



# GATEWAY

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

**October 2020**



**Part 2, Software Defined Radio**

**The dbx 117 (& 119)**

**Purchasing Fraud**

**And More**

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Note: - club meeting minutes are on the club website

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## Event Queue

### October:

- 16<sup>th</sup> General meeting – 8:00, [via video link, see club emails](#)
- 24-25<sup>th</sup> CQ WW DX SSB – courtesy WIA

### November:

- 6<sup>th</sup> Prac/Natter night, [via video link, see club emails](#)
- 20<sup>th</sup> General meeting – 8:00, [via video link, see club emails](#)
- 28-29<sup>th</sup> CQ WW DX CW – courtesy WIA

### March:

- 10<sup>th</sup> Train & Hobby show 2021

<p><b>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</b></p>
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## President's Paragraph, Postulation or Preamble

Hello members and welcome to October and all that it brings. So far fruit mince pies and everything Christmas. Just in case we needed reminding that this year is almost gone. Of course, we have Halloween at the end of the month too, maybe we can put up a sign "In Isolation COVID-19 KEEP OUT" that should keep away the trick and treaters. Ba – Humbug.



The 10am morning coffee chat is still going strong on 70cm and so is the virtual Natter/Prac night. Earlier this month we did our "homework" and watched a video or two of Peter Parker VK3YE working through some satellites. A good discussion was had before we moved on to other topics. That and a glass or two of tippie made for an interesting evening. Please try and join us on the first Friday of November. We will send out an email with the G Meet link as the date gets closer.

The committee had their meeting last week. Members who have requested badges they will be ordered soon. I am just waiting for a confirmation before I do so. The committee agreed that we should begin preparing for the Train and Hobby show which will be held on the Labour Day weekend in March 2021. This will of course all be subject to the Government health requirements and will probably be held outside. We shall see, this will be raised in the general meeting for discussion and club approvals.

With Bruce within 5km of the club shack he has been periodically going over there and checking that all is still secure. Thank you, Bruce.

Albert has been updating the website to bring it in line with the current committee, club frequencies and Meeting cancellations due to Covid. Thank you, Albert.

Paul our Gateway editor again produced another bumper edition last month. Thank you, Paul. If you have any articles for the magazine/newsletter, please send them to the [committee@ggrec.org.au](mailto:committee@ggrec.org.au)

If there is anything that you would like to try or have a suggestion please contact the committee.

That is all for now. 73s

Michael

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## From The Editor



This month I have become a bit 'stuck' playing with my vintage computer gear. I wanted to do the next instalment where I talk about terminals and how one talked to these early machines. In a way we have come full circle here. In the beginning one used a totally separate device, a terminal, which in the early days was basically a modified typewriter to send and receive commands. It's almost comical to watch the earliest of these in action, as they just put a pile of solenoids under a typewriter, and you can see the key tops bounce as the computer sends text to it. By full circle, I am referring to the fact that in a lot of cases a modern PC can easily spend most of its time just being a 'terminal' to a remote system – as in a web browser talking to Facebook etc. It is not that uncommon to come across a computer with all but zero software installed, the user just using Windows and the supplied browser, and nothing else. I say almost, because some (users) get adventurous and install an alternative browser, like Firefox, or Google Chrome etc.

A few years ago I picked up this, an IBM 8363, later known as an n2200 NetVista thin station. It is basically a miniature computer that acts as a terminal on a network. These, and similar devices (not to be confused with an Intel 'NUC' etc.) can sometimes be spotted on desks at chemists, and tax agents etc. quite often attached to the back of a screen.

This I thought would be ideal, matched with an IBM monitor (pity about the keyboard) however that's as far as it has gone so far, try as I might I have not yet been able to get it going.

As far as I know, there is nothing wrong with it, it's just stuck in need of software. These were quite often booted up from a server machine, with the option of a local CF memory card. I have a card, but the files allude me. IBM unfortunately likes to clear the decks and when something becomes 'out of support' they soon delete all the supporting files off their servers.

I managed to get a copy of it from the 'Wayback machine', however I think I need the matching bios update file, which after many hours Googling, still alludes me.

