



GATEWAY

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

February 2022



90 Years of ABC – VK90ABC

Vacuum Florescent Displays

Digital Audio Amps Noise

And More



Cover photo, Australia Day – too hot outside for most.

(If you have any good photos, please send them in)

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Note: - club meeting minutes are now via a link in club emails sent out by the secretary.

Event Queue

February:

- 4th Prac/Natter night
- 18th General meeting

March:

- 4th Prac/Natter night
- 18th General meeting
- 19-20th John Moyle Memorial Field Day - Courtesy WIA

<p style="text-align: center;">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</p>
--

GGREC President's Message

President's Message

Attendance at the general meetings and prac nights have not returned to pre Covid numbers but are slowly increasing. We have been holding our meetings in the Guide hall to ensure that we can have Covid safe meetings with plenty of room to provide social distancing. It would be great to see more members coming along to the meetings and joining in.

We are looking at ways to raise funds for the Club to cover our operating costs and to keep membership fee as low as possible. The Committee is currently organising a Bunnings BBQ sausage day at Cranbourne and we will be looking for member support to make this a success.

The Cranbourne Community Hall is no longer a suitable location for our Hamfest so the search is on for an alternative location. Please contact the Committee if you know of a potential site.

The 10:00am morning coffee group on VK3RGW is attracting amateurs from around Melbourne and we have had many good conversations and have attracted new members to our Club. Having a regular time each day to talk to fellow amateurs has been appreciated by those that attend on a daily basis.

Looking ahead, we have our Annual General Meeting in April and I encourage members to consider nominating for a committee position to help run the Club for the next 12 months.

Kind regards,
Bruno Tonizzo VK3BFT
President GGREC Inc.

Guest Speaker

At the February General Meeting, Peter Cossins VK3BFG will be giving us a talk on Digital Amateur Television (DATV). The DATV repeater VK3RTV is now purely digital with three inputs of 1246 MHz, 1255 MHz and 1278 MHz DVB-S. The output is a multiplexed signal on 445.5 MHz DVB-T with QPSK modulation. The transmitter has an output of output of 100 watts. VK3RTV is located at Mount View, right next to the Victorian Police Academy in the eastern suburbs of Melbourne.

This will be a good opportunity to learn how to view DATV Broadcasts and become a DATV operator.

Bruno Tonizzo

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From The Editor



Suitcase Audio, (Or a 'Boom Case')

Having seen a few vendors offering suitcase speakers, I got a tad interested, however not in their inflated prices.

In my junk pile was an old Toshiba VHS camcorder (full size, none of this 'c' junk) case, I also had the leftovers of a home theatre centre speaker, well just the front panel & drivers.

This case is what is known as 'Blow moulded' as in it has all these shapes inside to suit the camcorder and it's accessories,

now a right pain. In the end I used a router to cut the driver holes and make some space.

Take it slow and easy, less the router grabs a hold and flicks out into a part of your anatomy.

I had been using a Dremel rotary tool; however I was getting sick of cutting disks that lasted for all of three minutes before they shattered from the unavoidable side forces involved.

Now for the electronics, I started looking on Banggood for a Bluetooth receiver & stereo amp combination. Up until now I was never a fan of Bluetooth, as it only worked with compressed audio. If your audio files were already compressed, and compatible with the formats supported by Bluetooth, then it could be argued that there was nothing to lose. However there is no guarantee that your audio player (phone etc.) will send it through in its original compressed state, as opposed to decompressing it, adding a touch of its own processing then re-compressing it to send to the speaker – Double Yuk.

The very latest version of Bluetooth does support uncompressed audio, but not at high bit rates, so things are getting better, However I found it near impossible to tell whether the various decoder boards on offer support this – the technical details were poor to say the least, it seemed the person putting up the ads had just come over from the shoe department.



Then I had a touch of inspiration, why not just test it as a speaker before getting carried away ordering a pile of parts!

So I connected it to an amplifier, and - well the description of the unit to the left was right – a 'Boom Case', as in boom boom boom, not bass, just crappy mid frequency boom.

So save your \$250 US, these are a joke.

Time for a 'smoking ceremony' with the aid of some lighter fluid....

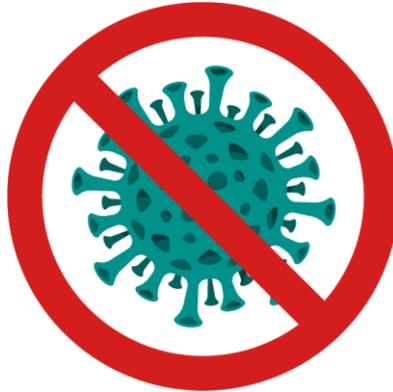


Paul VK3TGX

GGREC Club Activity and News

Covid Safe Meetings.

To help stop the spread of Covid we encourage members to wear a mask indoors, bring your own coffee cup, check-in to the Club shack and Guide Hall by using the QR codes. Hand sanitiser will be available for you to use at the meetings.



What does "73" mean?

