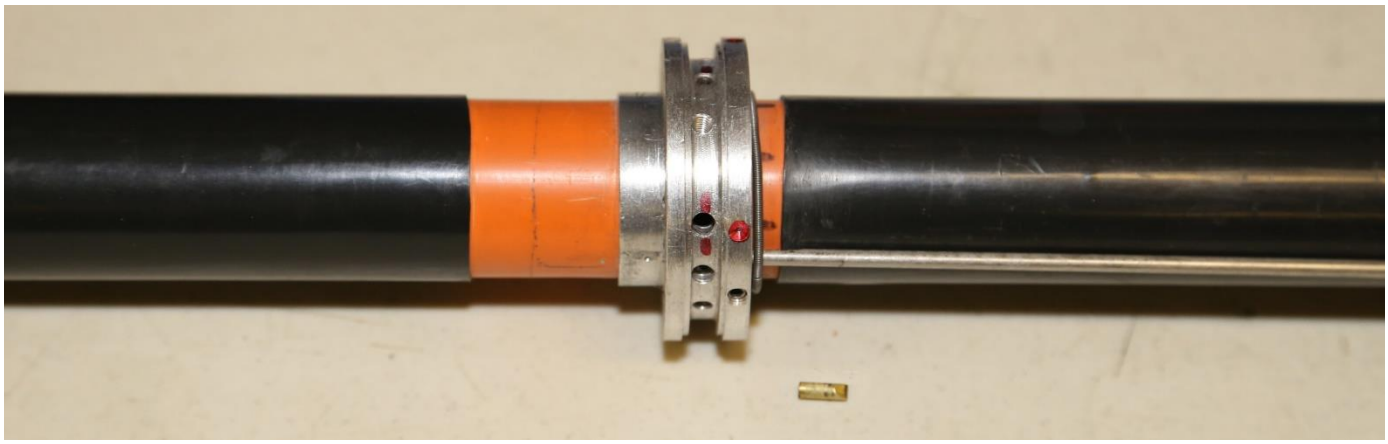


"In the base of the antenna is a motor from a 12V cordless drill that is fitted with a 30:1 planetary reduction gearbox with an output speed of 300rpm. On the output of the gearbox is an opto-chopper with a 4 slot vein to count motor revolutions. In line with the motor, gearbox and opto chopper is a long 8.5mm square bakelite shaft that fits up inside the loading coil assembly which drives (rotates) the whole loading coil assembly"



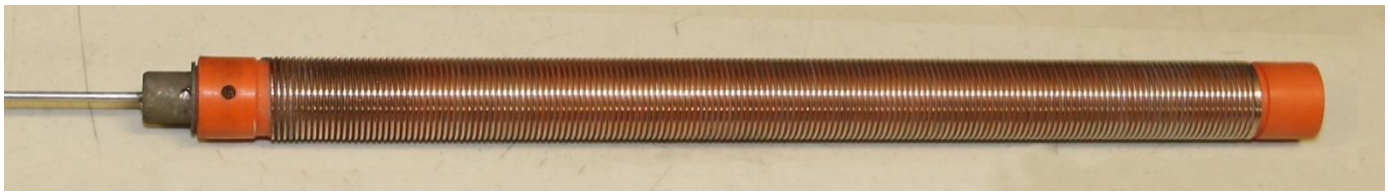
The loading coil (the 25mm Ø conduit) is 355mm long and has a 14tpi thread machined into it which is over-wound with 171 turns of 1.2mm Ø tinned copper wire. The bottom of the loading coil is open-circuit and the top is connected to the bottom end of the stainless steel whip.

In the very bottom of the loading coil assembly is a plug which has a square hole into which the square bakelite drive shaft fits.