Yes I can (and often do) just use any old computer as a terminal, however I was seeking something that looks the part. I'm trying to get a bit of 'look and feel' to my setup, after all with this old gear that is quite a part of it. If you just wanted something easy, computing wise, you wouldn't go near this old equipment.

I do have a very old black & white monitor that I am thinking would make a retro lookalike setup, even if the actual terminal bits will not be as old, however a suitable keyboard alludes me. 99.9% of what's out there is from PC clones. So the quest continues. Maybe I'll just grab a pile of keyswitches and make my own. One thing I'm not keen to relive is just how crappy some of those old keyboards were, I worked in the 'Technical Support Group' at Telstra for many years fixing this stuff, so I know how bad it could get, pity I kept no samples.....

*Paul VK3TGX*

## *Part 2 Software Defined Radio (SDR)*

### *Older Style PC based Software Defined Radios and cheap SDR TV Dongles.*

#### **Introduction**

In our last article we looked at how SDRs came about, including the role the military, spy and other government agencies played in the development of SDRs. In this article we will discuss Personal Computer based SDRs (both internal and external) that are, or were available commercially or can be made up using cheap TV dongles, providing we use the right software.

#### **The Definition of a Software Defined Radio**

Software Defined Radio (SDR) is a radiocommunications system (Receiver or transceiver) where analogue signals have been traditionally implemented in hardware (e.g. RF amplifier, Mixer oscillator, Intermediate Frequency stages, filters, modulators /demodulators, detectors audio amplifiers etc.). The signal is instead digitised and then analysed by means of software on a personal PC or embedded system.

It should be noted that a handful of components are still needed to produce two digitised signals known as I and Q signals, which are then analysed using complex mathematical formula by the PC.

#### **Do SDR received signals have any issues when compared to Analogue Signals?**

##### *Sensitivity Problems*

All SDRs have receiver front ends that are wideband and very sensitive to allow them to pick up a wide range of signals at once, including distant weak signals. If an SDR appears to lack sensitivity, it is probably due to the attached antenna picking up unwanted noise from the PC's monitor, and to a lesser degree the PC itself, or some other nearby external interference source. If the noise is strong enough it can overload the front end of the receiver, causing its Automatic Gain Control (AGC) to kick in to reduce its sensitivity and stop its front end from being overloaded.

One way to avoid this from happening is to use some form of external antenna. A wideband Discone (looks like a disk mounted on top of a cone) antenna is a good choice. After mounting it outside, and as high as possible, use a good quality 50 ohm coaxial cable feed line, to bring the wanted signal into the receiver.

Also some monitors are better than others and the monitor lead should always be fitted with a ferrite suppressor. To find out if your monitor is a source of interference, turn it off with the SDR operational. If the noise disappears, or the sensitivity increases you know it's the source of the problem.

If the SDR is card based and mounted within the PC itself, make sure you keep it away from the video card and the power supply.

A mains RF filter may also help in some cases.

##### *Intermodulation Problems*

In areas with strong broadcast stations the receiver's front end may again be overloaded. (Turning the SDRs RF gain to high will produce a similar result. Either way unwanted intermodulation products may appear in the received band (clearly seen in the SDRs Spectrum Analyser and waterfall display). For this reason most SDRs are fitted with a local button. By pressing it the interference products will disappear. More sophisticated SDRs will also incorporate Variable notch and other types of filters, to take out any unwanted signals.

Loop antennas can also be used on some bands to null out unwanted signals and for long distance shortwave reception, the use of a tuned antenna and band preselectors certainly comes in handy.

#### **What Frequencies can we tune into on an SDR**

This is really dependant on how much we are prepared to spend on an SDR. Cheaper TV tuner dongle based SDRs costing around \$25 or so are usually only good for the VHF/UHF bands. However, up converters are also available for around \$40 to allow us to listen to bands lower than VHF. E.g. the High Frequency (HF) and medium wave AM broadcast bands. As I cover specific SDRs I will cover their main attributes, including what frequencies they can tune into.

#### **Looking at Specific Types of SDRs**

We will start with WINRADIO SDRs, in particular a model which predates TV dongles and the like.

