



# GATEWAY

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

**May 2020**



**More Camera Fun**

**Yamaha Repairs**

**Moving Message Displays**

**And More**

Cover photo, Mark VK3PKT's new DC control panel

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Note: - club meeting minutes are on the club website

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## Event Queue

### May:

15<sup>th</sup> General meeting – 8:00, [Via video link see page 2 and club emails](#)  
30-31<sup>st</sup> CQ World Wide WPX Contest – courtesy WIA

### June:

5<sup>th</sup> Prac night, [Via video link](#)  
6-7<sup>th</sup> VK SHIRES competition, 00:00 UTC 24 Hours – courtesy WIA  
19<sup>th</sup> General meeting – 8:00, [Via video link](#)  
18<sup>th</sup> VK QRP Club QRP HOURS contest on 80m, 10h UTC – 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 Report - Tony Doyle VK3QX

Hi Members,

Another month of Covid-19 lockdown and, luckily, Australia is still fairing very well compared to the rest of the world, albeit maybe a little stir crazy.

The PM`s announcement last week has at least given us a glimpse of the future beyond this lockdown.

By the time you read this the Victorian Government will have outlined their initial position for us, which is expected to lag behind other states due to an ongoing increase of cases.

Unfortunately, I expect that it will still be some time before we get back to being able to hold physical meetings.

We are trying to do our best to ensure that everyone can stay connected to the club, however, I must apologise for a dropped ball last Prac Night. Work travel commitments and circumstances conspired to a failure to coordinate Craig`s VK3FHCC latest quiz in time. We should be better organised next month.

Whilst we were trialling the Zoom video conferencing software and members had voted to take up a subscription, a few days after the last GM WIA advised that they were going to sponsor a free trial of their Google Meet platform for affiliated clubs.

This was duly tested and found to be as feature rich as the paid Zoom application and it worked well for the Committee Meeting this month. The WIA offer saves the club \$21 per month we would have outlaid if we had opted for the paid Zoom subscription.

We`ve decided to go with this platform for the coming GM and you should have received a meeting invitation already. The beauty is that it runs in a browser on your PC, thus avoiding the need for additional software. I must apologise for sending out the invitation with everyone`s email addresses shown. Several people have pointed out the error of my ways.

Thank you for the feedback. I am still trying to learn the new platform and I`m sure I will have that sorted out for next month`s GM.

A big thank you must go out to Helmut VK3DHI for his efforts in facilitating the Morse training. This is now in hiatus from low attendance due to work and family commitments.

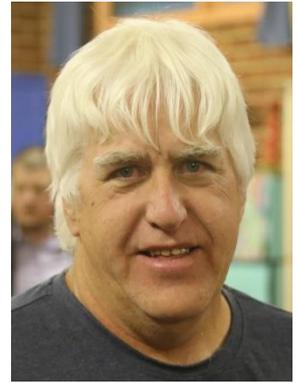
Albert VK3BQO has completed the audit of the club`s financials and we will be ready to share that and any opportunities for improvement as part of the coming AGM process.

I hope to see you all at the GM on Friday Night, via Google Meet this time.

Stay safe.

73

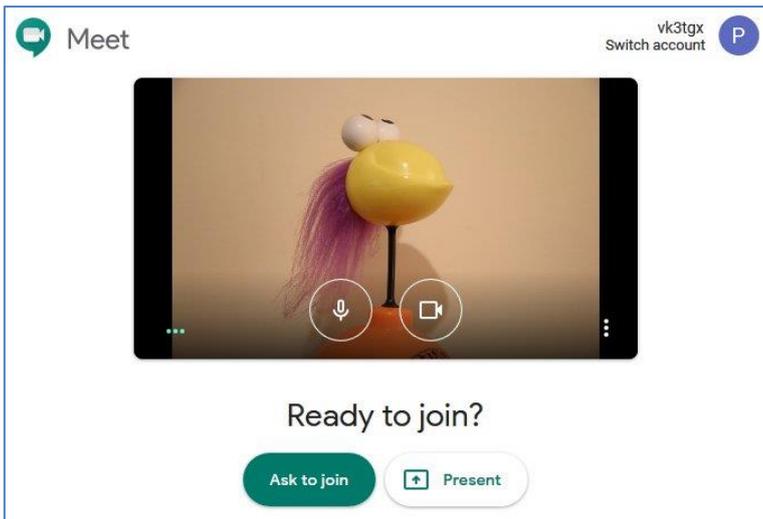
Tony



<https://meet.google.com/hpm-zmoa-ydv>

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If there is an issue with copyright please contact the editor

# From The Editor – More Camera fun



As we move onto our next meeting (and wondering about the AGM timing) it's time to revisit the teleconferencing subject again.

Last months (and Helmut's Morse practice) meeting were not greatly attended, and I'm not sure why, especially in this day and age of smartphones, (that everyone seems to have) 5G, NBN, and all that goes with it.

Many moons ago the club built a TV transmitter; I also built one a while

before that. There is (was) even a repeater or two out there – although I never accessed it.

It was all a lot of fun, not only can one chinwag, but also see what is going on in each other's shack. However there is a downside, the old analogue TV signal is a very wideband signal, and you need quite a bit of power to make it work, or at least a half decent beam antenna, so group net's without a repeater are not really possible.

Enter the modern era of digital radio – D-Star, DMR and many more surely to follow, all flowing over the internet, so it seems strange that club members have been extremely slow to take up



teleconferencing. It's kind of 'in your face' on the TV, with Zoom in particular getting a fair bit of mention in the media, however there are a few other options, especially if you just want a one-on-one session.

For the shack, I kind of recommend one of these 'magic arms', or one of the many clones and variations on the internet. They allow you to mount a camera (phone) almost anywhere, so apart from teleconferencing you can make instructional videos, or maybe your own YouTube channel.

How a Manfrotto-style magic arm clone works. <https://youtu.be/yfE00pXkL8U>

For more 'Big Clives' see his YouTube channel, he is quite successful & his setup is extremely simple, <https://www.youtube.com/channel/UctM5z2gkrGRuWd0JQMx76qA>

If you prefer using your computer, there is a nice little program called iVCam that allows you to use your smartphone camera as a PC webcam, that way you can have a decent size screen with a Wi-Fi connected camera that can be positioned almost anywhere. My church is using just such a system to live stream the weekday masses during the coronavirus period.

So come on, get yourself connected and join in this Friday.