The use (or maybe misuse) of the term 73 came up for discussion at the Australia Day BBQ recently. Perhaps this will clarify its origin and correct use for future contacts.

Quite often, even on local repeaters, you will hear operators close out a conversation with somebody else by including the term "73" or "73s."

The traditional expression "73" goes right back to the beginning of the landline telegraph days. In the original National Telegraph Convention, the numeral represented a greeting, a friendly "word" between operators and it was so used on all wires.

In 1859, the Western Union Company set up the standard "92 Code" (see link below). A list of numerals from one to 922 was compiled to indicate a series of prepared phrases for use by the operators on the wires. Here, in the 92 Code, 73 changes from a fraternal sign to a very flowery "accept my compliments," which was in keeping with the florid language of that era.

Over the years from 1859 to 1900, the many manuals of telegraphy show variations of this meaning. Dodge's The Telegraph Instructor shows it merely as "compliments." The Twentieth Century Manual of Railway and Commercial Telegraphy defines it two ways; one listing as "my compliments to you;" but in the glossary of abbreviations it is merely "compliments." By 1908, however, a later edition of the Dodge Manual gives us today's definition of "best regards" with a backward look at the older meanings in another part of the work where it also lists it as "compliments."

"Best regards" is the generally accepted meaning of 73 today.

Information published in unknown source.

Note that the correct term is "73", not "73s" but that is what we amateurs do to things.

I doubt that "best 73" has any extra meaning either.

Definitely stay away from using "88" or "88s."

For more information, visit

<http://www.civilwarsignals.org/pages/tele/wurules1866/92code.html>



Club members Chris VK3QB and Ian VK3BUF have pulled together Special Event station VK90ABC with the support of the Radio Amateur Society of Australia.

The Australian Broadcasting Corporation (ABC) and amateur radio have a lot in common; both utilise the magic of radio. For the last 90 years this magic has informed, entertained, saved lives and brought people together. Our world is a smaller place thanks to the magic of radio.

During 2022, amateur radio operators across Australia will be using the **special event callsign VK90ABC** to make contact with other amateur radio operators across Australia and around the world.

We will be talking about the national broadcaster, its history and helping 'aunty' celebrate this magnificent milestone.

This special event has two main objectives:

- Celebrate the 90th anniversary of the national broadcaster, the ABC; and
- Promote the hobby of Amateur Radio on ABC radio and share details of our celebrations with them.

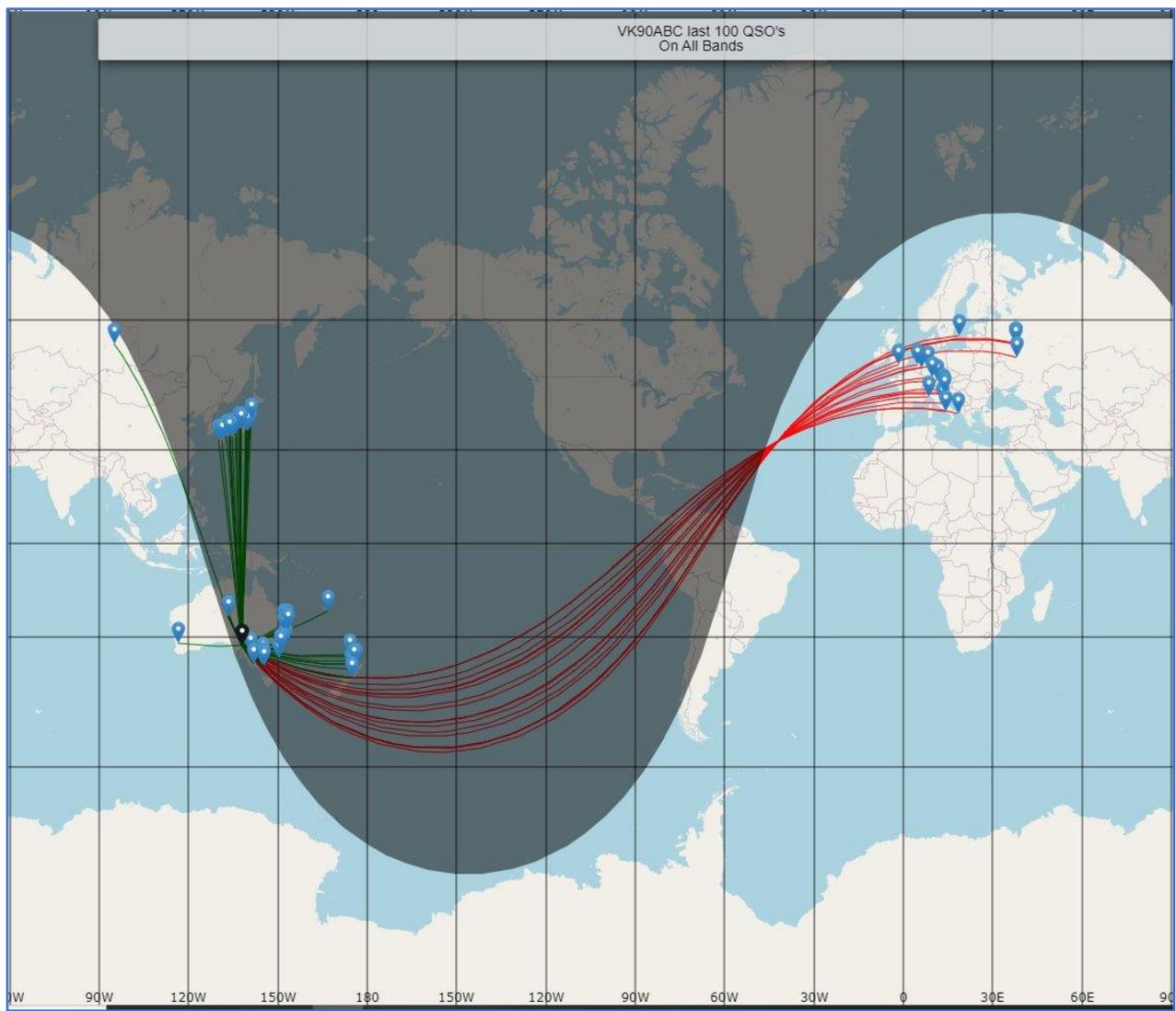
All Australian amateurs can apply to use the callsign. Special event callsigns generally attract the interest of amateurs both here in VK as well as from around the world.