##### *WINRADIO SDRs*

Not many people are aware that the award winning and immensely popular PC based WinRadio brand started here in Melbourne, Australia (their headquarters are currently located in St Kilda road). And they and were the first commercially available wideband communications receivers that were exported worldwide. They combined advanced digital receiver technology with the computing power of a PC. They first appeared on the scene around 1998 and more advanced models are still being sold today for military, surveillance and commercial use.

*The WR-1000/1500 series receivers* the first to be sold to the general public, offered two versions. One was built on a full sized ISA plug in PC card, running on Windows 95, 97 and later Windows XP operating software. The second version was housed in a purpose built standalone aluminium diecast box.

The PC based models 1000i/1500i (i standing for internal), required no additional desktop space, or external leads, other than one 3.5mm stereo lead running from the back of the SDR card to the external input of the PC's sound card. And the connection of an external antenna to the cards 50 ohm BNC connector to pick up the wanted radio signals. This means the SDR cards don't take up any additional PC interface ports, as all the communication within the PC is done via the ISA internal bus that the card is plugged into. Multi-channel operation is also easy to achieve as up to eight WinRadio SDR cards can be plugged into and used in the one PC simultaneously. See fig 1 for



Fig1 1000i WinRadio PC Card

installed 1000i WinRadio card.

The external versions 1000e/1500e (e meaning external), on the other hand is powered by a supplied plug pack or the optional WR PPS battery pack with inbuilt charger and needs to be connected to the PC via an RS-232 serial interface (the forerunner to USB ports). Or alternately an optional plug and play PCMCIA interface. The main advantage of the latter is that it allows you to connect the SDR to any laptop PC, giving you complete portability for vehicle or field use.

The WR 1000 series supports **four different reception modes** allowing you to listen to AM, FMN, FMW and SSB. Whilst the WR1500 series supports **six different reception modes**, CW, LSB, USB, AM, FMN and FMW.

An optional Digital suite can also be downloaded from the Winradio web site giving you additional features such as the ability to display and receive WEFAX (Satellite Weather Fax), HF Fax, Packet Radio, the Aircraft Addressing and Reporting System (ACARS) just to name a few.

Once you have installed the supplied software and hardware, as per the user guide instructions and opened the Winradio package, a Radio receiver will appear on the PC monitor. Additionally, if the Spectrum Scope is also selected from the top menu on the PC screen, it will also be shown on the screen monitor as well. Both can be sized and moved around accordingly, to suite your individual needs.

Most individuals show the Spectrum Scope (screen) under the Radio. See fig 2.

You can use your mouse or keyboard shortcuts to access all aspects of both **Radios:-**

For example, you can select the **modulation mode**



Fig2 WinRadio With Spectrum Scope Shown Below

(AM, FM etc.), by pushing the appropriate mode button. For the **frequency** you want (either type it in at the keyboard, or turn the tuning dial using your mouse), Other things

you can do is **set the volume, attenuate a strong local signal, or save stations to memory** for future call up. The radio also has a **signal level meter**, showing signal strength in dB above the noise floor and a squelch control.

By Using the **Spectrum scope**, in essence a built in Spectrum Analyser, you can readily see where the stations are located, what frequency they are on, what type of signals they are and how much bandwidth they occupy. For example an AM radio signal will look trident shaped showing the Carrier in the middle with the upper and lower sidebands either side of it. The spectrum scope will also show any unwanted signals, for example, caused by interference within the chosen passband.

The **Squelch** controls both the **audio output and scanner threshold**. In practice if the signal level drops below the squelch threshold, the audio output will be muted and if the signal rises above the squelch threshold, the audio is restored.

The Squelch setting also controls scanning. When in **scanning mode** the receiver will only stop on signals that appear in the Spectrum scope above the squelch setting. This can be used to eliminate the radio stopping on unwanted weak signals.

Scanning can be done either manually, automatically or from memory settings. In addition it can be set to various modes of operation. For example Frequency Range scanning allows you to specify multiple scanning ranges in a list. Each range is defined by the start and stop frequency, step size, mode and squelch setting.

## TV Dongles for Use as an SDR

In 2009 Antti Palosaari a Linux software developer from Finland, discovered that most TV dongles using the Realtek RTL2831U and the later more advanced RTL2832U demodulator chips also had an undocumented Radio mode that put I and Q signals (required to analyse digitised RF signals) out to the USB port. So Palosaari, along with other software developers from Osmocom (the Open Source Mobile Communications Group) developed suitable software and drivers to run on both Linux and Windows based operating systems. So using their software (which has been refined and modified over the years), we can create our own wideband VHF/UHF SDR from a cheap TV dongle.

