



GATEWAY

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

August 2017



**GGREC Hamfest 2017
Hamfest in Pictures
Transistor Sound
And More**

**President's report
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Event Queue

August:

- 18th General Meeting
- 19th 20th ILLW the 3rd full weekend in August since 1998
- 26th ALARA Contest, Start Time 16:00 - A 24 hour Contest for YL's
- 26th FISTS CW Contest 1000 – 1159 UTC

September:

- 1st Prac Night – Club rooms
- 8th - 12th IARU High Speed Telegraphy world championships
- 15th General Meeting

PRESIDENTS REPORT – August 2017

The 2017 Hamfest Sale is over... One less thing to worry about. We did good, with profit just over \$2000 for the day. Attendances were reasonable, weather was kind and lots of people enjoyed themselves yet again. A big thank you to Pat for organising the kitchen, along with Dorothy, Helmut, Graham. And to Bruno and Albert and Graeme for hall setup and seller management. To Brian and Nils for preparing all those showbags and of course for Dianne for taking 40 table bookings over the past months and selling the door tickets with Ross & Hal. I'm sure I have missed the names of many others who contributed on the day, but yet again the team effort by our Club was as seamless as a Nullarbor Plain train track*. Just on 200 snags were sold at our outdoor barbecue, which was a pretty good result too.

As in the past, Paul VK3TGX took lots of images from around the room. These can be seen on the Club's website Gallery page at: http://ggrec.org.au/gallery/categories.php?cat_id=254

MarkVK3PKT set up a great time-lapse video of the entire event from the stage. This clip is worthwhile taking a look at: <https://www.youtube.com/watch?v=PLsUlpcX7s>

The image here shows the many visitors waiting with bated breath for the Door Prize results.



For the record, these prizes were won by:

1. Peter, VK3MV
2. David, VK3DLR
3. Paul, VK3PG
4. David, VK3FW
5. Margaret

First prize was a compact gas soldering kit.

our regular General Meeting followed by an 'Open Mic' session (metaphorically speaking because there may not be an actual microphone) The topic of discussion is about the WIA, but this is to be a positive forum to try and gauge opinions as to what is desirable for the WIA to be doing for Amateur Radio in this country. Both WIA Members and non-members should voice their ideas. Where a consensus of opinion exists, these ideas may be forwarded later to the WIA for their collective consideration.

Last Prac Night we had a 'What You Need To Know' session on the basics of using the Yaesu FT950. A copy is available here: <http://ggrec.org.au/Downloads/WYNTK-03%20FT-950.pdf>

Next Prac Night, on the first Friday of September we will go with a retro introduction to using the **TS-520** the Club's other HF rig from the 70's. (The section on memory settings will be much shorter)



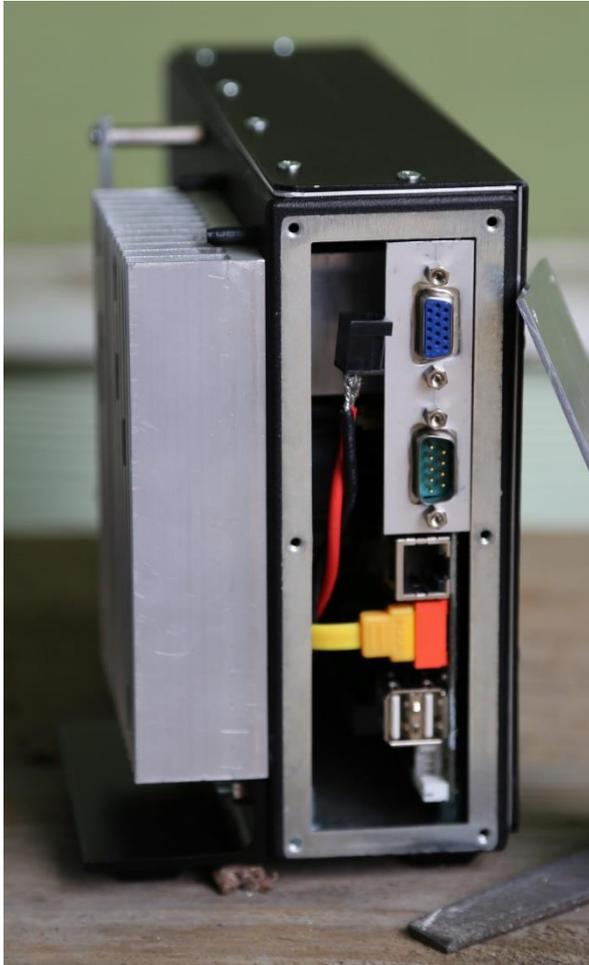
The famous Kenwood TS520

See you at the General Meeting, 8:00pm This Friday Night

* *The Nullarbor Plain sounds like a good Aboriginal name, but really it's Latin. Null Arboretum, meaning No Trees. Who'da thunk it?*

From The Editor

August already!, So what's been happening in the 'TGX shack? In my 'spare time' whilst being close at hand for Marianna (Her knees are shot) in the laundry (opposite end to radio shack), I've been slowly piecing together an old IEL industrial PC board into the remnants of a case, all retrieved from the skip at my previous employer. Many missing parts being fabricated from aluminium sheet etc. The board and case have been kicking around for a while, so I decided I'd work on it during the 10 minutes visits, that would otherwise have been spent SWLing.



I had 'scored' a small pile of these industrial boards, one almost ended up controlling the club shack door access system, except the ancient software was unhappy for some reason.