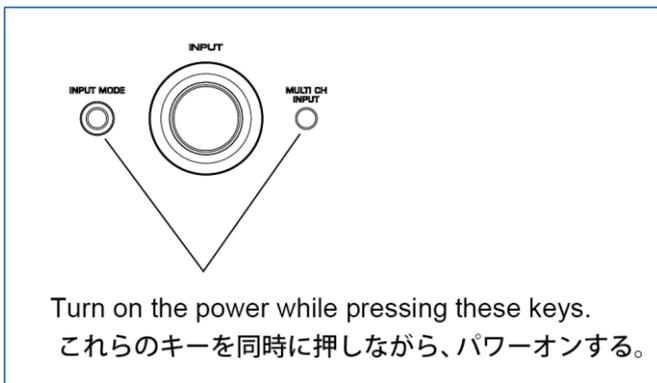
*Paul VK3TGX*

# Yamaha RX-V657 Repairs



A while ago Mark VK3PKT asked me to have a look at this Yamaha system he purchased online, unfortunately it arrived as a non-worker.

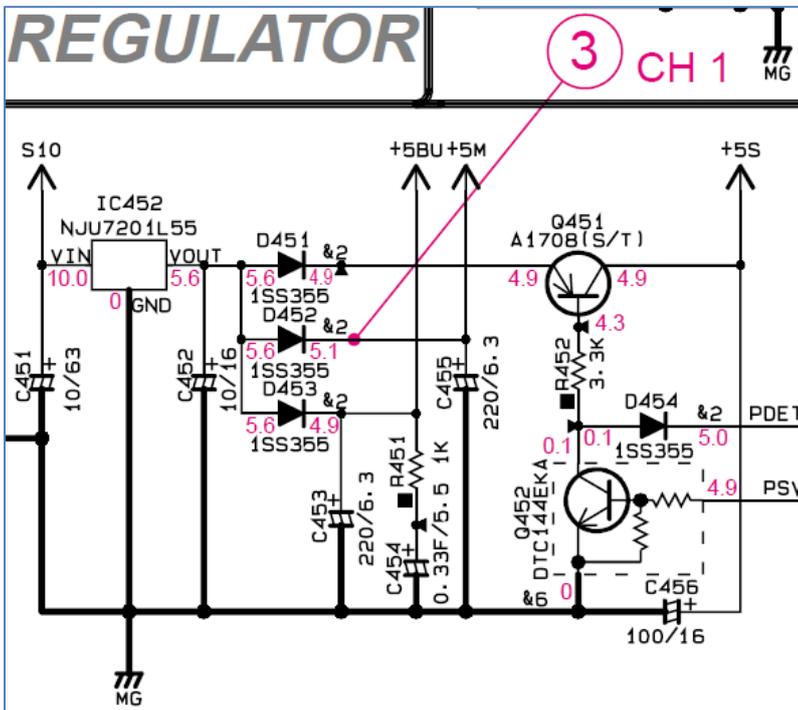
When you hit the power button it made one or two clicks, then promptly turned off. In this era of microprocessor controlled equipment, this scenario is all too common, with the user rarely given any indication as to what the problem may be.



In this case Mark had been rather active and had done some research and found the service manual online, almost the first thing in it was how to obtain error codes and how to override the auto shutdown. It was giving a display (code) of "DC:007 PS:034"

In the service manual it mentions there being an analogue port on the processor, and being able to examine all the inputs. I initially thought the '007' meant the 7<sup>th</sup> input, however you don't get to see the actual ADC values, but rather a processed version, as in Zero to 100 percent. The code I was seeing was actually two readings at once, the DC:007 one is correct, and showing it as part of the error display only confused the situation. The PS:034 was the problem child, it should be between 36 and 49, so it was just a bit low – again, another red herring. Unfortunately the manual does not state what pin on what IC this reading is coming from. So I scrolled down to the circuit diagrams, and went straight to the main micro assuming the analogue (ADC) channels were internal to it. Correct!





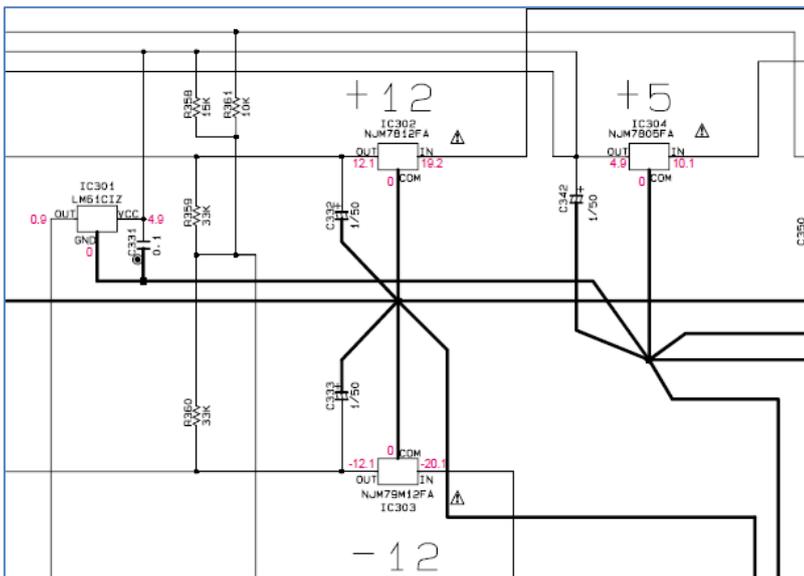
All readings were down, so I paralleled it with my bench supply and brought them all up to exactly 4.9 volts – or rather what my Fluke DMM said was the correct values.

This all had a net result of Zero.

So back to those ADC lines.

Pin 90 was at 1.6V, somewhat below the 2.1 quoted as nominal. As this was via a 1K resistor, I hit on the idea of adding another resistor and feeding in some extra current from my bench supply. I wanted to nudge it up a bit so that the processor would see '036' or above and so not see a fault.

This bodge turned out to be my best move as the processor now moved onto another fault, of 'THM:000', as in a temperature of zero. The manual says it should be between 9 and 167. So I temporarily forgot about the supply issue and went looking for the temperature sensor, figuring it to be a single device, on the heatsink, and not a values derived from many sources as the supply one was.