### The Limitations of TV Dongles

Most TV dongles have a limited frequency range, can only show 2MB of Bandwidth at a time, don't come with a Temperature Controlled Crystal Oscillator(TCXO) to prevent frequency drift and they don't support Bias T options, which is used to power remote Low Noise amplifiers (LNA). The latter is usually mounted up the antenna mast close to the receiving antenna, if required, to pick up very weak long distance signals.

### Alternatives

Or we can purchase latter alternatives, which look similar to a TV dongle whilst taking SDR into account in their design.

If you read on you will see that I have covered some of the options available to us, but by no means all of them.

### Hauppauge TV Dongle (TV-NOVA-TD model 1222)

This Hauppauge TV dongle (typical of top of the range TV dongles of the day), first appeared in 1988. It supports 2 x HD DVB-T digital TV channels and DVB-T stereo radio channels (not DAB or DMB radio) and comes with TV software, a full size TV remote control and 2 antenna leads for a diversity antenna (no internal antenna supplied). It can virtually



Fig3 Hauppauge (WinTV) Dongle

do anything a DVR can do (Record a program whilst watching another etc.). If run using compatible SDR software (more about that later) you can use it as a Digital TV when plugged into one USB port and as an SDR when plugged into a separate USB port supporting the SDR software. See fig 3 and Summary Table 1.

### Nooelec NESDR Mini 2

Nooelec, along with other companies began producing DVB-T dongles that also directly supported SDR.



Fig4 Nooelec NESDR mini (SDR & DVB-T)

This particular dongle has a wider frequency range than a TV dongle, but still no TCXO making the received frequency prone to drift and no Bias T support. See fig 4 and Table 1.

### NooElec NESDR SMARTee

This particular dongle is similar on paper to the TVMini above (frequency range and main chip usage). However, it does have TCXO making it less prone to temperature drift and also Bias T support for remote powering LNAs, There was also a Nooelec



Fig5 Nooelec Smartee SDR Dongle

as one another, the ARTEE was rebuilt from the ground up giving it a 3dB better noise floor than its predecessor. See fig 5 and Table 1

### NooElec Ham It Up Plus (Upconverter)

This up converter is housed in a heavy duty black box (hence the Plus) and is a high-quality RF (ULF/VLF/LF/MF/HF) converter for software defined



Fig6 Nooelec Upconverter

radio devices like the NESDR series described above. It works by up converting the above frequencies by 125MHz. This allows these frequencies to appear in SDR software. Most software also allows you to offset the frequencies in the software itself, to give a true indication of the frequency you are looking at. Ham It Up will also work as a panadapter for most radios and can be used for both receiving and transmitting.

Refer to fig 6 and Table 1

**RTL-SDR.com (Version 3.0)**

Named after its web site, this particular dongle supports DVB-T television, DAB radio, FM radio when in Quadrature Sampling mode and HF when in what is known as direct sampling mode. It also has a TCXO making it less prone to temperature drift and also Bias T support for remote powering LNAs.



**Fig7 RTL-SDR.COM Dongle (Ver3)**

Older RTL-SDR units predominantly use the R820T chip. This dongle uses the newer R820T2 chip, which has slightly better manufacturing tolerances. The R820T2 is produced in a

factory with higher quality silicon which allows for more reliable chips. A side effect of the better silicon is overall slightly better and more stable sensitivity across manufacturing runs compared to the R820T, and less PLL lock problems at L-band frequencies.

Overall this dongle offers the best bang for buck compared to the others I have reviewed in this article. And their website (RTL-SDR.com) is second to none when it comes to guides, specifications and downloading software. See fig 7 and Table 1.