A couple of ops have given us some feedback already.

The first day of activity by Frank VK5KV yielded great results:

The very first day of activation of "VK90ABC", I started on 10m later moving to 20m when the long path opened. So much interest explaining the reason for the "Special Event" Callsign, I just could not pull every station out of the pile up from VK/ZL and later on the World! Within 6 hours I had logged 233 contacts and 13 Countries not bad for the first day. The attached file is just a few contacts on 10m overall I think nearly 180 contacts on 10m in a few hours from Port Augusta in SA's North 30/1/22, VK5KV...

This shows only my last 100 contacts out of 233 for the day while activating VK90ABC on the 30/1/22 was a blast from Port Augusta Nth SA.. VK5KV



Well known DXer and WWFF enthusiast, Paul VK5PAS reported....

Yesterday I made a total of 448 QSOs and 43 different DXCC entities worked. All on SSB on 10, 15, 20, 40, & 80m.

The map below shows my contacts.



Paul was also interviewed by Matt Stephens at ABC Riverland. Paul is a great ambassador for the hobby; you can listen to the interview here.

<https://vk90abc.net/abc-radio-interview/>

Dan VK6II was scheduled to use VK90ABC last weekend... but as many readers will be aware there have been some rather ferocious and life-threatening fires in SW VK6. Consequently, Dan's efforts were thwarted and he only made a small number of FT8 contacts. Dan sent us this photo from his property.



I've spoken with Dan since, and he is safe with no damage to property or life... very good news indeed. Dan will have another go with VK90ABC when the dust settles.

Over the course of the year, we'll also be looking at stories about ABC's history, be they about local regional stations, or more broadly surrounding the history of Aunty.

GGREC has a very capable HF station. Any members who don't have access to HF at home should give it a go at the club room (subject to the club's Covid policy).

We have a website with details about the special event, some insight into the ABC's history (which we'll add to through the year), as well as an online booking engine.

- [Home](#)
- [About amateur radio](#)
- [Book VK90ABC](#)
- [Contact us](#)
- [Australia's first licenced public radio broadcast](#)
- [News updates](#)
- [ABC history \(ABC website\)](#)
- [90 years of the ABC \(ABC website\)](#)
- [Using VK90ABC – Policy for use](#)
- [ABC Radio Interview](#)

If you have questions, send us an email.

[Send Email](#)

February 2022

SU	MO	TU	WE	TH	FR	SA
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

Powered by [Booking Calendar](#)

- Available - Booked - Pending

First Name*:

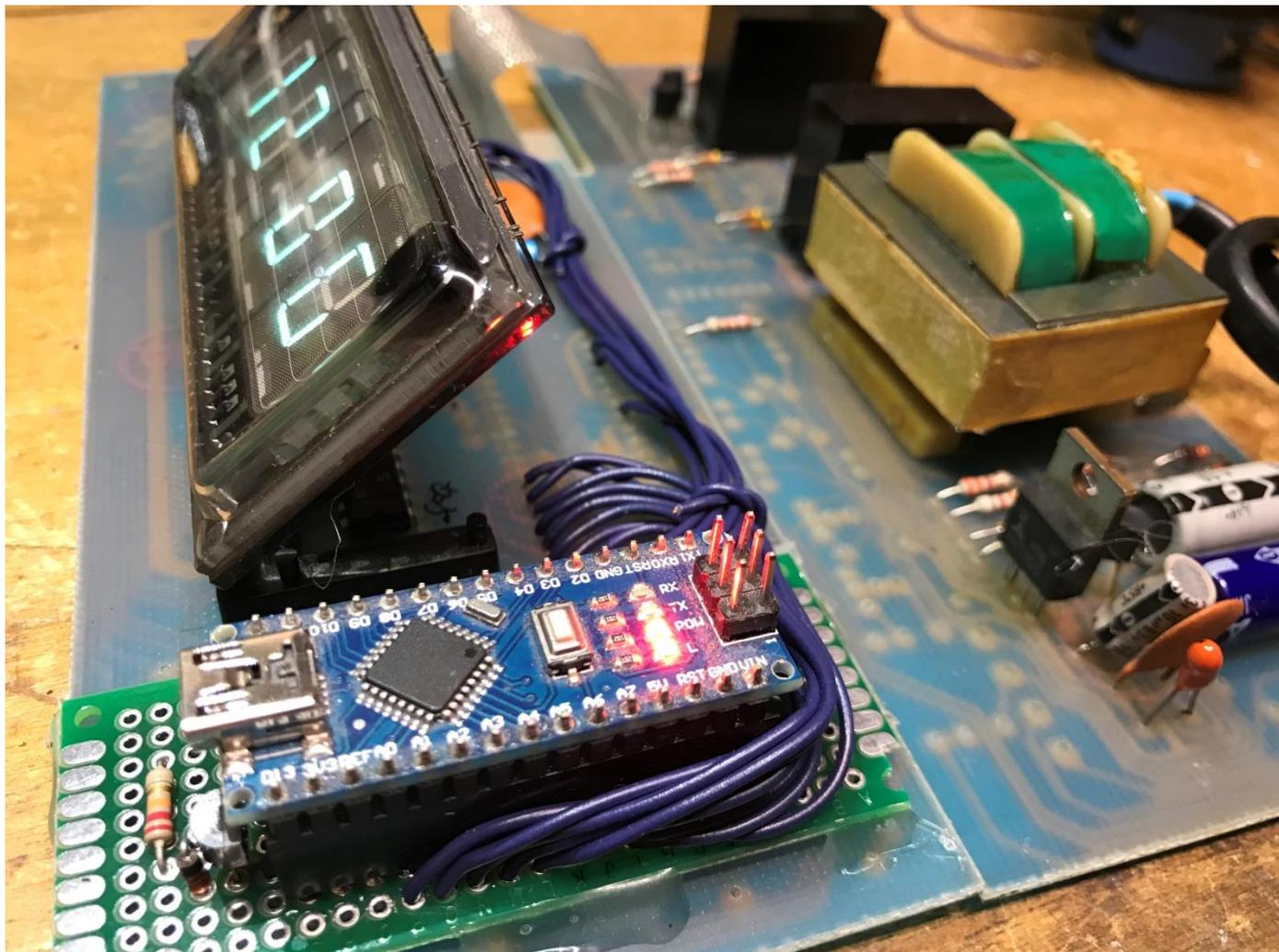
www.vk90abc.net

If you have any questions, or would like to know more about this special event, please drop us an email info@vk90abc.net