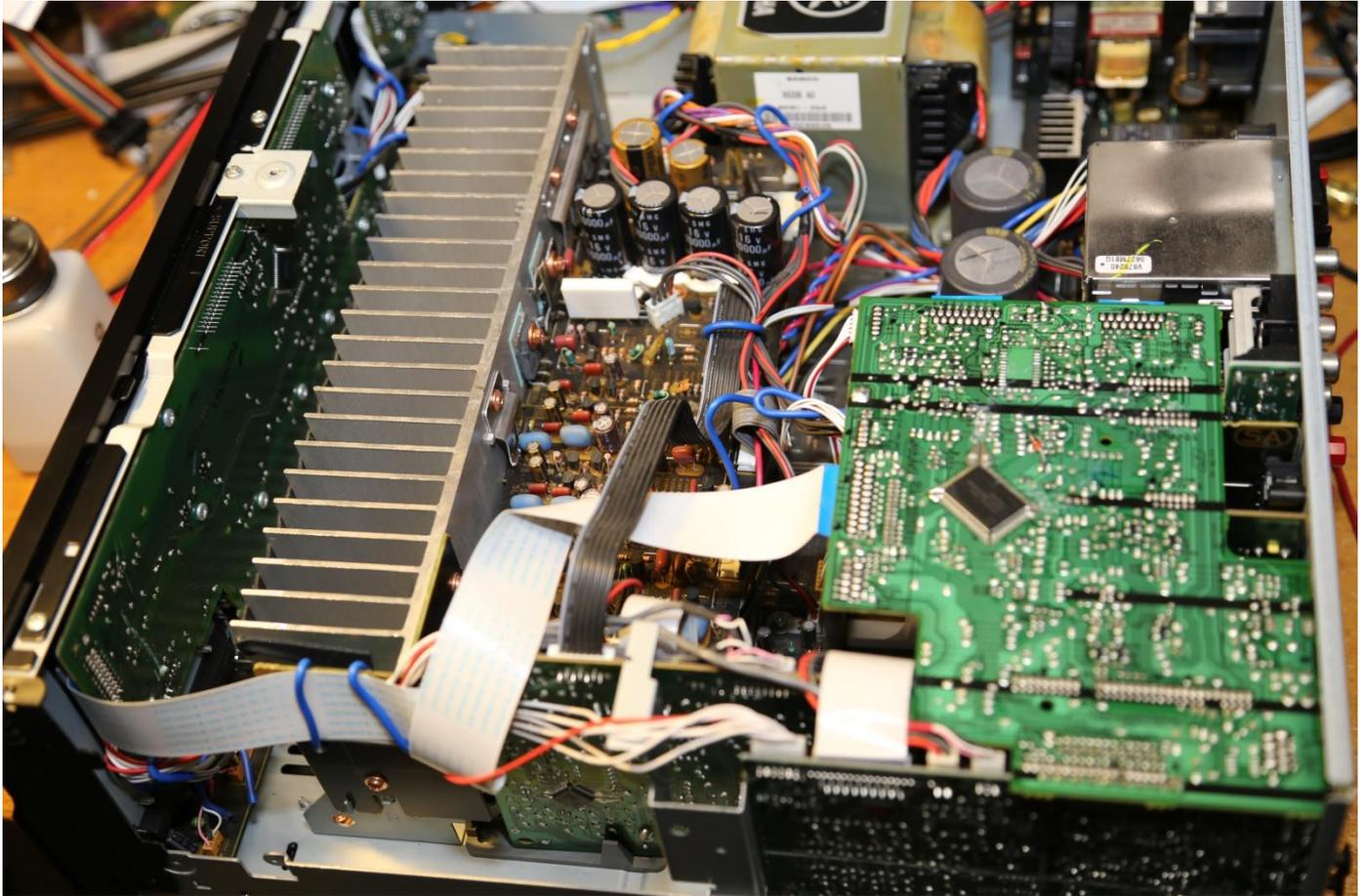


The temperature sensor is a 3 legged IC, that takes its power from a 5V regulator on the same board, one of the two boards attached to the big heatsink in the middle of the chassis, surprise oh surprise, no 5V. Again I paralleled this up to my bench supply, to check for shorts etc., and bingo everything now works.

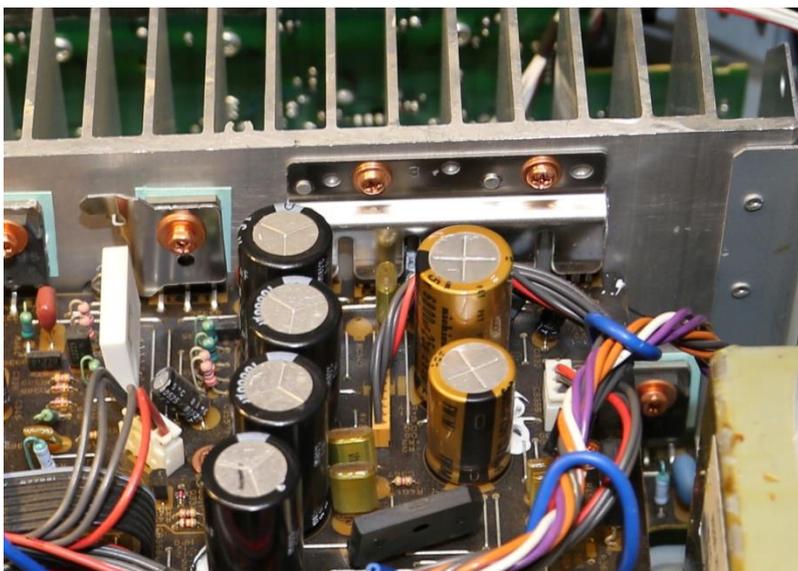
Unfortunately getting to that regulator was not easy, the whole heatsink assembly, along with the two attached boards has to be released from the chassis, then the top board has to be detached from the heatsink, as the main amplifier output board – the lower board is in the way of any soldering iron access.

So six screws to release the combined assembly, then another 8 screws to get the upper board free from the heatsink. (what's the chance I'm 'gunna mix 'em up)

The troubled reg, a good old 7805 IC was soon unsoldered, however the replacement I had had an exposed heatsink tab, whereas the original was encased in plastic (isotab), so I added a sil-pad insulator/thermal transfer pad and put it all back together.



Those isolated heatsink tab regulators are nice in that they are insulated, however their thermal performance is not as good, as plastic is nowhere as good as metal to metal. I could have left out the pad and just used some heatsink grease as both are at ground potential; however I ran the risk of creating an internal earth loop, so one sil-pad was a small price to pay.



The total loss of this 5V rail only dropped the power reading 2 percent below the normal range, not quite what I was expecting.