Make/Model	Frequency Range (MHz)	USB IC/ Tuner IC	TCXO Clock	Cost Approx \$US	Bias T
Hauppauge TV Dongle	22 to 948	RTL2831U/ R820T	No	< \$20	No
NooElec NESDR Mini 2	25 to 1750	RTL2832U/ R820T	No	< \$20	No
NooElec NESDR SMArttee	25 to 1750	RTL2832U/ R820T	Yes 0.5ppm	< \$26	Yes 200ma
NooElec Ham it Up (up converter)	300Hz to 65MHz (300 to 6GHz in pass through mode)	125MHZ oscillator	Yes 0.5ppm	\$60	NA
RTL-SDR.com	500KZ to 1766 MZ (500Kz to 28.8MHz in direct sampling mode)	RTL2832U/ R820T2	Yes 1.0 ppm	\$25	Yes

Table 1 SDR Summary Table

**SDR Software**

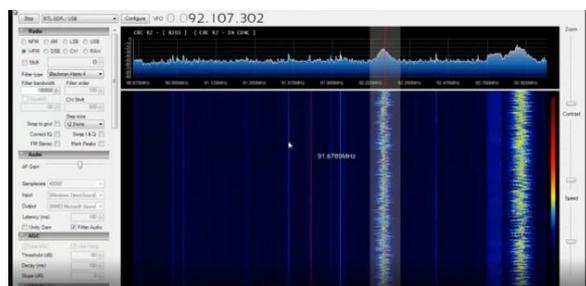
There are 5 major software choices when it comes to operating cheap SDR dongles as general purpose receivers. they are as follows:

- SDR Sharp

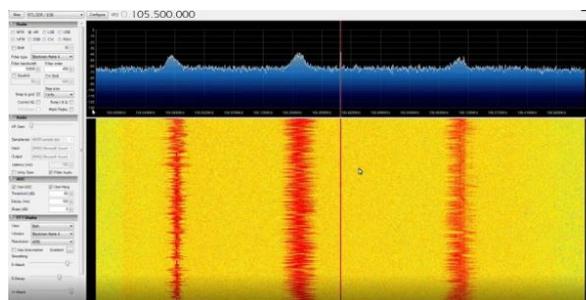
- SDR Console
- HDSDR
- GQRX
- SDRUNO

All of the above will give you a spectrum Analyser to look at the complete band, with the usual controls (similar to that outlined for the WR1000 SDR) with the addition of a waterfall diagram showing how strong a signal is by its colour (reds and oranges being stronger, blues and greens being weaker signals). Waterfalls also give you a time line from the current to time that’s past. This is handy to identify sporadic signals on a particular frequency, rather than broadcasting continuously like a radio station for example. See figures 8 & 9

Of these five, SDR Sharp software is by far the most popular. All of the dongles in this article will operate as an SDR, using this software.



**Fig8 SDR Sharp Main Menu Screen Shot No1 Showing Wideband FM (WFM) Signal**



**Fig9 SDR Sharp Main Menu Screen Shot No2 With Emphasis put on Waterfall Screen Shot**

If you combine it with the RTL-SDR.com dongle (recommended), you’ve got the best of both worlds, as this site has an extensive guide on how to download all relevant software correctly and how to set up your SDR.

In the next article (Part 3) we will look at some of the more upmarket SDRs and a typical SDR Transceiver used for Amateur Radio, Along with Particular Purpose Software. For example to decode digital radio signals.

Author Bruce Williams

## The dbx 117 (& 119)



'The other day' I thought it was about time to resurrect a dbx117 Decilinear audio compressor expander. The church I attend, like everywhere else has to contend with the current Covid19 restrictions, which means livestreaming masses for people to watch at home. I usually run things at the Sunday mass, however during the week others with all but zero sound system experience run the show – to give them a reason to legally (covid19) be in the church. (General parishioners are currently a no-no, only those involved)

Unfortunately there can easily be a vast difference in the sound levels that come from an energetic priest compared to that from a quietly spoken lady doing the readings. Of course the mixer has to be set to accommodate the louder without overload, this then leaves the quieter ones to get lost in the background. And with skilled operators few and far between, that tends to lead to a less than optimal webcast.

Our recently acquired Yamaha mixer has compression on several channels, and that is used quite a bit to tame things down, however some of our quieter readers (that also stand too far back) quite often need the system gain taken to the point of imminent full on feedback. If I'm there I tend to keep a finger on that slider to get sanity back into the settings as soon as possible. (And recover from any 'oops' moments)

This just leaves the weekday services that are usually run with the mixer unattended. So how about if I put some extra compression on the livestream feed?