These boards are usually fitted into a custom box as part of a larger piece of equipment, and don't get used as general purpose computers. (Quite often with no screen or keyboard) When they break, and come in for repair, if it is the computer board, it is simply swapped out for a new one, almost no effort is made to repair them, after all, given the price of the device they are out of, the hourly rate of the repair technician, and the costs of re-installation to where it came from, the board is worth nothing. If a repaired board is proven still NQR, the ramifications and costs can be very significant. In this case, they are on the side of a road, quite often a major road, needing the road to be partially closed – both to retrieve, then replace, i.e., \$\$\$\$\$. (& bums kicked)

These boards have a 3V lithium battery, and these I have found to be a major culprit. If they go completely flat, no problems (well, almost). No, it's the 'grey area' between flat and good enough. As

they go down, bits in the CMOS configuration memory slowly start changing, unfortunately, the boards BIOS cannot spot these small changes that have occurred (yes, they SHOULD have checksums etc., but they don't). So when it gets reset next (usually from a power fail) the system comes up 'dead', with a configuration that has the BIOS in knots, stuck in a loop trying to do the impossible. I.e., no HDD boot, no error beeps, blank screen and no keyboard response. A 'keen' repair tech will fit a new battery, but all that does is to safely save all the corruptions, it still will not boot. The usual fix, I have found, is to remove the battery, all peripherals (Hard drive etc.) and put the board aside for a decent period, so the CMOS memory gets sufficiently cleared that the BIOS can make sense of it. Then after several reset attempts, while pounding on the 'delete' key, you hopefully end up in the bios screen and can tell it to use the 'safe defaults', then save that and reboot again. After all that, then try connecting a battery & hard disk etc., and try for a normal PC boot-up sequence. It's almost an art, rather than a science; hence most take the easy (and much faster) route and fit a new board.

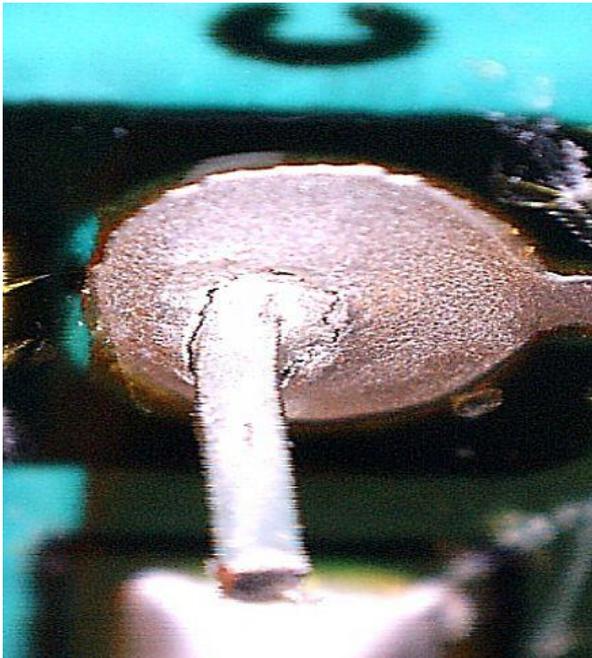
I'm not complaining, more toys for me.

Paul VK3TGX

DEALING WITH BAD JOINTS – Ian Jackson, VK3BUF

Dealing with dry joints can be a problem. I don't just mean some old doobies stashed in a drawer for too long, I mean the other kind that stops your appliances from working the way nature intended them to work. A few months ago I was handed a large screen TV to 'have a look at'. (Sometimes I don't hide fast enough and they find their way to my door.) This one was a big-un and apparently a favourite of its owner, except that it would frequently reset itself with the slightest vibration in the room. It was a \$1000 bit of hardware destined for the nature strip if I couldn't find the problem, so I removed the rear cover and exposed its guts to the light of day. Sure enough, any more pressure than a vigorous cat sneeze was enough to reset the unit.

It was 'probin time', so with the plastic end of a small paintbrush, I progressively tapped and squeezed away until I localised the fault to a small area of the board. Even then, I could not see what was going wrong.



This was the cause of a lot of agro to the owner

Out came the little Jaycar USB microscope for a closer inspection. This made the difference and I found that one little solder pad, about 2 millimetres across had a crack around it.



The trusty USB microscope

It was very difficult to see, but the lightest touch of this pad with a plastic probe would cause a complete TV reboot.

A quick re-melt with a soldering iron and the problem went away. It highlights some of the limitations of modern manufacturing. These appliances are built to EU standards where lead-

free solder is the norm. However, this solder is pretty awful to work with in production. It must be heated to a higher temperature 220° C instead of the 180° of traditional lead alloy solder. This means that the flux fizzes and spits at the technician and it cools with a frosty matt-finish, making it hard to see the defects. With the classic tin-lead solder one of the hallmarks of a good joint is a nice shiny finish and I still prefer to use it whenever I can.

The lead-free solder is also called Pb-free, where Pb is the abbreviation for Plumbum, the latin word for Lead. (Hence Plumbers get their name because originally they worked with lead pipe, or at least until they worked out that lead water pipes were killing everyone.)



Getting the lead out...