73, Chris VK3QB

VK90ABC Admin

Vacuum Florescent Displays

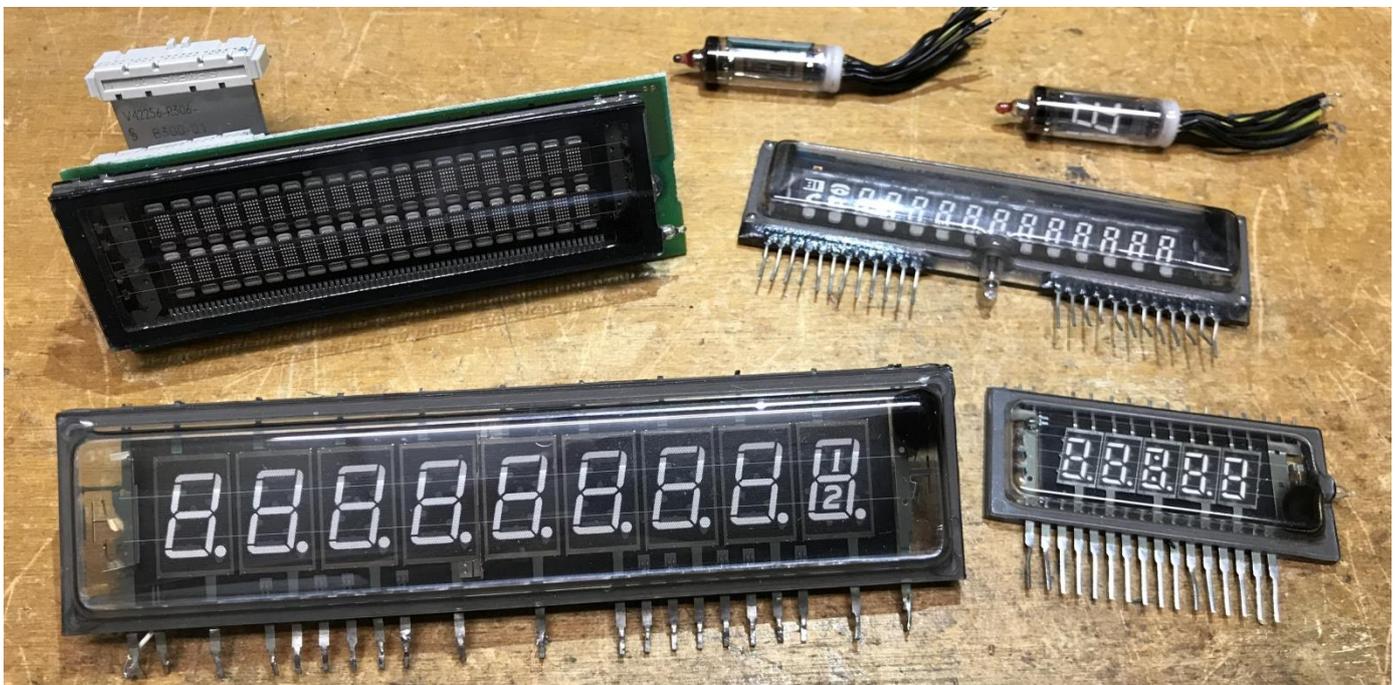


As you may have noticed, I have collected a fair selection of displays, one type that I had yet to make use of was a VFD, or 'Vacuum Florescent Display', they seem to be finally disappearing, however they once ruled in a lot of equipment, from microwave ovens to video cassette players, HiFi, & even in early calculators.

These displays are basically a valve, or vacuum tube, depending on where you come from. It seemed that they would never be supplanted in VCR's etc. These days microwave ovens generally use LED displays, and what's left of the HiFi industry has also let them go – I'm thinking that with modern HiFi no longer being a mass market item, the cost of the custom VFD's so often seen in them would be far too high. Make several million CD players, no probs, but with runs of the odd thousand or less, the cost of custom tooling cannot be justified.

VFD's are kind of configured like a directly heated triode valve. The filament usually runs on 3 to 5V AC, and the HT ranges from 12 to 30V, so a valve that's completely safe to play with, no surprise shocks and leaps across the room after your finger ends up where it shouldn't be.

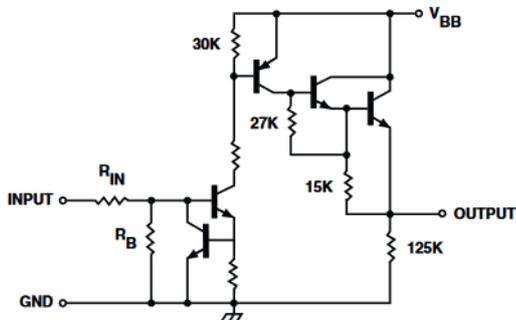
The strangest part, is at these low voltages, the grid drive is totally different to an normal triode on, say 300V. In a normal triode circuit the grid is always negative with respect to the cathode. If you bring the grid to zero volts, the tube is usually hard on, saturated. However at 20V on a VFD, zero volts (with respect to the cathode) means it is cut off, no drive. To turn on that grid you have to pull it all the way positive.



The driver IC usually used is identical for both the anodes & the grids, pulling them to +20V for an 'on' state. (or whatever the HT rail being used)

A typical 7 segment 4 digit display will have 7 anodes, one for each or the 7 segments in the 7 segment pattern, with all the same segments joined, as per a multi-digit LED display, then there is a grid for each digit, 4, in this example. Say you want to light the 'a' segment in digit 2 only, you would pull the 'a' anode line to +20V, and also the grid for digit 2 will need to see 20V, with all the rest at near Zero volts.