Yes I can add a few digital effects to the sound within OBS studio that we use, however they are a bit crude in implementation, and stepped level changes are sometimes observable.



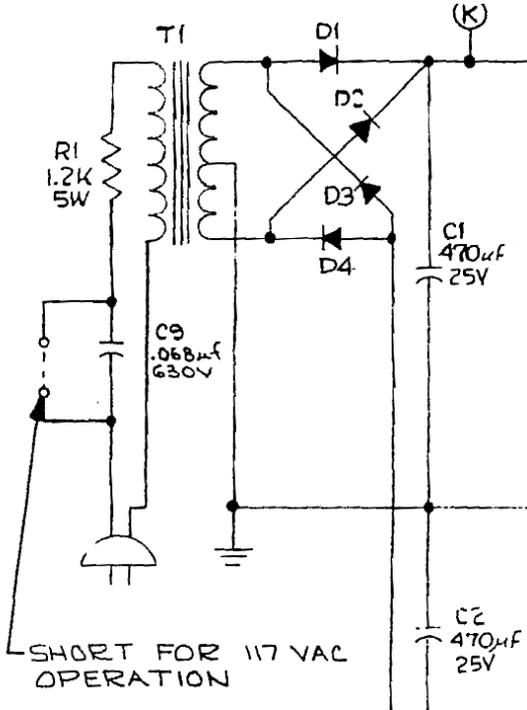
When I received the '117, the power plug had been cut off, I think it was acquired at a hamfest?.

Even if it still had its plug, the power lead really needed replacing as it used the old figure 8 lamp flex which is no longer accepted for mains use.

These days **all** mains leads have to be double insulated, no problem, as I literally have a wardrobe full of leads.

However there was this unlabelled link plug, and the fact that there was nothing written on the back panel as far as mains voltages were concerned.

These dbx units are made in the USA, so one should check that it will run on our 240V mains. The original cord didn't give me any confidence this thing was 240 ready. The same as a US 120V Sony amp I was given, that had 'paid the price.'



The transformer only has one primary winding, with no tap, so on the surface this is a one voltage device, or so one would think, but no, it can handle 117 or 240V. Next to the transformer is a 1.2K 5W resistor, with a capacitor of some sorts on top. The pluglink either has just the resistor in series with mains active and the transformer, or both resistor & cap in series. I initially thought the cap was a resistor as it measures 14K ohms; however it is supposed to be a .068uf cap – the writing being all but illegible. (I'll have to replace it)

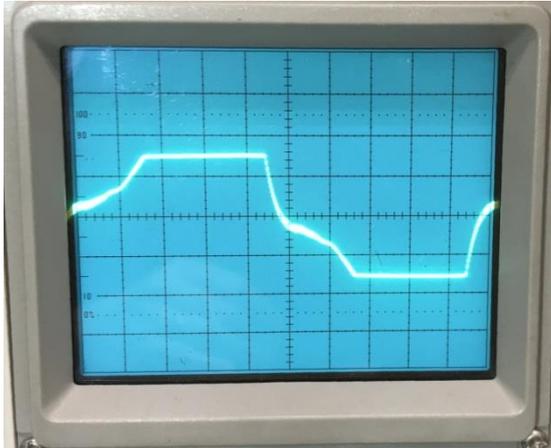
I later discovered to my surprise that the owner's manual was both available on line, and includes a circuit diagram.

This manual is a bit of a revelation to me, I'm so used to seeing a pile of warnings about equipment being user unserviceable, and that the owner should NEVER take the top off.... We've all seen this carry-on.