To wrap up this little article, I bring you an extract from the Jaycar website, where it seems that mathematics is an optional skill. (*\$50.95 with a \$5 discount does not equal \$54.95 guys!*)



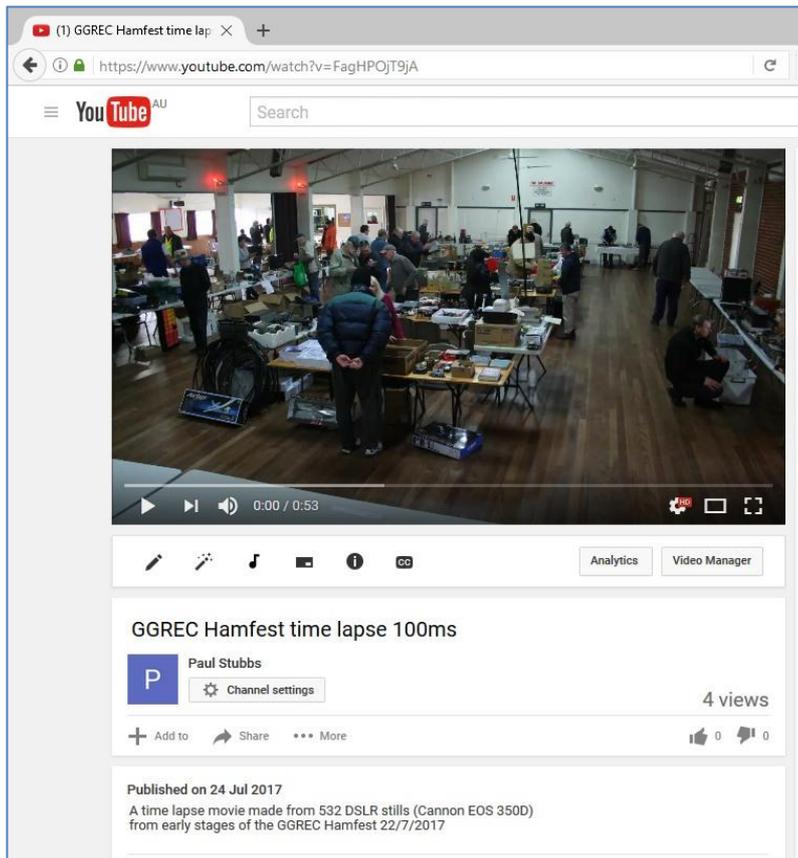
Lead Free Solder 1mm 500g Roll

99.3% tin, 0.7% copper lead-free. Sizes for every application from hobby to industry.

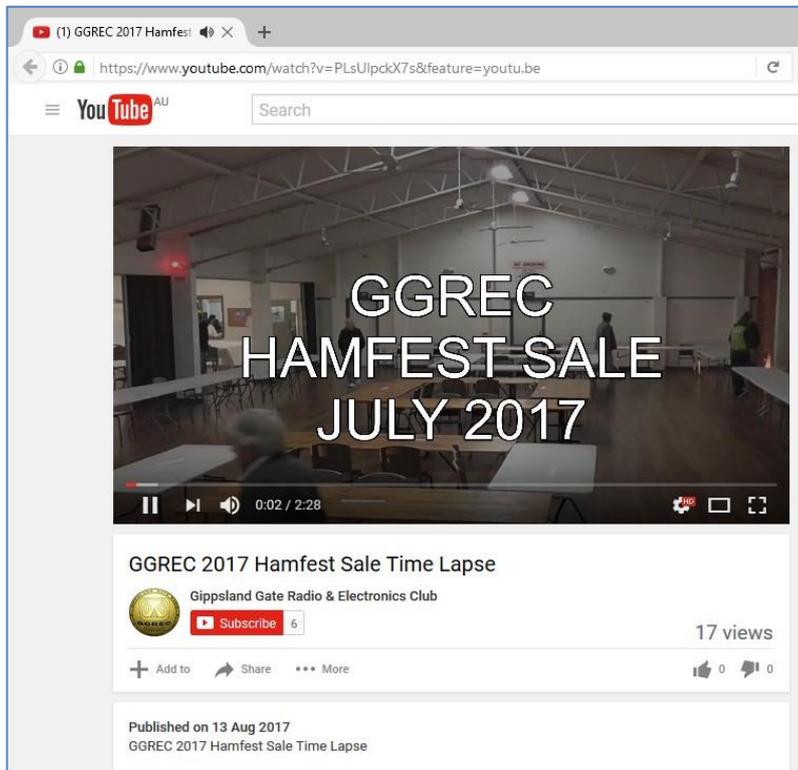
- 1mm 500g Roll....

	\$54.95
	WAS \$59.95 Save \$5.00
Bulk Pricing:	1-2 \$54.95
	3-5 \$49.45
	6+ \$43.95

GGREC HamFest 2017 - Time-lapse



<https://www.youtube.com/watch?v=FagHPOjT9jA>



https://www.youtube.com/watch?v=_ePD29qr5H8

A while ago, someone mentioned the idea of setting up a camera on a tripod and doing a time-lapse video of the hamfest.

My 'second' DSLR camera, a Cannon EOS 350D does not get that much work these days, so I set about making a shutter timer that would take a picture every 5 seconds or so.

I thought of using one of the Arduino nano boards I have been using for many projects, but ended up going for the good old 555 timer.

Unfortunately the camera had been loaned to my brother, and I didn't get it back till the day before the hamfest, so the build was a rather hectic affair after the Friday night meeting, the day before the hamfest.

I should probably have reduced the picture resolution, as the 2 GIG CF card in the camera ran out after 532 photo's, mind you that gives almost 4K resolution, but only for a short time.