Pity it didn't flag the thermal fault in the first place, I would have been onto it a whole lot quicker, rather than trying to unravel Yamaha's convoluted and undocumented power supply monitoring system.

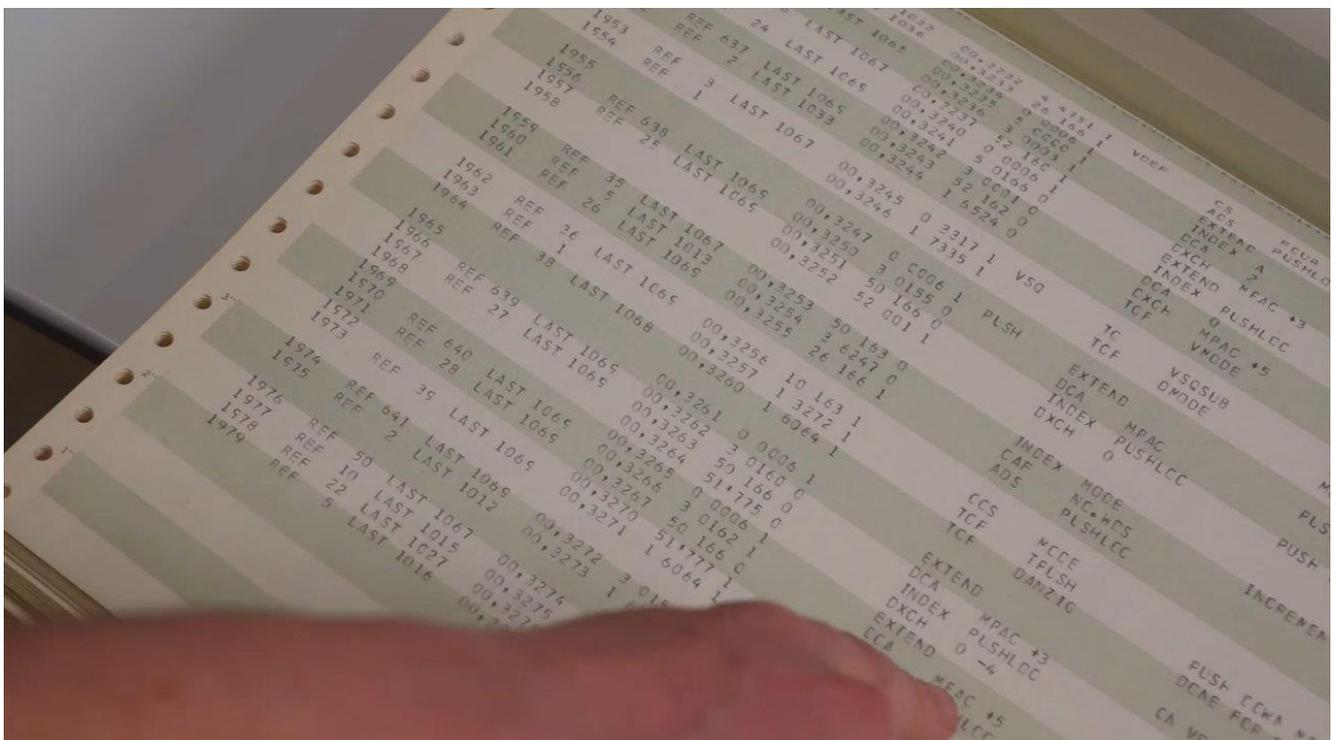
Oh well, so much for social isolation and stay at home boredom. I've never been busier.

*Paul VK3TGX*

# Interesting YouTube Videos



A brief history of electric vehicles and oil | Dan Snow & Fully Charged  
<https://youtu.be/wODCOWm4PYM>



Looking at the original Apollo 12 code listing (and the 1202 fix)  
<https://youtu.be/-y37tXoBDx0>

# Moving Message Displays



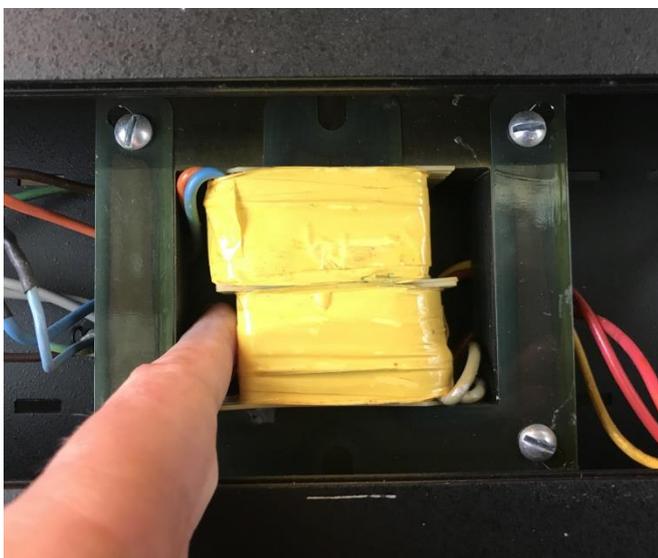
Many years ago, I acquired three LED moving message displays, this one a 'Silent Radio' made by 'Cybernetic Data Products'. The next one was made by a crowd called 'LaBelle', and finally a multi-colour unit (Red, Green, Amber) made by LUA electronics

The first two appear to have been originally supplied with keyboards, so that messages may be typed into them for display to the public etc., whereas the last one was intended to be controlled by a computer, to act as a remote display panel. These were used in Telstra at call centres to display the number of callers waiting etc., probably to add some bling as most operators would have a computer monitor in front of them capable of displaying way more than these ever could.

So why do I have them? Well I keep seeing TV shows (CSI, Air crash investigations etc.) with these hanging on the walls in the background, they look nice, so popping one on the wall in the radio shack seemed like a good idea. I have a ready stream of data doing the rounds at my QTH, so why not display it in style. Anyway, time to sort out the first one, the 'Silent Radio'



Its case is one long aluminium extrusion, with a front track for a red translucent acrylic cover, the display PCB slides in behind it. On pulling it apart I was surprised by the power supply, both a rather odd transformer, and a 115VAC to 5VDC supply, the latter having given up the ghost.



The transformer was quite odd in that there was enough space between the bobbin and the EI laminations to easily insert my finger all the way to the display back panel.

I suspect they originally had it all run, linear wise, from this transformer, then added the switchmode when problems started to arise.