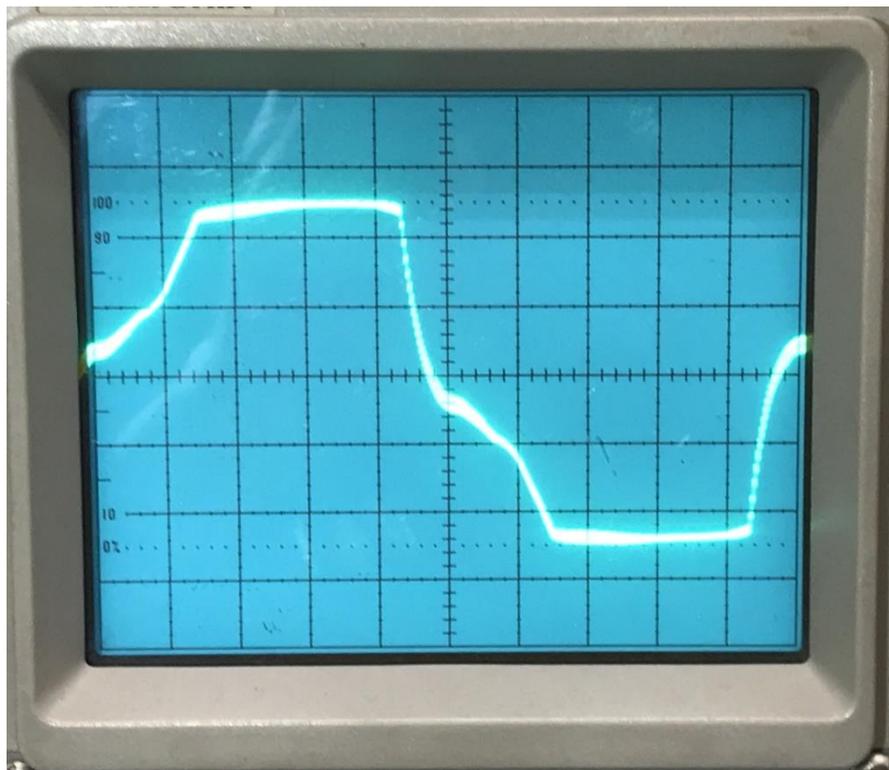
By contrast the dbx manual encourages you to open it up and modify it; they even give you a few examples of simple changes to get extra dynamic range etc. and how you can extend it to do quite a few tasks beyond what it does as standard. They also describe the differences between this, the 117 and the slightly later 119 that I also have.

The transformer does not see the full mains, in fact if it did, it would be quickly destroyed. The transformer is run in saturation for the greater part of the mains AC cycle.

◀ This is the output, -15V to +15V, all but immune to mains voltage changes. So why?, well this is how the DC supply rails are regulated. It has nice and clean plus/minus 14V rails for the amplifier modules without any of the usual IC regulators.



I'd all but hazard a bet that this will outperform the power supplies in most consumer audio gear. Mains surges get all but sopped up by the resistor/capacitor front end, then totally squashed by the transformer. Nothing exceeding these voltages can get through as the transformer's core is already saturated.



◀ This is the mains input waveform, as seen on the primary winding, with the scope set to 50V a division.

Normal, 240VAC mains, extends to plus and minus 339V peak, so most of this is lost in those two input components.

If you look closely you'll see that the top is not completely flat, it does arch up a wee bit, however this extra causes no extra output, as the core cannot accept any more magnetic energy, this extra is simple being taken up by the primary windings DC resistance, and then lost as heat, as is any spikes.

The biggest problem here is if the transformer fails, no off the shelf

part will do as a replacement, it has to be this exact part from dbx inc, otherwise a rewind is your only other option – short of replacing the whole power supply with one that includes a pair of voltage regulators.

One would think this is awfully inefficient, however it's not that bad, most of the mains input voltage is lost in the 0.068 uf capacitor, not as heat, but taken up in capacitive reactance. The whole thing runs cool, unlike the shunt Zener's used in a lot of Hi-Fi amplifiers.

I'm quite tempted to replicate this in some of my own designs, it's quite simple, and likely to last for years without any grief, unlike all those switchmode supplies that are now so common our gear. The larger ones in computers etc. are not bad, they usually run for years without issue, no, the ones I am on about are the really small types found in LED lighting systems etc. Most of the time when a LED light fails, it's usually the power supply. LED's should last thousands of hours if not abused, however most LED lamps unfortunately die much earlier. The biggest issue in implementing this design is having to rewind my own transformers to suit. These are definitely NOT an off the shelf item.

In my younger years, 99% of the transformers I used came from old TV's and the odd radio; I would pull them all apart and rewind them as required. A big transformer out of a TV left for dead the small one that came with my slot-car set. Even if I did something ill advised the big transformers wouldn't even cough.