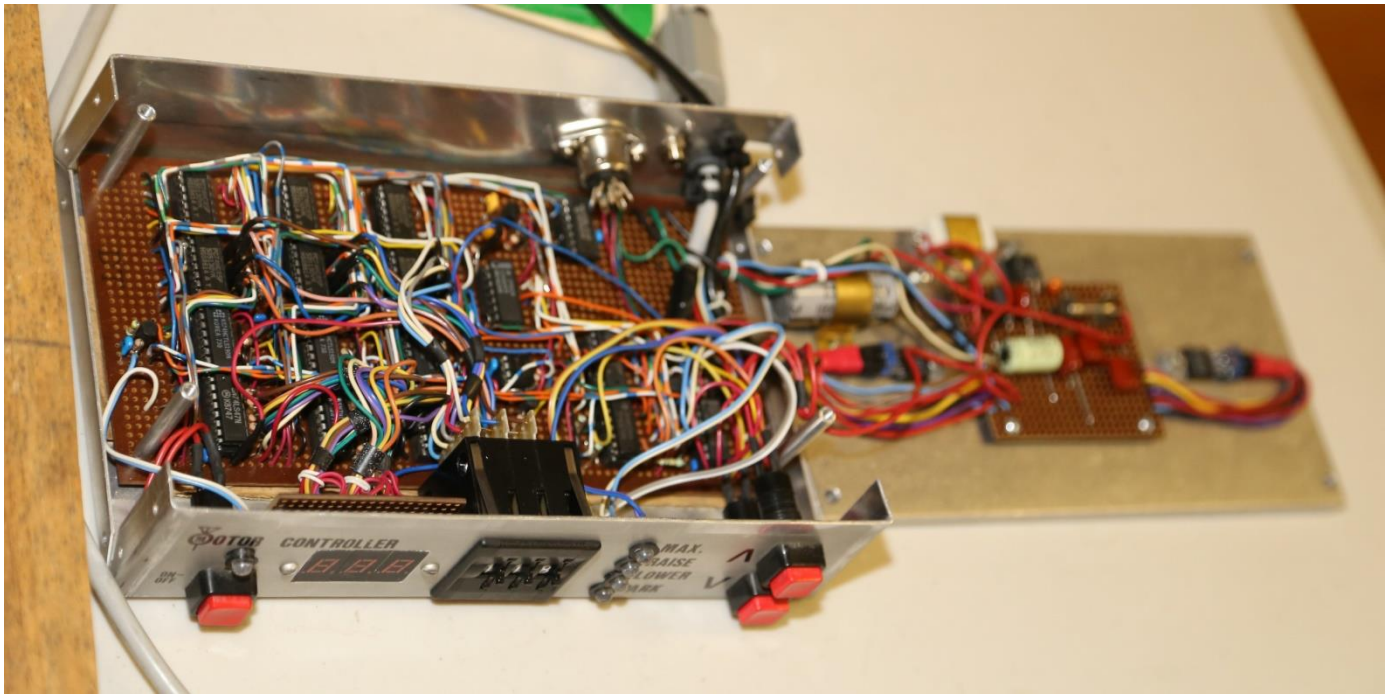


In the middle of the antenna is a metal coupling ring which houses 4 contact pins that project through the outer housing and contact the internal loading coil. A garter spring on the coupling ring pushes the pins into the coil winding

There is a shorting bar that drops down from the central coupling ring that connects to the centre connector on the SO239 socket at the base of the antenna. The base of the SO239 is at ground - counter poise potential. In the down position the shorting bar effectively shorts out radiation from the loading coil.



"The loading coil`s 14tpi thread has a pitch of approx. 1.5mm, therefore with the 4 slot chopper vein, a 1/4 turn will raise or lower the coil just under 0.5mm and so provides for very fine tuning to achieve resonance"



"The antenna is controlled by a digital based system on which the operator sets the required count (number of rotations of the loading coil) on thumbwheel switches and a digital readout displays the progress of the motor winding the loading coil up or down. Subsequently it knows the exact position of the loading coil inside the coupling ring. So after setting the count on the thumbwheel switches, it is just a matter of pressing the ""raise"" button which will start-up the motor up and so drive the loading coil to the set position and stop."

"As the motor drives, when it gets to within 10 digits from the selected position, the motor slows down to zero-in to the selected position. Once at the selected position the motor stops - but will follow any thumbwheel changes (up or down). It is then only a matter of recording the position for the particular frequency and establishing a list of settings. "

"When you are finished using it , pressing the ""lower"" button will lower the antenna fully down and the counter`s digital display will be reset to zero. At switch on, if the `set count` is still on the thumbwheels, pressing ""raise"" will raise the antenna back to that position. If the controller is turned off whilst the antenna is raised, at the next 'switch on' the antenna will lower itself to the down position and reset the display and be ready to use"