The transformer has a dedicated 110V winding, feeding this USA style supply, as well as a split primary for 110/240V. Quite an unusual setup.

Maybe back in '91 when it was made, universal multi rail supplies were a problem.

Anyway, it was dead, and the transformer was all but falling out (its bolts were so ridiculously loose, one damaging the main PCB) so a complete new supply seemed appropriate.

The transformer had a centre tapped 16 volt output, that I erroneously thought was to derive a plus and minus supply for its serial port, So I went down the line of using a PC power supply. I had one that would just fit, with a plastic insulation layer as it would be all but touching the circuit boards, but then I took a change of tack and used a 12V powered PC supply, primarily intended for use in a car. I had a thought on where I intended to mount the display, and routing 12V there would be a darn sight easier than 240V. This supply accepts 6V-24V input, nice.

In a commercial environment, the sign would get hung from say a ceiling and a sparky would be called to install a powerpoint next to it, an option not really practical for me.



Here is the new supply mounted, I had a plug already made up to connect it to the sign, but I had to give it up and solder to the back of the PCB as there was just not enough clearance, even if I lowered it right down to the mounting plate, so I left it up on 6mm brass standoffs.

I was wrong about how the original transformer had been wired, there is no negative supply, as the serial port uses a TSC232 chip, that synthesizes all the RS232 serial supplies from 5V. The transformer was providing plus 9 and plus 18V, why? I'm guessing the 18V rail is being used as some form of biasing supply for that row of switching devices, visible near the end of the controller board. The 9V seems to be used to drive handshake lines on the serial port and to charge a 3 cell battery pack. (now removed) The sign is almost happy with 12V on the 18V rail, it is monitored and the sign will not start without it. With 12V it starts 80% of the time.

I'm planning on using a small isolated 12 to 5V converter to add another 5V to that 12V rail and bring it up to 17V. As for the 9V rail, 4 or 5 silicon diodes from the supplies 12V out should do the trick. A bit messy, but without the circuit diagram, a bodging I will go. After all we are only talking milliamps, 95% of the power is in the 5V rail. The back panel says 125W, maybe with all the LED's lit, but for the most part, like displaying the startup OK message, the 5V rail is only pulling 1.5 amps... I think the original switcher was good for 10A, and that LUA display I have came with an 8A supply, so my choice of a multi amp PC style supply seemed logical at the start. Talk about a wildly varying load.

Now for talking to it, I'm hoping to use an Arduino nano to convert my serial data stream to a format it can understand, failing that, I'll just rip out it's 6502 micro, and directly drive the row and column drivers with the Arduino..

Looks like I have a bit of coding to do – good, one has to keep the grey matter working. What's that saying? Use it or lose it. Lots of people are into exercise, it helps to also push the brain.



This is a keyboard from a very similar unit I found on the internet. These silent Radio units came in a few variants, mainly in the length of the display. Mine is made up of two display boards, A long and a short, so it looks like they sold quite a few variations.

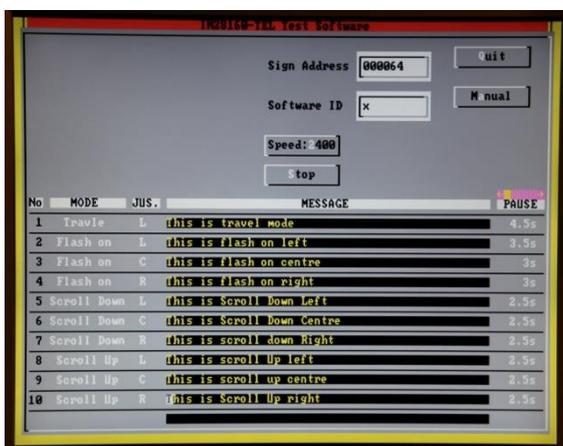
The other difference was the power supply, external transformers, however the controllers seems to have been mostly the same.

Mine uses 2400bps RS232 comms, and I was able to figure out what most of the commands are – which lines up with the list on the top of this keyboard, pity I found it after I had done all the work. Unfortunately I have not found a manual on line so many mysteries still exist.



This is the LaBelle '202 LA EXP LINK'. It runs on 9VAC, of course not supplied. It appears to use RS422 comms, however that's as far as I have gotten with it, comms wise.

A few years ago I was dreaming up some Christmas lights, and I looked at this thing and thought 'perfect', pity I could not talk to it. However by default it enters a demo mode when powered on, so I ripped out it's eprom and replaced all the demo mode messages with Christmas ones. So until I can figure it out, it's a dedicated Christmas sign.



This is the LUA unit, luckily I sourced a DOS demo program for it. It runs on 5VDC, a bad idea because at 8A it does not take much for its power socket to become problematic, to the point I replaced it with a screw terminal block. I plan to fit a 12 to 5V converter inside, that way it should be a lot more tolerant to voltage drops. Unfortunately it is a bit spotty in operation, sometimes I power it up and cannot talk to it. Maybe that's why it was pulled out of service. Maybe it's the 5V issue manifesting itself again?

Oh, I do have another curio, a very short display that came out the back of a taxi, it displays canned messages when the drives pushes an emergency duress button.