**PARTIAL SCHEMATIC
ONE DRIVER (ALL TYPES)**

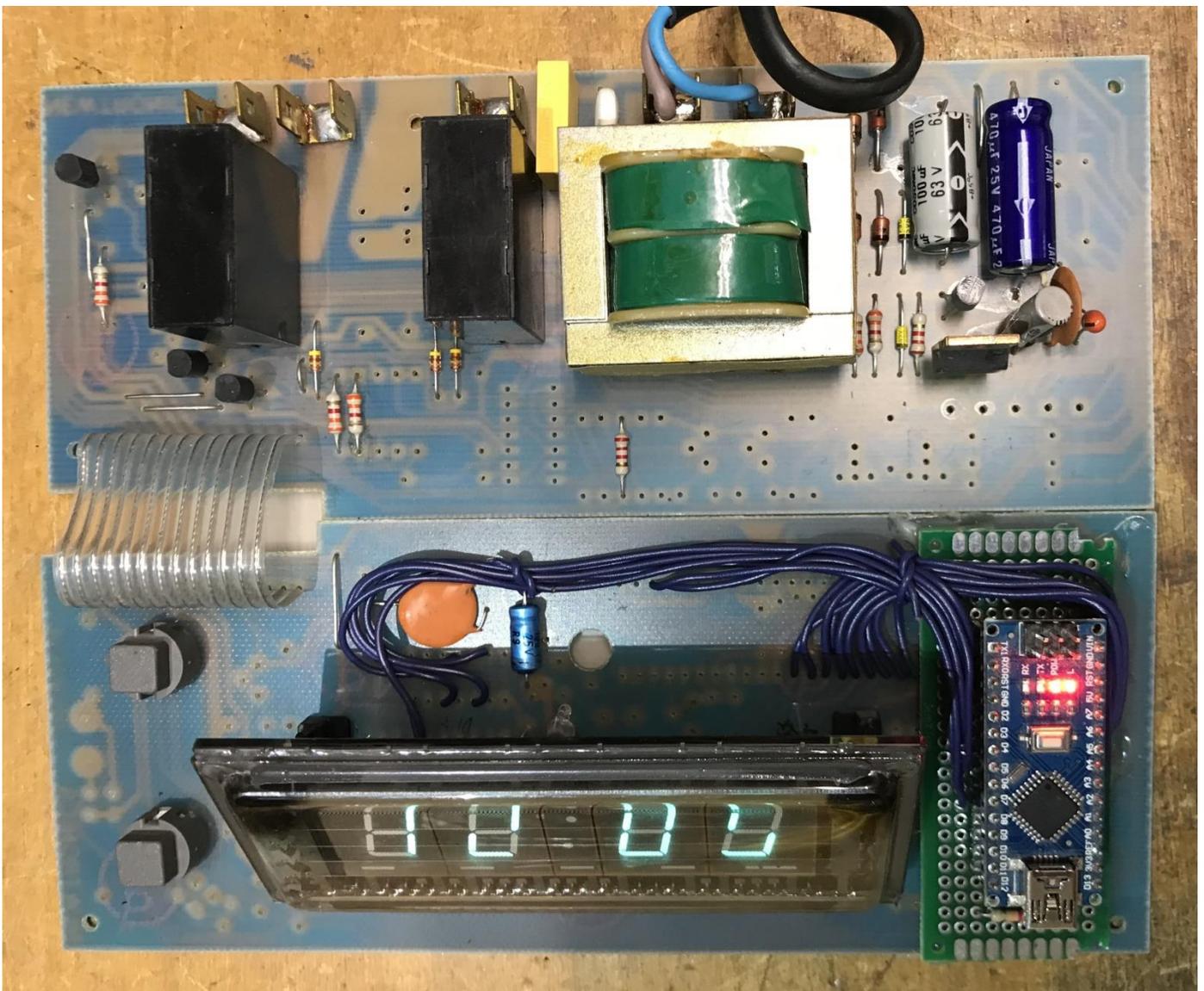


R_{IN}	R_B
10 k Ω	30 k Ω

Jaycar currently sell the UDN6118A (Jaycar # ZD1882, \$9.95), and a small 11 digit display (ZD1880, \$2.95) . While the display tube is cheap, the drivers are not, especially as you will need 3 to run this display. However, as the specs for this display tube is for 12V only on the HT supply, then you can drive it using good old CMOS IC's as 12V is in their range, a far cheaper solution. Jaycar also have the 4511 BCD to 7 segment decoder IC's, that, according to their data sheet, can (at 12V) also drive a VFD.

As you can see here, the gizzards of the 6118 are not that complicated and something could be done with discreet transistors. With this IC, it is assumed that the micro (or whatever) is sharing it's earth with the cathode of the display, if instead you connect the 5V micro controller line to the 'VBB', or HT line positive, and let the cathode/heater sit down at negative 15V or so, then a lot of the complexity of this IC can be deleted.

For my first foray into these displays, I cheated somewhat, I had a timer module (clock) rescued from my parents oven. It kept resetting itself, losing the time and displaying 'Help', they didn't really need the clock, so we just pulled it out and put in a bit of black card where it was – they never missed it. Many years later I looked into it and saw the fault immediately, a tantalum cap in the micro's reset line. When it first came out of the oven I was a lot younger and had no idea why it kept dying. Hindsight is amazing.



I started by removing 90% of the parts from the display (lower) board, leaving just the display tube, two driver IC's and the odd bypass capacitor. I then hotmelt glued an Arduino nano on a proto board in place and wired it to where the original 8049 micro lived.



Once reassembled back into its plastic case the Nano now sticks out, kind of as a feature piece where two rotary switches originally lived



Years ago I picked up this instrument box at a hamfest, it kind of looked right for that clock, which has been sitting in there, as it was, for years, unmodified, waiting for me to get infused.