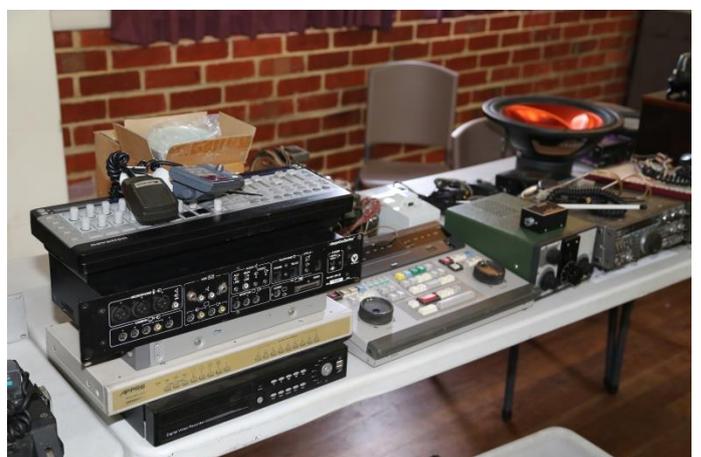
Mark, VK3PKT also set up a camera, but he had the framerate set to one every 30 seconds, that and a bigger storage meant his camera lasted the whole day.

His, a proper video camera, directly supported time-lapse, so no late night soldering was involved.



Paul VK3TGX

GGREC Hamfest - in pictures





Hamfest 'Bargains'?



One of the almost standard features of a hamfest is the last minute bargains, as stallholders start to realize they are not going to sell their "junk", and the visions of loading it back into the car (or fessing up to their partners about their failings) is just too much, so its "Bargain time", or is that "Freebee time", a reason to hang back.

I ended up with this HP Digital to Analogue converter. What, a big name D/A for free, there has to be a catch.

After much head scratching I finally figured out this D/A's place in the great scheme.

It was used to convert the output of a digital instrument, like a frequency counter (not much point converting a DMM output!) to a signal that could be fed into a chart recorder.

This device is from the era before computers were cheap and readily available, so if you wanted to see how a signal varied over time (maybe when you are not looking), a chart recorder was the only option, and this box was the missing link between the two. It is only capable of converting 3 BCD (Binary Coded Decimal) digits to analogue (More resolution than necessary for most recorders), the column selector switch choosing which 3 digits to use from an instrument with up to a 9 digit display. Hence there been three index markers on the knob skirt, rather than the regular 1.



I probably shouldn't fess up to taking this one home, However I had recently been looking around the web for "ancient speakers", and the woodwork on this one reminded me quite a bit of what I found.

(It looks better in the flesh – believe me)

Unfortunately, the original owner's woodwork prowess did not extend to the innards. The chassis is from an old radiogram, no surprises here. However the case has been built with little regard as to what needs to be fitted inside to make it all go together, only suiting the dimensions of the front

escutcheon panel. After fitting the front panel, when it came time for mounting the radio's chassis, he must have thought "mmm - I know, Silicon sealant will do the job."

Now for the speakers, let's see, I'll rip 'em out of this old cassette radio – 3.8 ohm, what does that mean - technical gibberish, they are speakers. – Oh dear they won't fit, Stuff it, where's my hammer.

Blast (as he puts the hammer through one of the cones), time for some more silicon.

Technical appraisal – Audio equivalent to an microscopic elephant on heat, intelligibility **ZERO**

Price paid ... (oops too much info already)

Paul VK3TGX

UPDATED CLUB LICENSE VK3BJA – NEW RULES?

Last month we received an official ACMA update of the Club station license VK3BJA which included a clarification (highlighted in yellow) of how the Club station may be used with different classes of license. That's all fine and good. What we did not expect is a WTF artefact which was inserted as the following paragraph, shown below in the sketched circle.

Special Conditions applying to licence no.: 193855/1

This Amateur station is a club station and must be operated in accordance with the Radiocommunications Licence Conditions (Amateur Licence) Determination that equates to the qualifications held by the operator of the station.

(F) At least seven days before the first transmission the licensee shall place advertisements in each daily newspaper circulating in the city where the transmitter is located. The advertisement should give details of the date and time of commencement of the transmission, the duration of the transmission and the frequency and channel to be used; and state that the service may not be available throughout the metropolitan area; and explain the content of the service and the temporary nature of the transmission; and give details of the television reception equipment needed to receive the transmission;

The licensee of a club station shall keep a log book in which must be entered: (a) a chronological record of all

Preceded by an ominous (F) it looked like a chunk of miscellaneous text had fallen from a black hole and landed in the middle of our license conditions. It does seem a bit draconian that our little Club has to take out big adverts in all the Melbourne newspapers a week before we prepare for any Club Net or DX contest.

Ok so what's going on here?

Google is pretty good at finding stuff, so I re-typed much of the first sentence into the Search Engine and hit the go button.

What I found was a link to a very different ACMA document.

Our strange little item has leapt from a five year old docx establishing the conditions for 3D Television trials.

To be fair, the paragraph did pretty much leap from the screen.

Hence the first part of this document is reproduced here from sheer curiosity.

The wayward paragraph 'F' has been highlighted in white.

Still, there are no clues as to why this contumacious bit of text found its way into our official Club license five years later.

It's all very Douglas Adams...