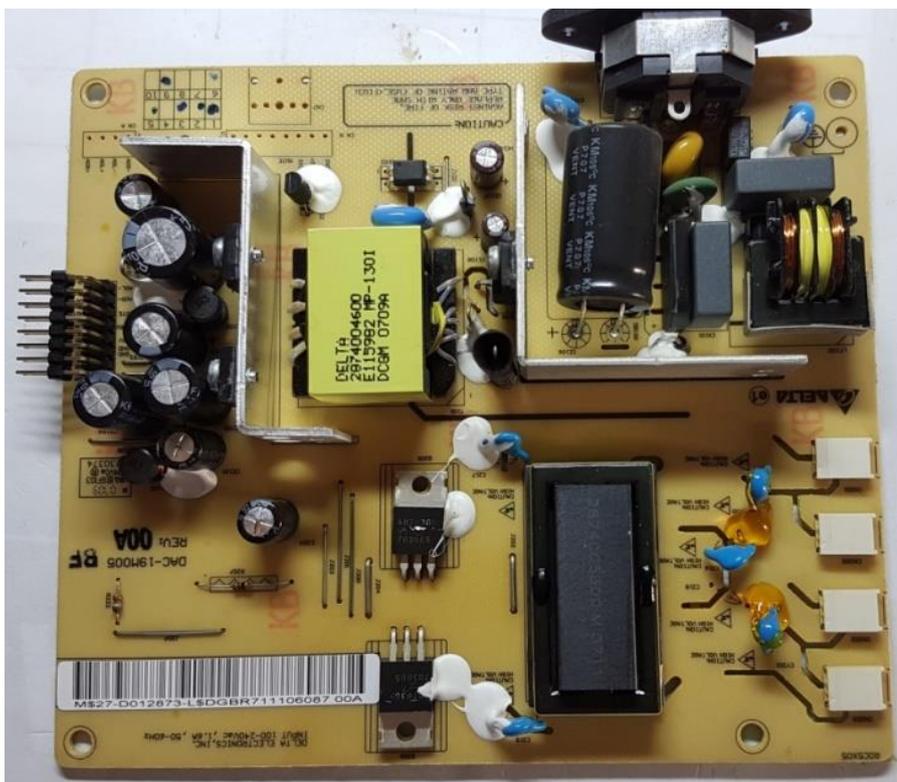


*Paul VK3TGX*

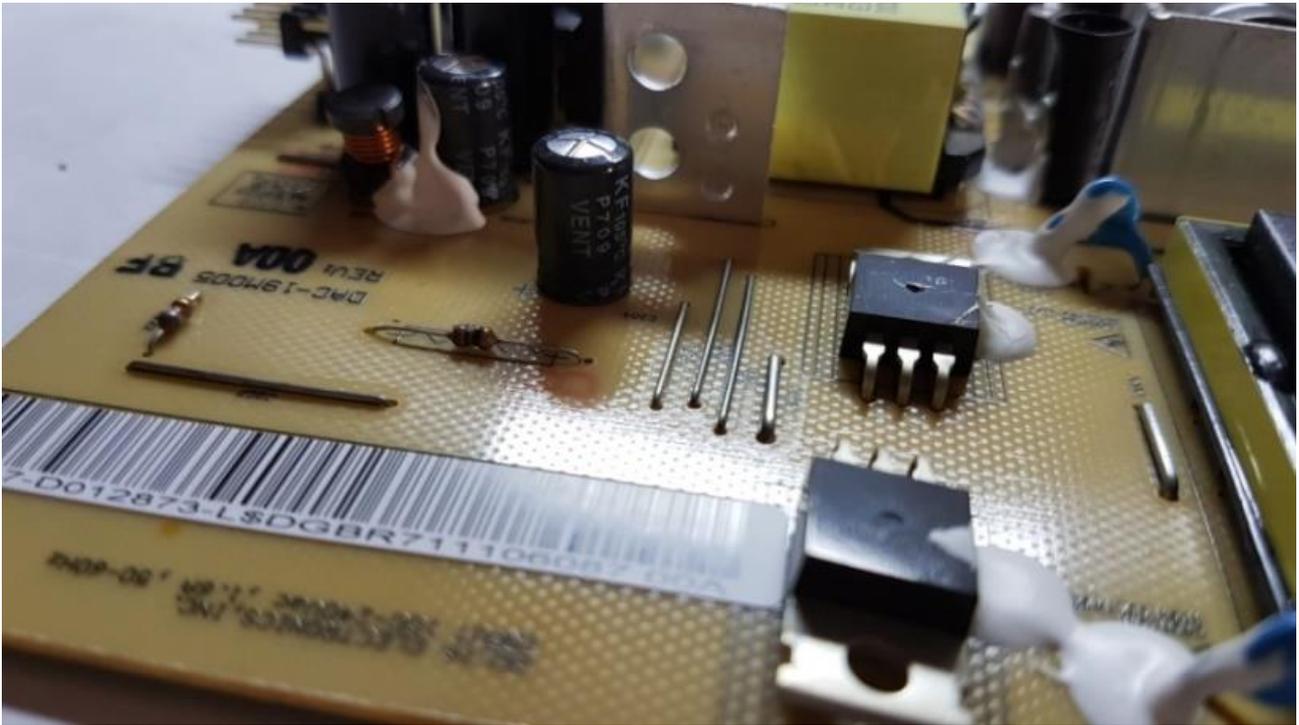
# To repair or not to repair - that is the question

A short story of a (quick) repair job.

I don't normally take photos of items that I pull apart or repair on my workbench but since Paul, our editor, said he needed articles for the mag. I thought I would repair a dead computer monitor that I had previously decided to send to E-waste rather than attempt a repair. I have a theory that spending time repairing very old equipment would be better spent doing something else and buying a new one instead. So now making the decision to "have a go" at repairing this monitor, I pulled out the camera and started clicking and unscrewing. I had said to others that it would probably only be a power supply problem so how difficult could it be?

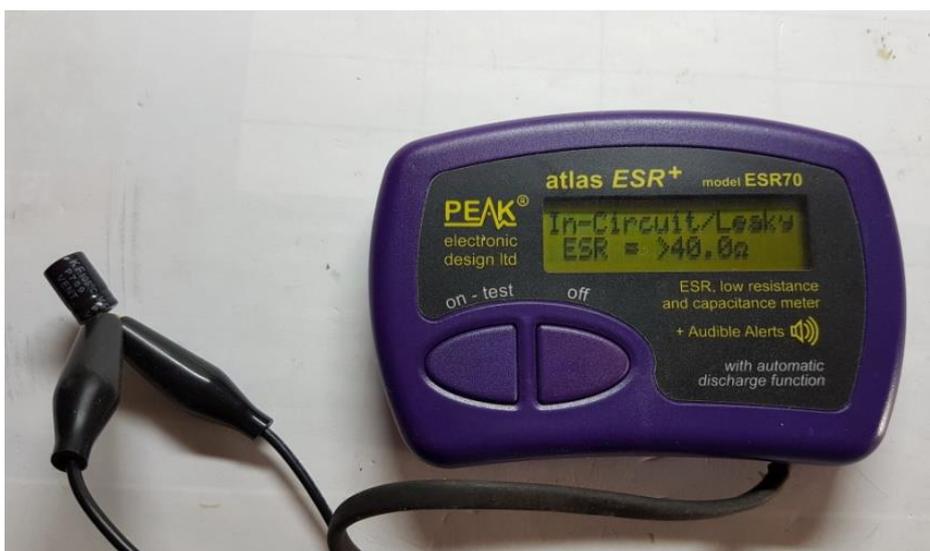


Dismantling the case was not that hard as it was clipped together with plastic tags. Once the insides could be seen, the power supply was easy to get at. From the photo, it is obvious that as per usual with most faulty switch mode power supplies, some of the electrolytic caps had decided to vent themselves. (look for the ones with the tops bulging)



A few years ago I purchased an ESR capacitor tester which most times will work in circuit so long as the capacitor being tested does not have a high voltage charge on it. Things being rather obvious in this case, I removed the mounted parts and took pics of the test results.