VK3BPT Bruce

Digital Audio Woes & Fun

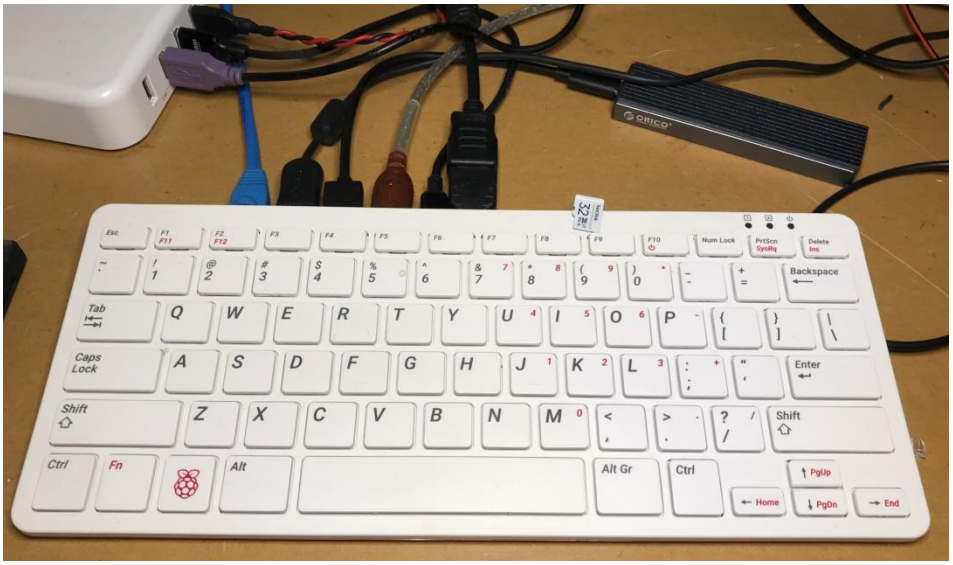
Back when I was a young one starting out on my first job at Telstra, I finally gathered enough money for two items that interested me, (definitely not cars) A computer and a sound system.

My first stereo was a Dick Smith/Electronics Australia kit, a twin25 Playmaster amp, driven by a Sanyo belt drive turntable. Later I upgraded the amp to 40W a side (new transformer), built the matching Playmaster graphic equaliser, then I added a Tandy (Teac) open reel tape recorder, a Teac cassette recorder, then a Sansui AM/FM tuner, and finally a Marantz CD player. (well maybe not in that exact order)

Come the present day, the open reel is with Mike VK3KTO, the tuner sees basically no use, the equaliser is up on a shelf in my study…. My system is mostly a Yamaha amp driven from a Raspberry pi based music streamer (Volumio) and not much else. Well I can switch in audio from my TV or a set top box, or a hardly ever used CD, or an even less used turntable, with the latter two not being powered up in the last few years. All my audio in on my computer, all my CD's and vinyl has been ripped & digitized, and often I just listen in my study.

Lots of young ones don't even own any audio, they just use a subscription based streaming service like Spotify, with many other options out there (Not for me…) on a phone and feed that to a Bluetooth speaker or headphones. Actually 'headphones' have spurned up a great big fraternity of users, I'm guessing brought on by living too close to neighbours to allow speakers.

Actually I now have four audio systems, my study, radio shack, lounge room & a front spare bedroom where I have a pile of machines (PC's) in various stages of build. (My wife says 'junk!')