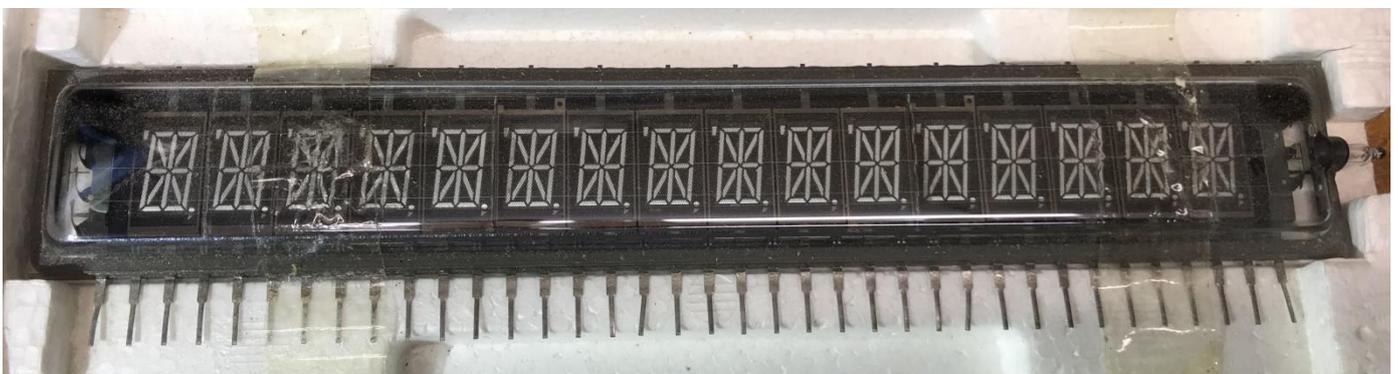
It's sitting a little bit back, some metal needs to be cut away, then a smoky plastic front should make it look like a bought one.

The rear board has two relays on it, with room for a third. Adding some 240V power sockets to the rear panel should be easy, although I was surprised how the relays were configured. They are normally closed – as in default to on, not off as is usually the case, not sure why.

The timer module case is labelled 'Seeley', A company I usually associate with mattresses, not ovens etc., however they are now quite large and have many brands under their belt. They started in 1972 in South Aus, and have grown a tad since then.

The circuit boards are labelled 'Newtronics', and a quick Google would have you think they still exist, wrong. They were into instrumentation and controls, based in Tullamarine; they are still listed in places as an exporter. However they were taken over by ATCO controls, but something went wrong (stupidly complex monetary carryon) and now are listed under a liquidator with Seeley as a creditor (as I said, complicated) with the high court getting involved in 2014.

Darn, another Australian company bites the dust.



Many years ago, Dick Smith Electronics was selling a VFD based moving message display unit, trouble was the only way to enter a message was via a silly keypad – plus the price was not right, so in a moment of inspiration, I contacted their spare parts department and ordered a spare display tube. Way cheaper and with none of the crappy baggage attached, maybe it's time I pulled it from its foam carrier and put it into service.

This tube has 18 anodes and 16 grids, so I need 34 drivers – as in 5 UDN6118, all but \$50, yikes, however I do have a bag of PNP transistors, so I guess I'll be going down the 'spin your own driver' track with this one. (just looked on eBay, \$23.51 ea, Yyyiiikkkeess in the extreme)

A while ago I bought a pile of 8 bit serial in, parallel out, shift registers, 5 should do the job as I don't have anything with 34 outputs to directly drive the 34 transistors.



Ever used one of those two line LCD character displays?

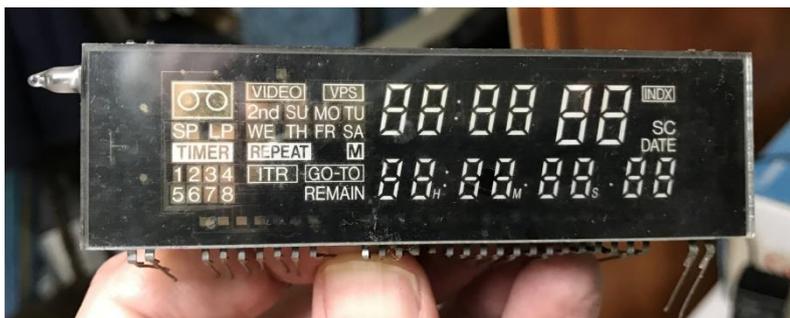
One of these Futaba VFD's will plug straight in, same interface, no other changes needed

Pity they are a tad small

Nice and bright though.



And something from my mystery box, maybe I'll be able to get it going one day...



Normally the segments are at the back with the grid & filaments on top, well this one flips that all in its head, with the segments & phosphor on the front glass



Or how about a VFD VU meter.



Paul VK3TGX

Digital Audio Amps (More HF Noise)



Recently I was handed a Philips home theatre system – well most parts, and asked whether I could get it going, the owner being a rather active ‘road kill’ collector kind of explained some water damage & why there was no remote control etc., and the DVD player also looking like it had had a hard life.

The system consists of a subwoofer that houses all the amplifiers, a DVD player, and 5 satellite speakers. All audio ins and outs are on the DVD player, the subwoofer cabinet only has speaker outs, no audio in, so if you lose the DVD player, its game over. The DVD player connects to the sub via a 15pin cable, that looks like, and is called in the manual, a VGA cable. Trouble is the pinouts don’t match VGA cabling. (Amazingly, I was able to download the service manual) I tried two VGA cables, with differing results. One gave no subwoofer drive, the other nixed a few satellite speakers’ channels, otherwise it basically worked.