For the uninitiated, ESR stands for Equivalent Series Resistance (or sometimes Effective Series Resistance) and is a measure of the resistance introduced into the circuit with the capacitor at certain frequencies. Without going deeply into the working of switch mode power supplies, due to the frequency of oscillations called ripple current present on the output voltage, a high ESR prevents proper filtering and allows heat buildup as well. (That is a very short description of why a low ESR is desirable because that is not the aim of this article)



Keeping a good range of Low ESR capacitors in my kit, I pulled out replacement items and just for demonstration purposes took pics of them on the tester as well. The pics tell the story.



While I had the tester out, I also tried some ordinary caps that I have in storage. Once again the pics tell the story but it is interesting to see that standard caps were almost as good as Low ESR types but without testing them first, you could end up installing one like the grey one that was marked 220uF 16v but measured 324uF but had a nice low ESR.



So happily deciding that I had changed all faulty parts and in record time too (1 hour thus far), I plugged in the board and turned the power on. Unfortunately it was not going to be that simple so out came the multimeter to test for voltages.

Well to shorten the story in a very quick way, I got too cocky with the test prod and shorted out something that should not be shorted out and it told me so by letting out its stored smoke.

*(Next time, please put your camera in Video mode - Ed)*

And so we come to the summary of this article which goes like this.....

If a piece of equipment is so old that it isn't worth repairing - don't repair it. If I had valued my workbench time at say \$80 per hour and I spent about 1.5 hours including clean up time on this non repair, then I could have bought a brand new equivalent monitor for just a few dollars more.

Who said we don't have a throwaway society. E-waste wins again.

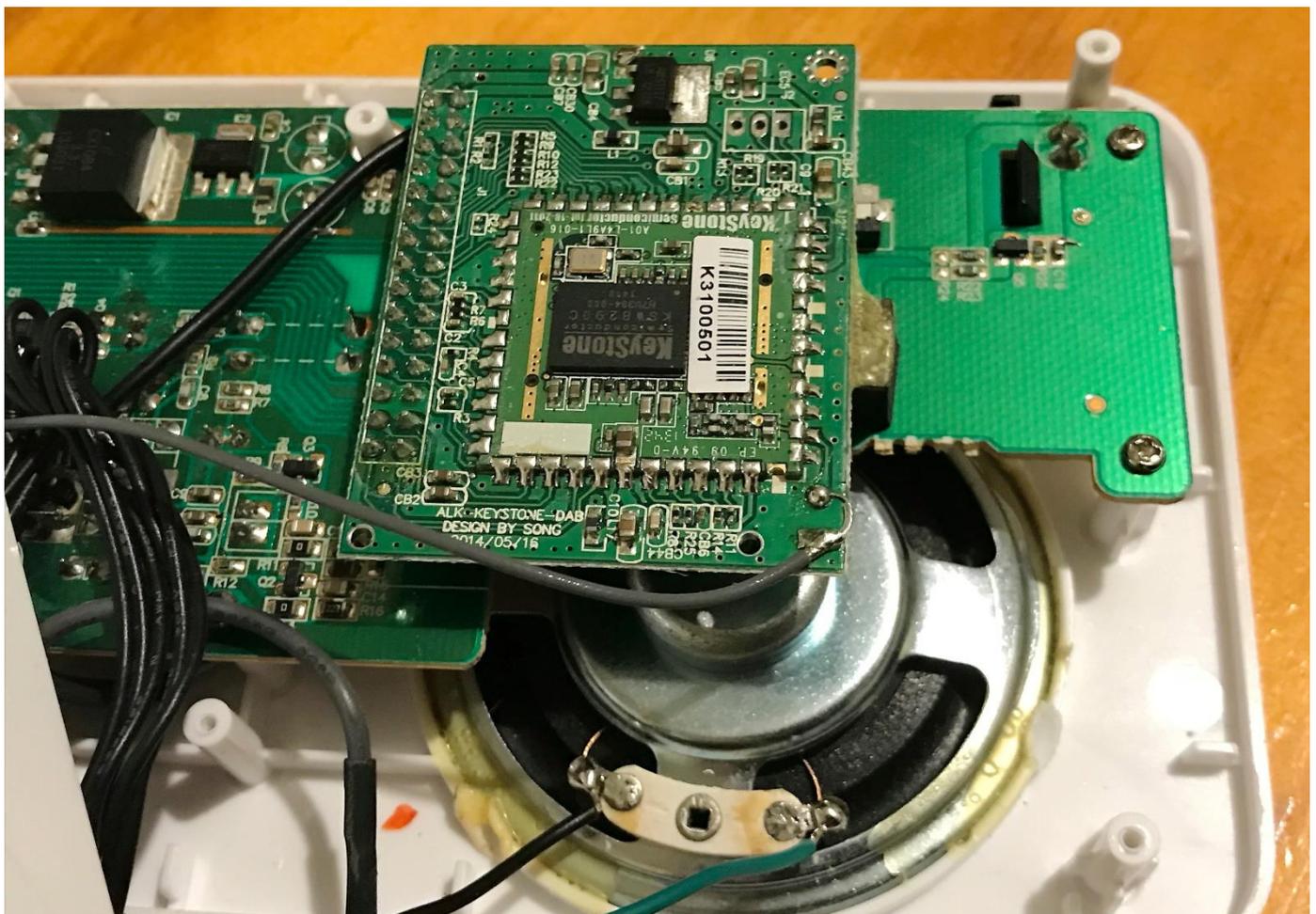
Oh and by the way, I did not take a pic of the smoked parts; I just tossed the PCB out the door.