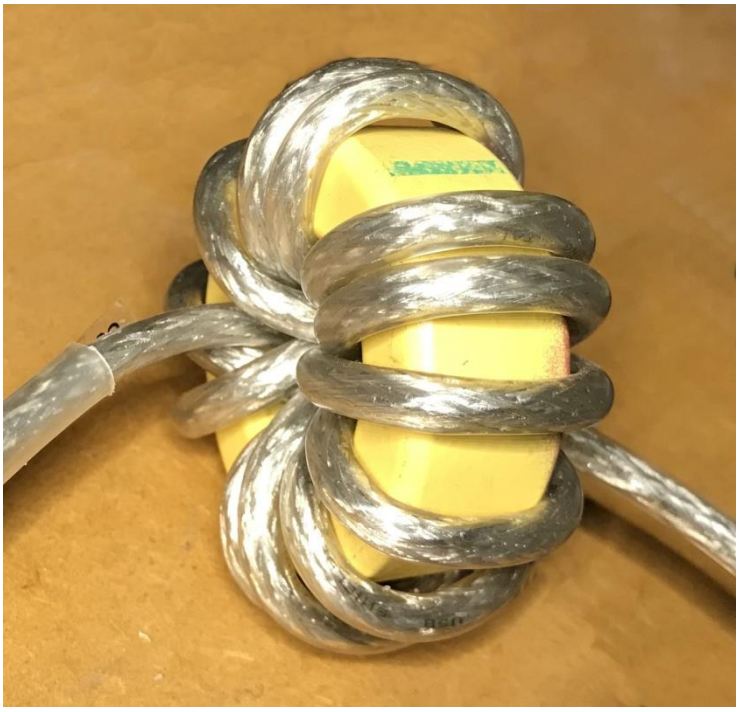
It is in here that I have been having a bit of fun using a Raspberry Pi 400 computer as a music system. It kind of sucks playing YouTube video's (Ubuntu & Firefox) so music is its main use now. Unfortunately that 'Pi has no audio out, it all goes out the HDMI monitor port to your monitor – of little use to me as my screen has no audio. So the answer to me was a USB DAC, (Digital to Analogue Converter) feeding a very nice Pioneer amp picked up from a swap meet.

That DAC, a no-name from my junk box, was giving me horrible results, lots of buzz, and other random digital crud. So get a better DAC?, well unless I spend several thousand dollars I would probably not see any improvement, for all that crud was not actually the DAC's fault, it was all coming from the 'Pi. However there is nothing wrong with that Raspberry Pi.

The Raspberry Pi is a digital device, there are thousands of signals generated as the processor talks to all the peripherals, obviously the power supply provides the juice for all this, and that current, from the +5V rail has to return to the supply via the negative, or earth rail. All wires

have a resistance, so any current flowing through them will induce a voltage, a rather random noisy one. And guess what, this power is shared via the USB port to power the DAC, which then couples it into the earth of the audio amplifier, my HiFi, so it all gets a tad noisy.

The noise you get depends on what computer you use, many are way better than a 'Pi, although it is still there, it just depends on how good your audio gear is and how quiet your listening environment is. If it's a car, or a busy workplace, or you have active kids about you can probably get away with much, but if you value your audio and arrange a quiet place, not good.



My first thought was to get a long USB lead and wrap as many turns as possible through a toroid, this kind of worked, however it manly took the top end off the noise, as in only the higher frequencies and turned it into more of a murmur sound.

The next thing was to connect a better ground between the DAC and the amplifier chassis, again this did help, and I now had a somewhat usable system.

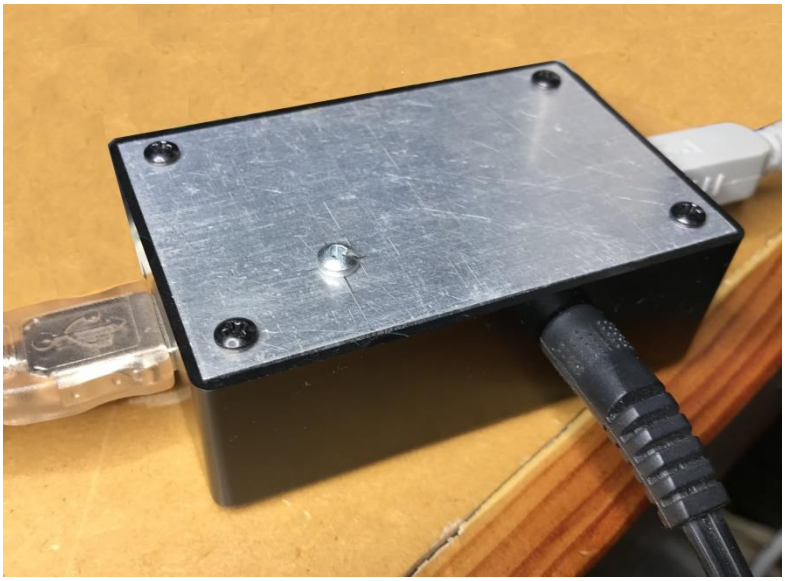
BUT, it was still there, not happy!