On the Philips website, where I found the manuals etc., you could seek a service centre, even when I selected the whole of Australia it still said there were none in your area, widen your search – Now come on Mr Philips, this is kind of ridiculous. (Do they actually want any customers?)

So what now – I lided it of course, well the subwoofer, I highly doubted I’d find much of interest in the DVD player – they are all (apart from the ones with on-board amps) basically the same.



The back of the subwoofer contains a version of what is commonly called a ‘plate amplifier’, as the whole system is built on a metal plate that screws into a hole in the speakers back. You could easily replace it with a near blank plate and you’d have a more or less regular speaker.

Actually the hole where the amp is is a dedicated chamber, giving no access to the drivers, the system is quite happy to have a gaping big hole in the back of the sub. In a way they had no choice here as it has a cooling fan and air return vent, items not quite compatible with a sealed speaker enclosure.

Most plate amps are totally sealed, with heatsinks on the outside of the back, meaning they seal the hole, allowing them to share the same space as the speaker drivers.

- That is why I called it a ‘version’ as it is not sealed



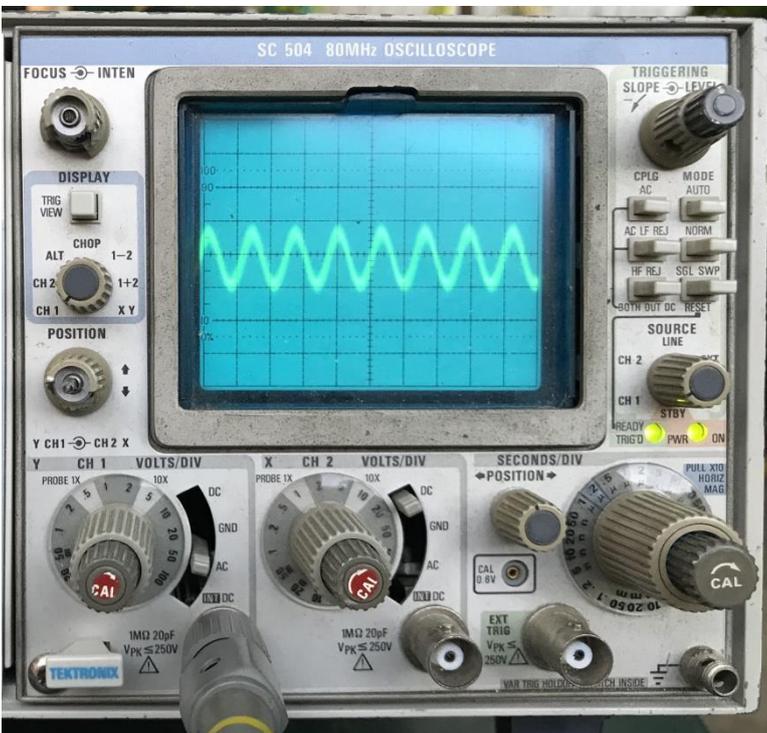
The first thing I noticed was that this was a digital, as in a class 'D' amp, run from a 27V switchmode power supply.

According to the specs it puts out 250W into both the subwoofer speaker, and the centre channel speaker, with 125W to the rest.

My calculations came to a far less power output, so those manufacturer specs are 'music power', not RMS. There are some standards to 'music power', that not many follow, or have even heard of, so it's kind of 'say what you like' power.

I pulled apart the centre speaker, it contained two 40W drivers & a tweeter, not bad for something expecting 250W. I pushed it hard, it was not that loud and could do that all day with no stress, so 250W – Ha.

The other issue was the speaker wire, it's got to be some of the thinnest wire I've seen used for this task. Especially given the impedance of the centre speaker, 2 ohms!



Now for the bad bit, class 'D' uses switch-mode power supply technology; the actual output stage produces rail to rail square waves, often at about 250KHz. This then goes through some filters before leaving for the speakers.

These filters have to let audio through, at several amps, so the filter design cannot be too aggressive. As my scope shot shows, yes the square bit is gone, but there is still a hell of a lot of the fundamental still there. The waveform you are seeing is NOT audio, but the switching, or PWM waveform, that emanates from the amplifier on unshielded wire. (shot with no audio)

I put a broadcast AM radio next to the amp, and many birdies were evident. Unfortunately this type of amplifier had become the norm in most modern equipment. The IC's are cheap and small, quite often needing no heatsink. This is the output from a reputable manufacturer, what do you get from the lesser companies?





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The GGREC is an affiliated club of the WIA

WIA Affiliated Club

We also give Thanks to



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	Bruno Tonizzo	VK3BFT	Web Master	Mark Clohesy	VK3PKT
Admin Sec	Miguel Vaca	VK3CPU	Magazine Editor	Paul Stubbs	VK3TGX
Treasurer	Klaus Illhardt	VK3IU	Property Officer	'committee'	
General 1	Bruce Williams	VK3BRW	Assoc. Secretary	Miguel Vaca	VK3CPU
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 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)

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