Licence conditions for 3D TV trials – 16 July to 13 August 2012

- A. The station authorised by this licence must not be operated for purposes other than trials of the new radiocommunications technology of 3D (stereoscopic) television broadcasts.
- B. The licensee shall not cause unacceptable interference to an analog television service, digital television service, or digital radio broadcasting service, within the meaning of Part 6 of Broadcasting Services (Technical Planning) Guidelines 2007. The licensee will identify and rectify any unacceptable interference that has occurred as a result of the transmission throughout the period of the duration of the licence.
- C. At least seven days before the first transmission, the licensee shall have established a transmission hotline (the hotline) in a form of a telephone number that can be used to make enquiries or complaints about the transmission service, television reception equipment performance and interference from the transmission. The hotline shall be available to the public at all times throughout the period of the duration of the licence.
- D. During the period of no less than seven days after the commencement of the transmission, the licensee shall conduct test transmissions in accordance with the technical operating specifications that the licensee intends to apply to the transmissions after the testing procedure is complete. During this period the licensee shall undertake any necessary further planning so as to eliminate or minimise all interference to services provided by radiocommunications licensees caused by the test transmissions that is identified during the test transmissions and eliminate or minimise the harmful effects of the test transmissions on the performance of television reception equipment.
- E. The licensee shall investigate each complaint that it receives throughout the period of the duration of the licence from the hotline or through any other means, relating to interference or television reception equipment malfunction caused by the transmission and perform necessary actions to resolve the complaint.
- F. At least seven days before the first transmission the licensee shall place advertisements in each daily newspaper circulating in the city where the transmitter is located. The advertisement should give details of the date and time of commencement of the transmission, the duration of the transmission and the frequency and channel to be used; and state that the service may not be available throughout the metropolitan area; and explain the content of the service and the temporary nature of the transmission; and give details of the television reception equipment needed to receive the transmission; and state that members of the public should contact the licensee if the transmission causes interference to other services provided by radiocommunications licensees; and state that members of the public should contact the licensee if the transmission affects the performance of their television reception equipment; and include the contact details of an appropriate person; and provide information about the hotline; and provide the address of the website referred to in condition H(1).

Transistor Sound

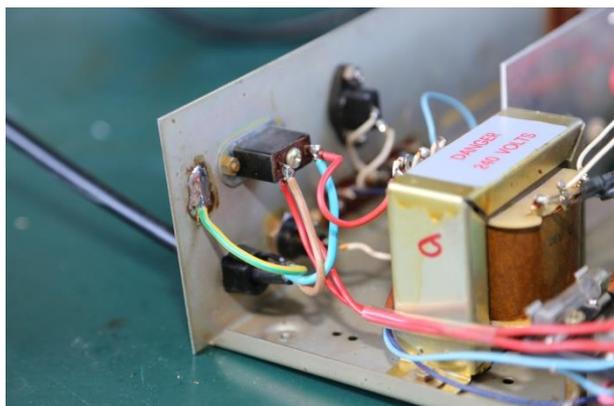


Years ago I heard all about “Transistor sound”, or was that Transistor noise, and how terrible these new solid state amplifiers were, stick with valves was the cry by the golden ear brigade.

I was born at the end of the valve era, and frankly anything that wanted to kill me, was to be avoided, so I was happy to skip the 200+ volt HT supplies of the era, and stick with transistors.

By the time I had grown up and could afford a HiFi system, the art had advanced enough that I never really knew what transistor sound was – that is apart from nasty miniature tranny radio’s.

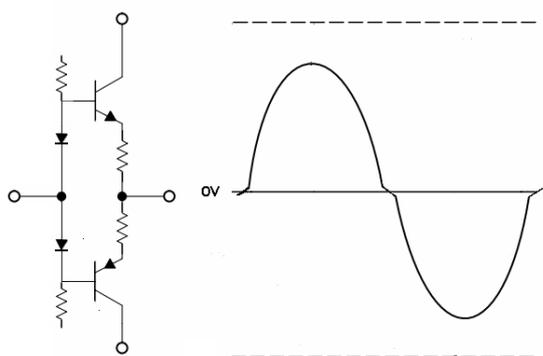
Recently, a colleague from church dropped off this ancient Diamond brand amplifier that he picked up at the tip shop? All it needed was a new power cord. I’m not sure how the original cord was anchored, as all that was left was half a rubber grommet, no clamp etc.



So after doing some panel bashing to fit a plastic cable clip, and soldering the earth wire to the sheet metal chassis (Boy was the original joint dodgy) it was time to give it a run. – Yuk

Apart from several other faults, the basic sound out was terrible, I then remembered all those tales about transistor sound.

So for comparison purposes with something of a similar vintage, I dug out an old Linmark valve stereo amplifier. This amp uses a single ended configuration using ‘modern’ miniature valves; I think you’d be lucky to get 5W a channel, about the same as the Diamond with a single 20V DC supply. The first thing I noted (surprise surprise) was the Linmark was so much quieter.