The other day I was watching a YouTube video from PS Audio, where Paul McGowan mentioned putting a USB hub in the line, sounded a tad non-intuitive, HOWEVER boy did it make a difference. In my case I used a hub with an external power supply, it was in my 'Pi kit box, but I hadn't brought it out because I was not short of USB ports, add to that the 5V to run this hub was coming from the same four port USB power supply running the 'Pi.

The only explanation is that the DAC was now getting a cleaner 5V direct from the supply, rather than via the 'Pi.

Unfortunately, by the time the USB from the 'Pi had run to the bub, there was not enough left to then power the downstream DAC, so I cannot comment on whether just adding the hub alone would help. On the other hand, was the DAC on the verge of dying due to a lack of power from the 'Pi. Running a 'computer' from a 5V USB based supply is really pushing things, it's just enough, with little to no margin. USB leads are thin by their very nature, so getting a solid low impedance 5V through them is near impossible. The latest USB 'C' spec has added the option to allow greater voltages to be used (USB Power Delivery), and while the 'Pi is powered via a USB 'C' socket, it's only at 5V, so any resistance, of which there is heaps, is detrimental to the cause. I specifically bought the shortest USB 'C' lead I could, and that supply is rated at 2x 2.5A, however I'm also running a USB M.2 drive via the 'Pi, so obviously I'm pushing things.

On one of that USB supply's ports is a 2000uf capacitor to try and stabilize things, it now boots reliably, something that was kind of hit and miss before. I also tried a full blown PC power supply among others for the 5V, however it was no better. So my next port of call is to abandon that crappy USB 'C' port and run some decent copper wire straight into the back of the 'Pi.



At the end of that recent deceased estate auction we had at the club was a few boxes of no takers, in there was a USB power injector project, it hadn't been finished, but it was all there, all it really needed was final assembly into its plastic box, so 99.9% done.

So would adding this to the audio, or is it 'the USB chain', improve things?

I'm currently running this from an old school iron core transformer based 12V power supply I built something like 40 years ago. If I wind the amps volume all the way up, with nothing playing, there is some 50/100 Hz noise – not sure of the source, however digitally it's near perfect, so I am very happy right now.

So why my comments about a better DAC not offering anything better, well unless you pay big and get a DAC with a galvanically isolated input, you will still be at the mercy of USB/earth born crud. There are lesser priced DAC's with integral power supplies, but with a common earth, so maybe they would help – I don't know, I just 'fixed' what I had rather than applying a multi thousand dollar high end audio 'sledge hammer' to the problem.

Here is a pic of my 'computer lab', where my secondary 'Pi based sound system lives.

I don't know about you but putting a high end DAC in here seems very inappropriate.

Now if I could find a way to tidy that sound system up….

I need more room.

Now this leads me to thoughts of improving my study's sound system, where a HP i5 based Windows 10 system provides the processing grunt. It feeds both a SMSL M100 DAC, and a Behringer DX2000USB DJ mixer (Courtesy Mark VK3PKT) feeding a Marantz SR14EX home theatre amp. I used to think it was great, however having another amp in there as a monitor on that DJ mixer has me wanting to improve things. Normally the Marantz feeds the incoming audio through some DSP magic, that I was initially unaware of, however hearing its output alongside my Silicon Chip SC480 based amp, I can hear a delay, it's taking my freshly converted to analogue audio and re-digitizing it, modifying it some ways, then converting it back to analogue. To me this sounds crazy and kind of stupid. I can hit the 'direct' button that bypasses it, however the sound does not really improve, plus I lose the subwoofer output. Not happy!

So I have a replacement amp lined up, No guaranteeing it's any better, but that's the fun of playing with audio, swapping things in and out trying to do better.

Home theatre amps have been traditionally regarded as bad for HiFi, great with movie pop's and bangs, but not much else. However mine has Marantz written on it and they traditionally know their stuff. However, looking inside it appears Marantz's solution to the problem of audio quality in a tightly packed box was to use heaps of bias, pushing the beast towards class 'A' operation. The heat output and the power consumption all allude to this approach, and this is with only two of its outputs functional – I've disconnected the remaining three due to a fault. So I'd hate to see how hot it gets when fully operational. The five 50W power amps are built around a wind tunnel heat sink. I've never seen the fan kick in, but it's surely close.