Albert VK3BQO

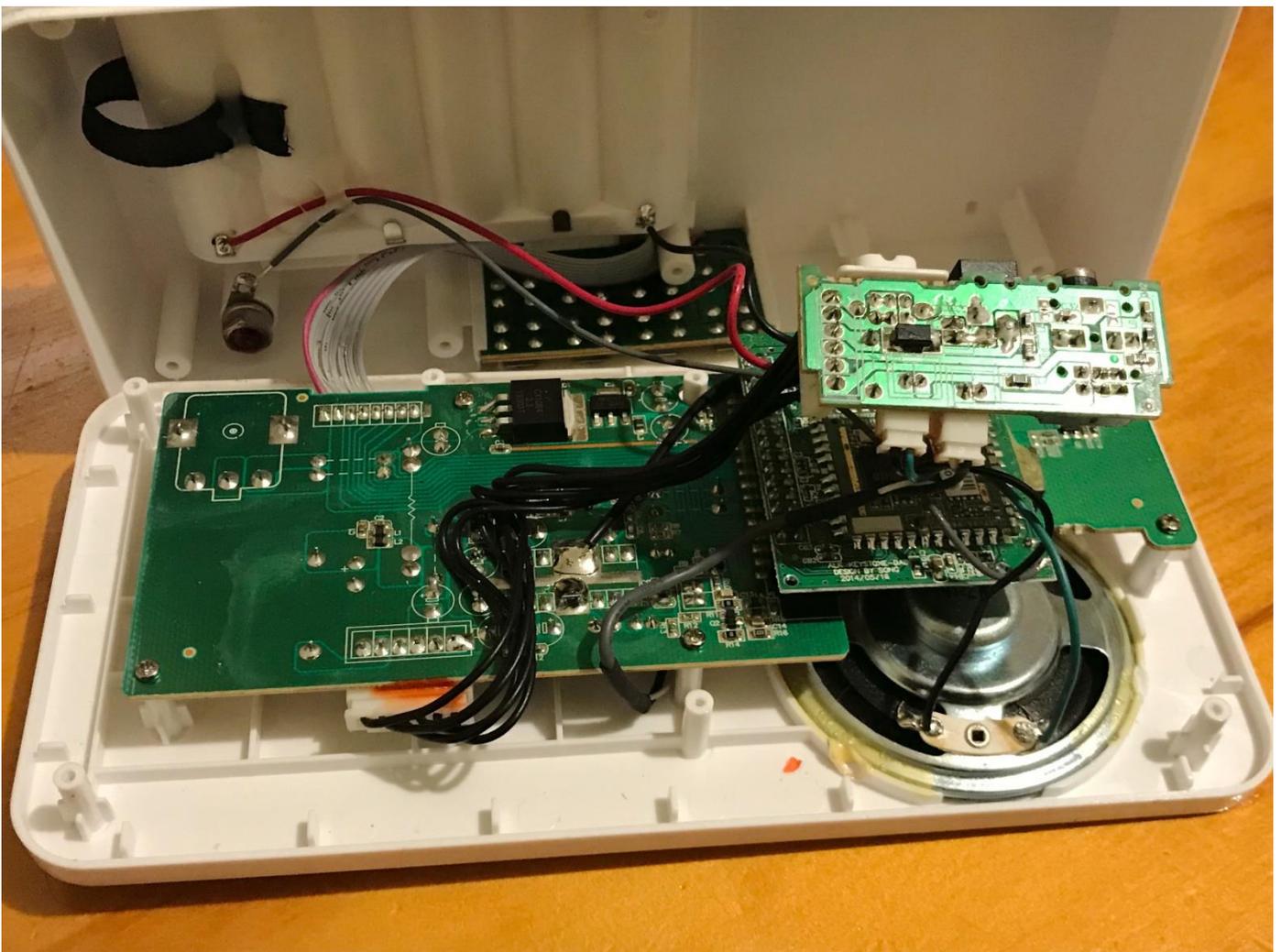
# Digital Radio Looksee



I was given this DAB+ digital radio for repairs, as it's innards are quite a lot different from the usual AM/FM sets one encounters, I thought the readers may be interested in a looksee.



No tuning capacitor, antenna coil, or IF transformers in here, it's all in that Keystone branded chip on that daughter board, on a daughter board – A bit of a stacking theme going on here.



Another view, unfortunately I could not easily get that connector PCB out of the way, its leads were too short, and the plugs glued in. (The glued plugs were not broken, so don't 'fix' them)

If I hadn't seen the front panel, I'd be hard pressed to figure out what the device was from this angle, there's a bit more than you'd find in a Bluetooth speaker, but not much.

Most of the smarts are in that daughterboard IC, the main board also has an IC (micro?), but that is tasked with just driving the display. I didn't dig that far, I just fixed the fault and left it at that, going further usually tempts fate.



As for RF bits, there is precious little of it, a miniature coax brings the RF up to the daughter board, through a very rudimentary circuit (Filter?) then straight into the main IC, probably to be immediately digitized.

These sets also do FM, I'm assuming purely in software, so I should try some audio distortion tests on one of these, it'd be interesting to see if it does a better job than a conventional superhet design.

Oh, and the fault? Broken solder joints in both the DC power in jack & an inductor busted off the PCB in its 8V plug pack power supply.

*Paul VK3TGX*



# Club Information



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

All physical meetings suspended due to the coronavirus restrictions

## Office bearers

|           |                |         |                  |              |        |
|-----------|----------------|---------|------------------|--------------|--------|
| President | Tony Doyle     | VK3QX   | Web Master       | -            | -      |
| Admin Sec | Rob Streater   | VK3BRS  | Magazine Editor  | Paul Stubbs  | VK3TGX |
| Treasurer | Robbie Xin     | VK3FAMT | Property Officer | 'committee'  |        |
| General 1 | Helmut Inhoven | VK3DHI  | Assoc. Secretary | Rob Streater | VK3BRS |
| General 2 | Leigh Findlay  | VK3FACB |                  |              |        |

## Call in Frequencies, Beacons and Repeaters

The Club Station VK3BJA operates from the Cranbourne Clubrooms.  
 6m Repeater Cranbourne VK3RDD, In 52.575 Out 53.575 CTCSS none  
 70cm Repeater Cranbourne VK3RGW, In 434.475MHz Out 439.475MHz CTCSS 91.5Hz  
 VK3RGW Repeater supports Remote Internet access (IRLP), Node 6794.  
 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

- 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](mailto:editor@ggrec.org.au) Cut off, 10<sup>th</sup> of the month  
 All other Club correspondence to: [secretary@ggrec.org.au](mailto: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](http://www.ggrec.org.au)  
 Website errors, contact web master: [webmaster@ggrec.org.au](mailto:webmaster@ggrec.org.au)  
 Facebook Page [www.facebook.com/GippslandGate](http://www.facebook.com/GippslandGate)