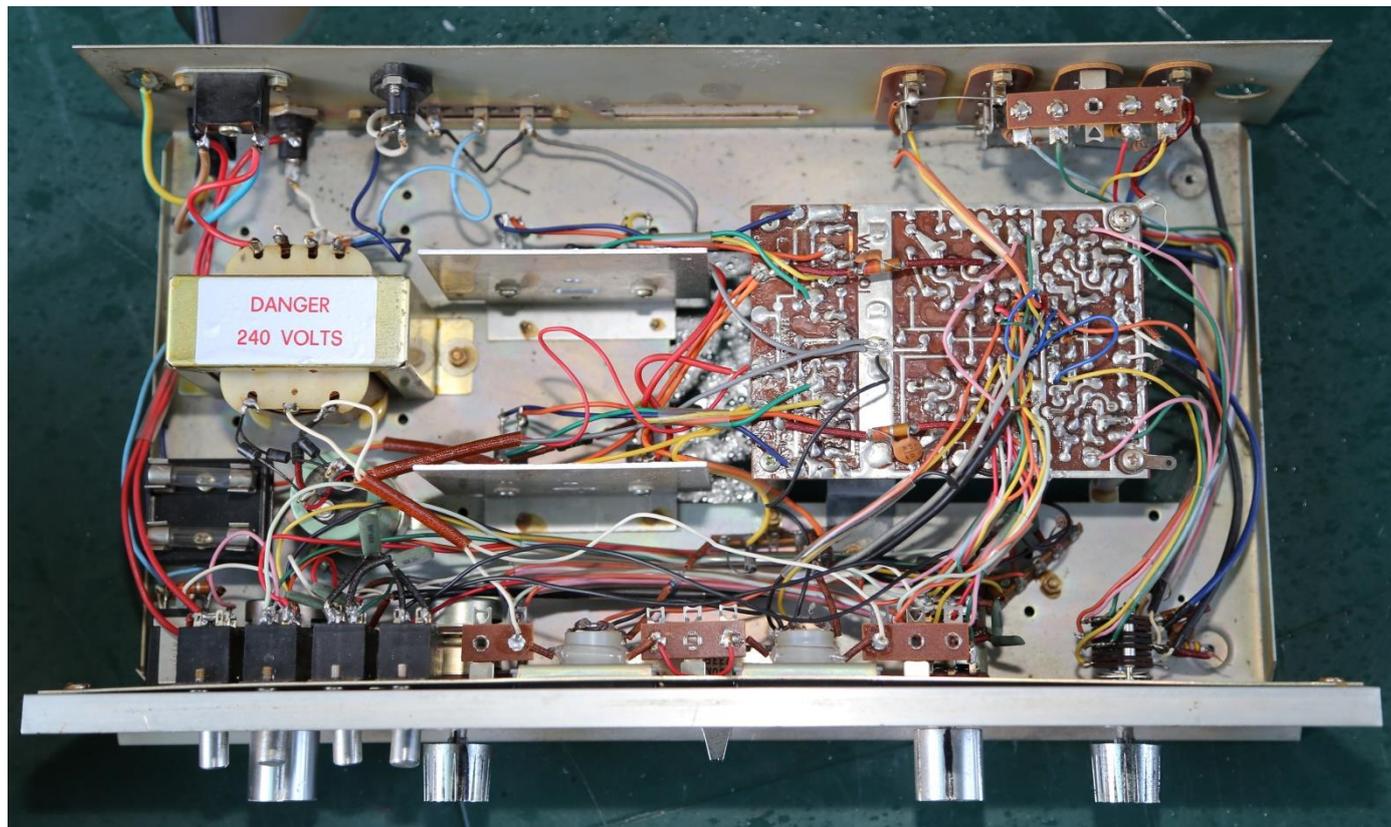


One of the first suspects in transistor amps is crossover distortion. As the signal passes from one polarity to the other, one output transistor cuts out and its mate takes over. On a valve amp, this process is quite smooth, and you kind of have to go out of your way to get it wrong, however with a transistor, the cut-off is a lot more abrupt. You have to make a lot of effort in controlling those output devices so you don’t end up with a crossover ‘bump’ in your

signal. Another problem, alluded to often in ‘Silicon Chip’ magazines is the earthing and routing of signal lines. Everything is low impedance, with high currents, so voltage drops and high current lines inducing signals into other lines abound. Quite a while ago they did a re-design of the old ETI 480 amplifier, and they achieved quite marked improvements in distortion figures

just by getting the track layout right. In the article they also specify how the wiring is to approach & leave the board, for fear of inducing a non-symmetrical signal into a sensitive part.

Graeme VK3XTA had a job fixing an old church PA amp; he simply gutted it and fitted one of these Silicon Chip SC480 amps, and was rewarded by comments that the sound system sounded so much better! http://archive.siliconchip.com.au/cms/A_30285/article.html

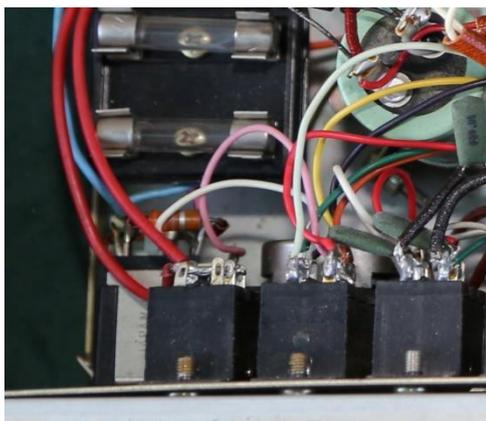


Back to the Diamond, if you look how it was put together, it looks like the designers expected it to fail regularly (or was that a hangover from endless work to make it work acceptably) as the main board is mounted upside down, over a large hole, making changing parts a breeze.

Now look at all that wiring, what a mess, and where is the shielding etc.

One surprise is the input selector, two selections for a turntable; normally such a selector would be on the back panel, as one doesn't generally change your turntable cartridge that often.

I was expecting a great rise in the noise when I selected the magnetic pre-amp, but it wasn't so, there was almost no change at all. I didn't actually connect a turntable, so who knows if it actually works. Or maybe it has really low gain, hence the lack of noise – what was there was all but drowned out by heaps of noise in the main amplifier.