The SC480 amp is not exactly high end, Yes it does sport 0.005 percent distortion figures, however the Marantz does not seem to better it, unlike the Pioneer SA-508, read a nice review

https://audiokarma.org/forums/index.php?threads/sa-508-wasnt-meant-to-be-this-good.73272/

Maybe I should take his lead and put the pioneer into my main system, for his thoughts reflect mine, I've teamed it up with some tiny Philips speakers, it makes them shine.

With my previous success, I'm contemplating making a really nice linear power supply, with over the top filtering to make it as quiet as possible. 'They' sell 'audio grade' power supplies at incredible markups, I've seen pictures of the innard, I'm sure I can do the same from mostly junk box components, all I need to buy is a heap of low ESR, 115 deg C caps, and I should be set.

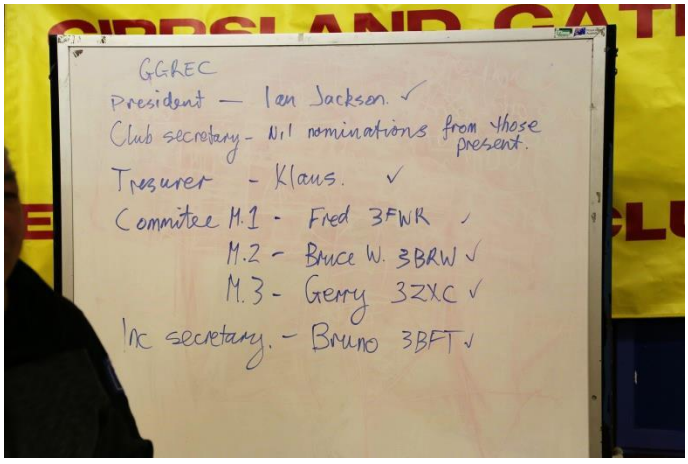
For the USB 'problem', I have an optically isolated USB setup, as in two boxes that are connected by fibre over several hundred feet. They were probably intended for extremely harsh industrial electrical environments, but I'm sure having only a few feet of fibre should not be a problem. You can't get much more isolated than that.

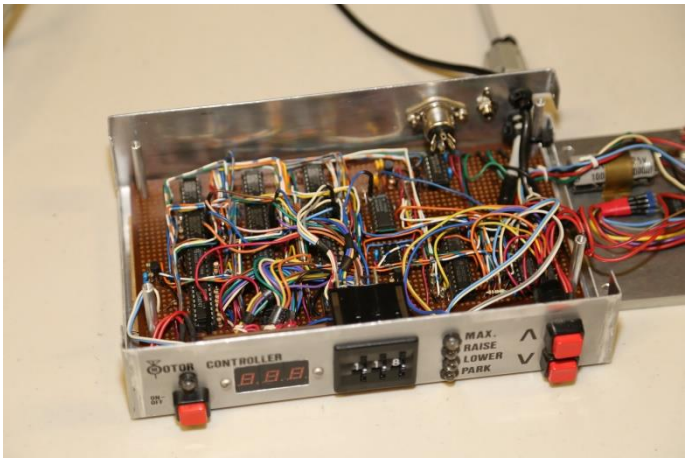
So will it sound any better, I don't know, all I can do is keep ticking the boxes and hope for the best, then keep looking for more boxes to tick.

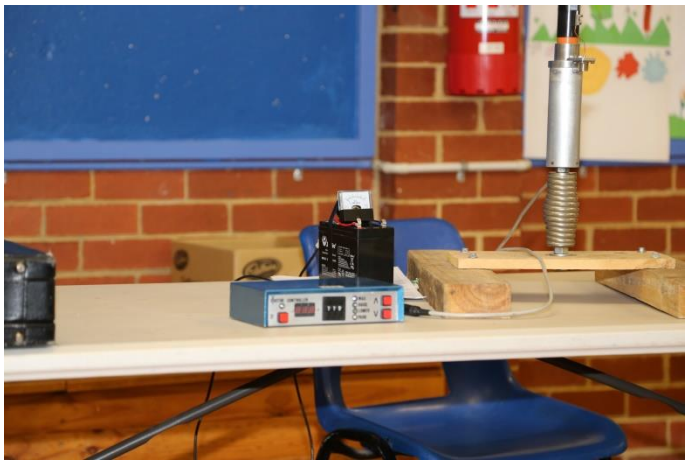
This does lead to one annoying problem, that the golden sound that is sometimes achieved is kind of hard to define with test gear, systems with moderate distortion specs, can easily sound better than something with incredible specs. What gives? Many in the industry would love to know. It appears there is way more to it than easily measured specs, it's also how it interacts with our human ears and brain – you cannot measure that.