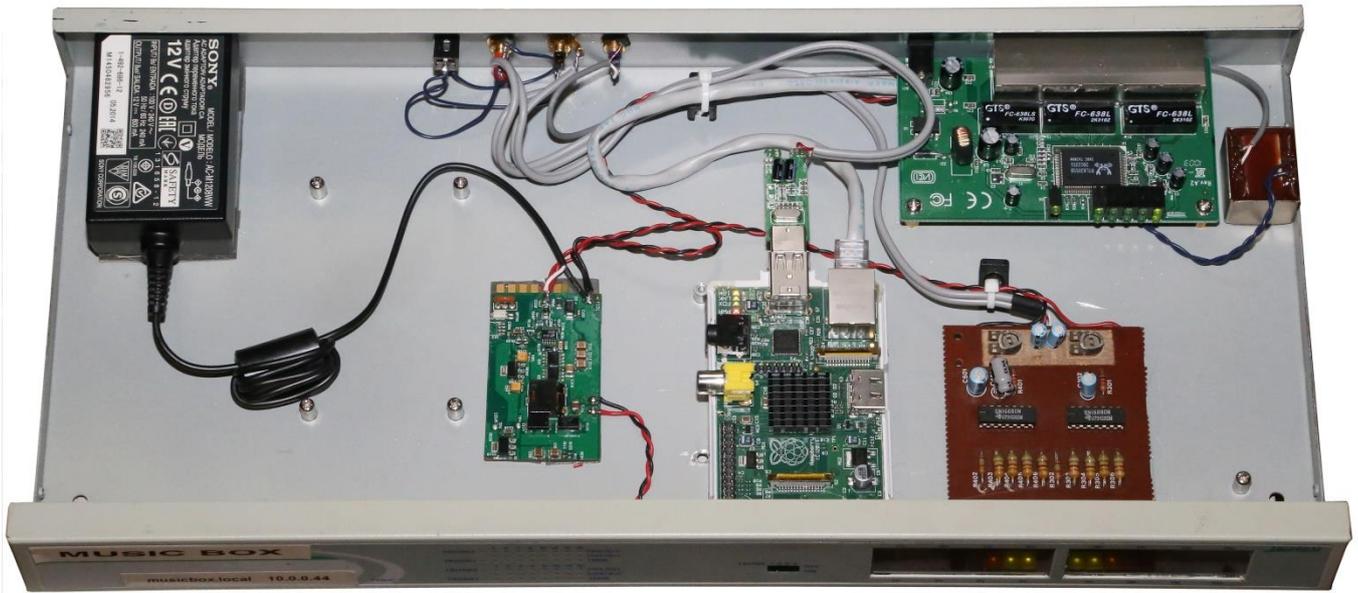


I was also no fan of the all but dodgy mains wiring around the power switch, with basically no isolation between it and the surrounding audio wiring, live solder tags etc. And then there was the soldering Real 'A grade' (not) stuff.

So did I repair it – No. After fitting the power lead, I figured I'd already spent more time on it than it was worth.

Paul VK3TGX

Pi MusicBox



To drive my whole-house sound system, I have mentioned before, I wanted some form of “Juke Box” that was easy to drive without having to walk over to the HiFi to control. Whilst browsing the good old world wide web, I came across a project to turn a Raspberry Pi computer into a music box. I downloaded a copy and apart from mucking up the config file once or twice, I really

liked the sound it was putting out. I was initially using an Edirol UA-1EX (Roland) USB audio interface, however I didn't really want to build that into the final device, as it gets a fair amount of use digitising vinyl records etc., so I ended up using an adapter that was part of a set of USB headphones. The Edirol should be better, however in my environment the headphone D/A interface is cutting it. I would like to eventually upgrade to an ‘Asynchronous’ audio adapter. PC