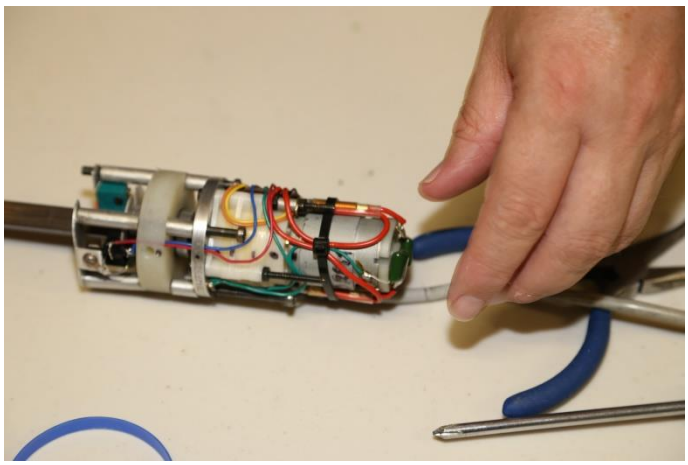
Paul VK3TGX

AGM & Meeting 21/04/2023

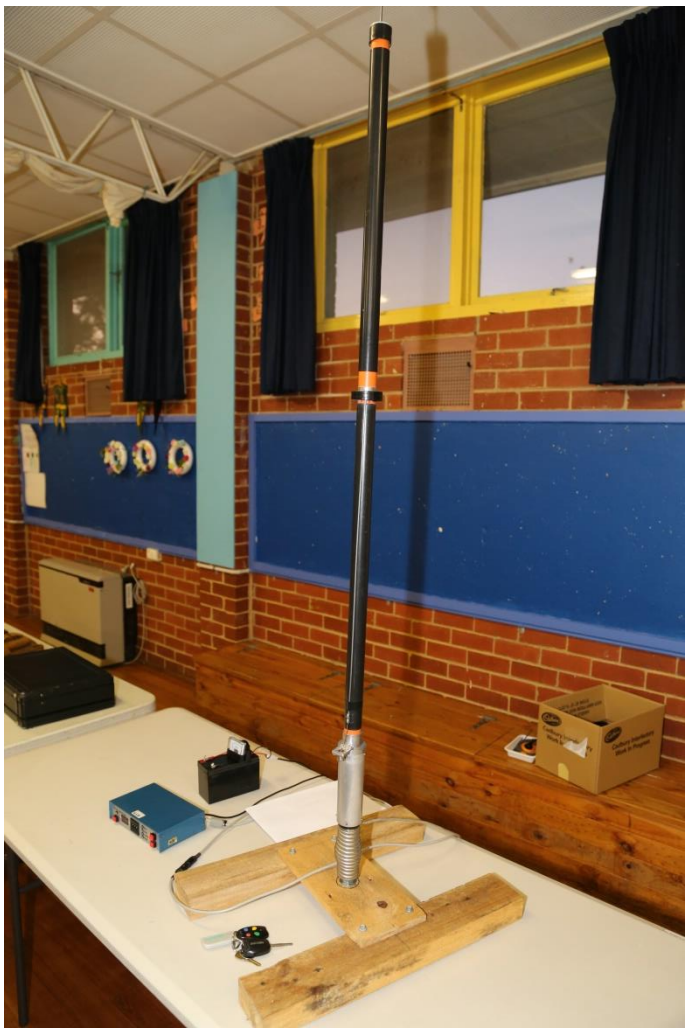






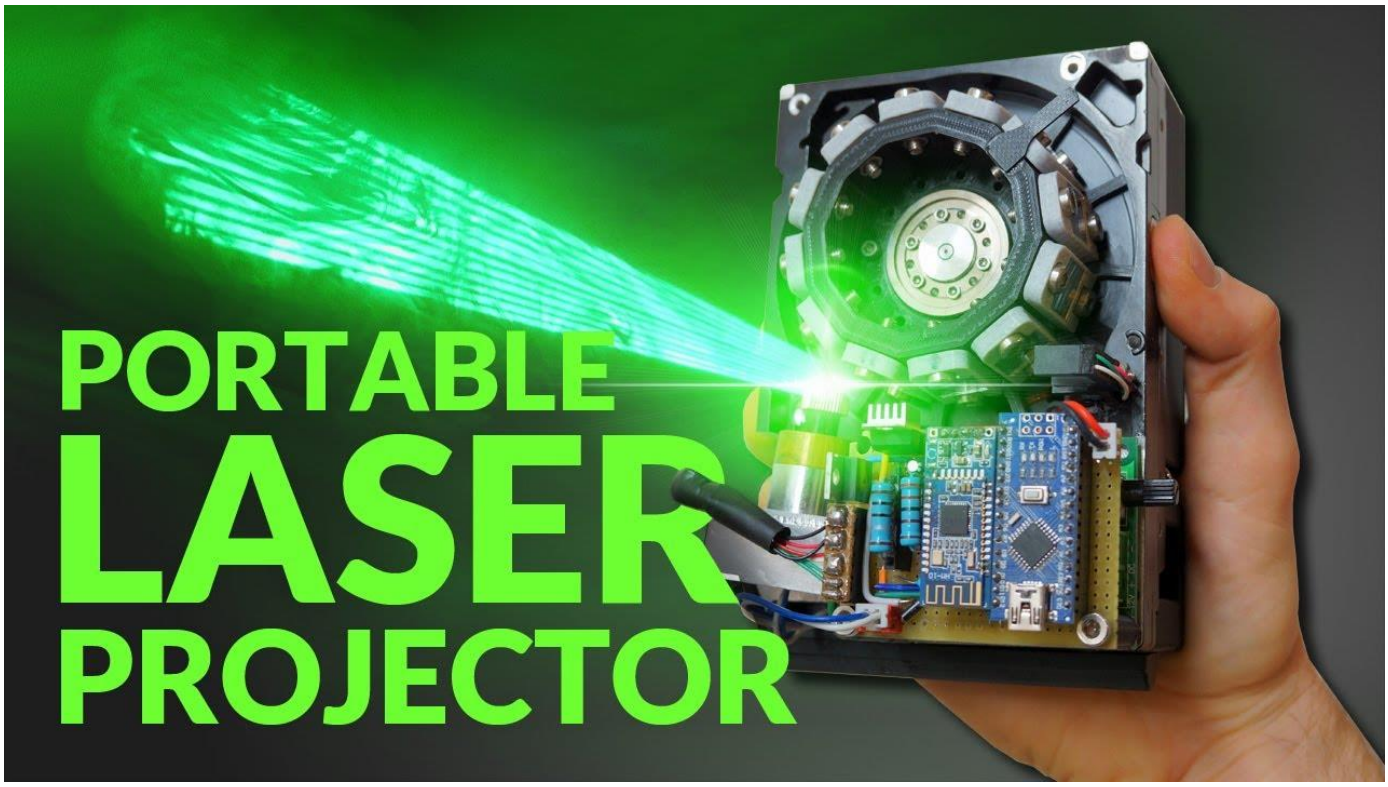



GATE
AND
CLUB



Interesting YouTube Videos

Listening to Weather Satellites with Random Junk
https://youtu.be/yzLUsi8MsRQ



DIY Laser Projector - Built from an old hard drive
https://youtu.be/u9TpJ-_hBR8

WIA Affiliated Club

The GGREC is an affiliated club of the WIA
https://www.wia.org.au/

We also give Thanks to

https://www.jaycar.com.au/

https://www.altronics.com.au/

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	Ian Jackson	VK3BUF	General 3	Gerard Watts	VK3ZXC
Admin Sec	vacant		Web Master	Mark Clohesy	VK3PKT
Treasurer	Klaus Illhardt	VK3IU	Magazine Editor	Paul Stubbs	VK3TGX
General 1	Fred Reid	VK3FWR	Property Officer	'committee'	
General 2	Bruce Williams	VK3BRW	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
All other Club correspondence to: secretary@ggrec.org.au
or via post : GGREC, 408 Old Sale Rd, Drouin West 3818
GGREC Web Site & Archive may be viewed at: www.ggrec.org.au
Website errors, contact web master: webmaster@ggrec.org.au
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