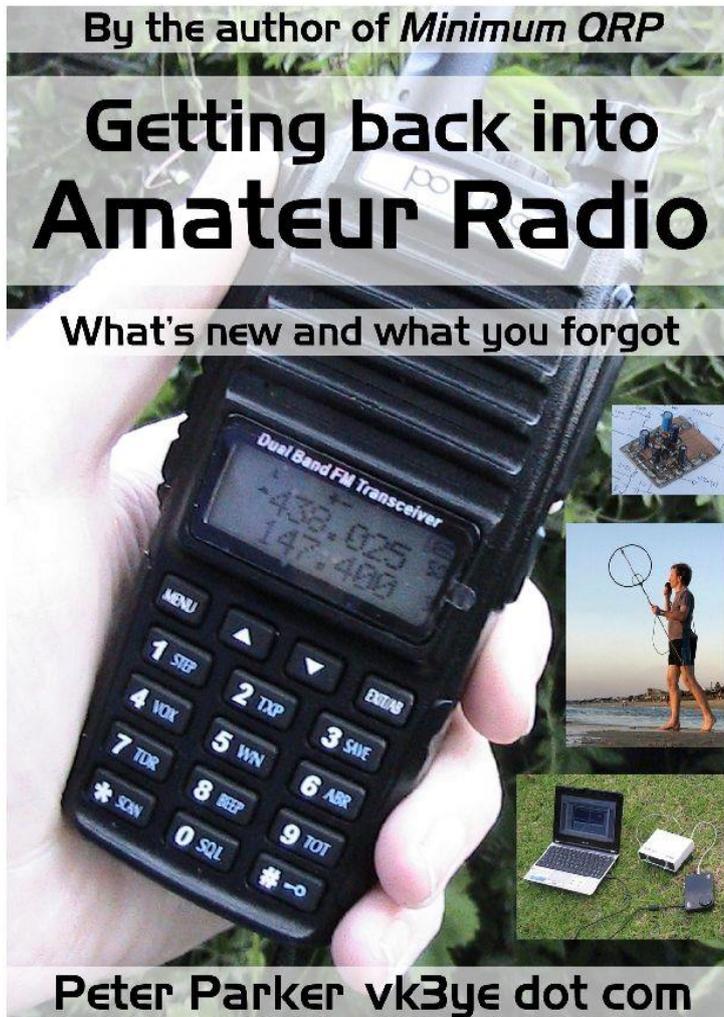


Computers generate the audio clock/timing mostly in software, so there is quite a bit of jitter. With asynchronous audio, the D/A provides the master clock in hardware, so the theory goes that the audio should be a lot cleaner. When the original IBM PC was designed, the only audio was from a timer chip, only intended to produce beeps etc. The very first add on audio boards were simple resistor ladders connected to the 8 data bits from the parallel printer port. Audio interfaces for the PC have come a long way, but with audio never being in the basic design, no dedicated hardware audio clock is present, so the purists believe you have to add one to truly succeed. Even with a USB interface, the interface is not traditionally in control, the PC and Windows is the master clock. To me the Raspberry Pi sounds better, not sure why, maybe being dedicated to sound (in this case) with no graphics interface in the way helps. Yes the R-pi has an audio jack, and ‘Pi MusicBox’ <http://www.pimusicbox.com/> does support it, but it was never intended to be HiFi, and is not recommended. You don't need to put it all into a case as I did, but I did want a nice all in one stackable/rack mountable solution. Apart from the pi, there is a 240 to 12V 800mA supply (top left) , a 12 to 5V 8A converter, a 5 port Ethernet switch (top right), a stereo bar graph display (bottom right). The audio D/A is hanging directly out the back of the pi, right of dead centre. To control it all you use anything (phone, tablet, laptop etc.) with a web browser. My audio files could be loaded on-board, but I keep them on a Netgear NAS. Apple air play & DLNA streaming are also supported alongside internet radio etc.

Paul VK3TGX



Extracts from *Getting back into Amateur Radio*



Item 5: Online information about amateur radio

Geographically remote or can't get to a club meeting? Consider asking questions on an online forum or group. Those on qrz.com and eham.net are the biggest but there are also country-based and specialist forums. They carry some great answers and informative discussions worth saving or bookmarking. [Facebook](https://www.facebook.com/) groups are even more popular and exist for most aspects of amateur radio.

Social media has its dark side, though. Like the village market, participants comprise a cross-section of humanity, including know-it-alls, bigots, inarticulates, the short-fused, the backward and the socially challenged. Post count does not equal technical expertise. And technical expertise does not equal social maturity.

It's amazing how some who behave acceptably on the air or in person become abrasive trolls online. Nasty comments reflect more on the writer than their target. Ignore them and don't let them affect either you personally or your interest in radio.

At the same time, there are things that returnees (or newcomers) with questions can do to make the forum experience more pleasant for everyone, including those trying to help. These include:

- Use the forum's search function to find past discussions on a topic you wish to know more about. Your exact question may have already been answered.
- Search Google for the answer before asking. Again, there is a high chance others have had similar questions answered.
- Mention the prior steps you took to find an answer when you do ask a question. Replies will be better if respondents can see you've made an effort first.
- Specific questions get the best answers. A broad question like 'what is the best HF antenna' requires a book-length answer that no one will write. Whereas stating preferred bands and distances, available space and cost requirements should elicit useful answers.
- Respect readers' and respondents' time. This means writing clearly, spelling well and rereading before posting. Results will be better this way.

Without formal vetting of forum posts, answers received will vary in suitability and accuracy. A lot of nonsense is sprouted on antennas, for instance. Someone may claim something 'works' but their definition of this might be signals substantially weaker than those achieved with a common dipole. Other replies may be from perfectionists with professional or engineering backgrounds. Their responses may be technically correct but could prove discouraging if their recommendations exceed available space and budget. Consequently forums should supplement your reading rather than be your sole source of information.

Enjoyed the read? There's more in '*Getting back into Amateur Radio*' by Peter Parker VK3YE. It's available as an ebook through Amazon for \$6.99. Search the title on Amazon, like 'VK3YE Radio Books' on Facebook or visit vk3ye.com for more details.

General Meeting Minutes

Date : 21/7/2017

Start time : .

Chairperson : Ian VK3BUF

Minute Taker : as above

Visitors:

Guest Speaker tonight: None

Tonight there is no guest speaker. An early night is in order to prepare for the Hamfest Sale in the morning

Treasurer's report: Prepared by Chris VK3QB

- Transition from Quick Books is now complete

Read & moved: Ian VK3BUF **Seconded:** Leigh, VK3FACB **Approved:** yes

Previous Minutes: As previously distributed in June magazine

Moved Albert VK3BQO, **Seconded** Helmut VK3DHI **Approved:** yes

Business arising from the previous minutes:

- Comment on the successful 40th Anniversary luncheon
- Only 2 hats GGREC remaining for sale

VK3RWD Repeater move to Seaview

- Move completed. Details elsewhere in this months magazine

Hamfest Sale

- All tables booked ok
- Brian & Nils prepared showbags
- Helpers needed for the kitchen and BBQ from 7:30 am onwards

Club License information

- upgraded to reflect operations bt Standard & F call licensees

Meeting closed :

Next Prac Night : 04/8/2017 Intro into how to use an FT-950 (Need to Know series)



Club Information



Meetings 2000hrs on third Friday of the month at the
 Cranbourne Guide Grant Street Cranbourne
 Prac nights first Friday in the Peter Pavey Clubrooms Cranbourne 1930hrs
 Visitors are always welcome to attend

Office bearers

President	Ian Jackson	VK3BUF	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	Mark Clohesy	VK3PKT	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 VK3RDD – Currently de-commissioned until further notice - *sorry*
 70cm Repeater Cranbourne VK3RLP In 434.475MHz Out 439.475MHz CTCSS 91.5Hz
 VK3RLP Repeater supports Remote Internet access (IRLP), Node 6794.
 70cm Repeater Drouin 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

Membership Fee Schedule

- Pension Member rate \$25.00 Extra Family Member \$20.00
- Standard Member rate \$40.00 Junior Member rate \$25.00
- Fees can be paid by EFT to BSB 633000 - Account 146016746.
- Always identify your EFT payments.
- Membership Fee's 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, C/O Ian Jackson, 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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