As for the dbx box, it looks like I'm going to have some fun; I'll have to add an accessory socket so I can connect an Arduino to really control things.

For more on Ferro-resonant Transformers, [http://www.electroncoil.com/ferroresonant\\_transformers.php](http://www.electroncoil.com/ferroresonant_transformers.php)

And also have a look at “**Practical Considerations - Transformers**”

<https://www.allaboutcircuits.com/textbook/alternating-current/chpt-9/practical-considerations-transformers/>

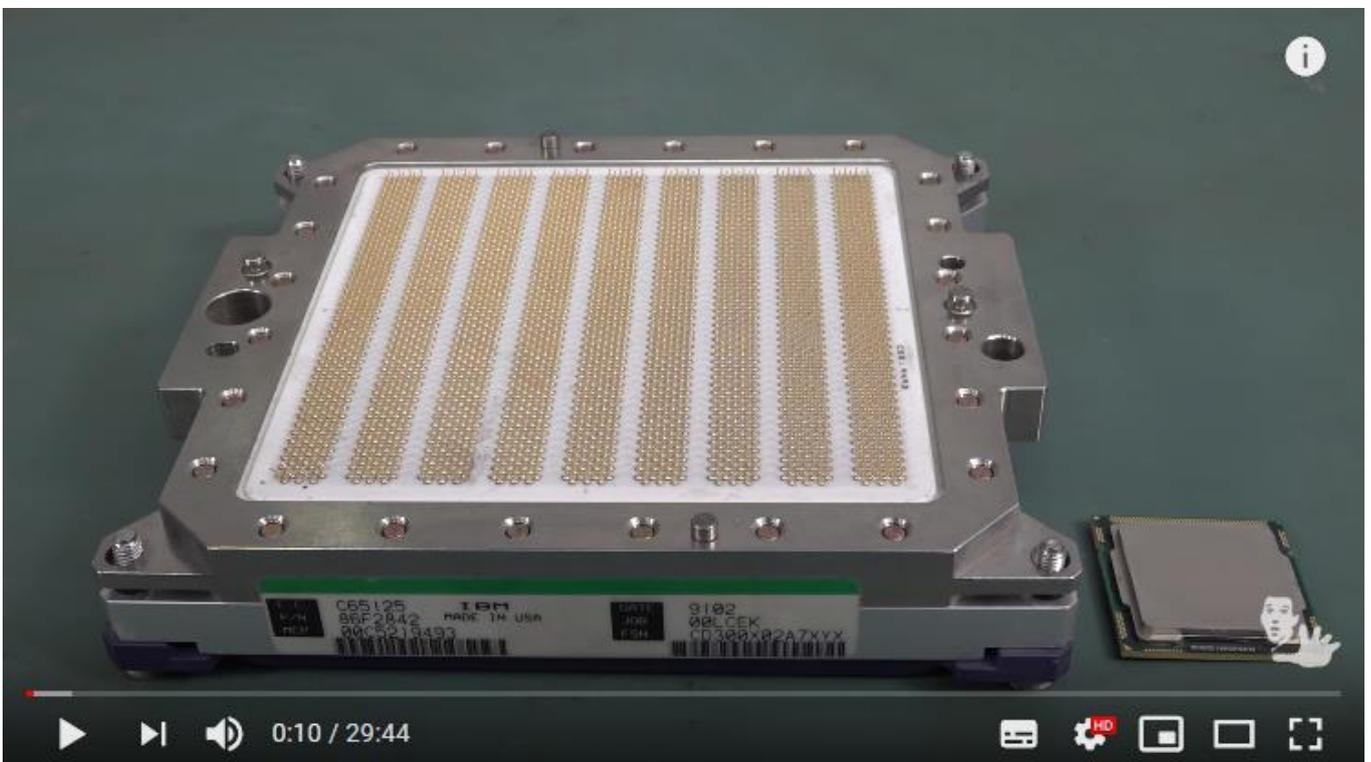
*Paul VK3TGX*

# Interesting YouTube Videos



The Past, Present, and Future of EV's

<https://youtu.be/Vm7l3YxEF8g>



AMAZING \$250,000 IBM Processor TEARDOWN!

<https://youtu.be/xQ3oJlt4GrI>

(From 1991)

# Zetron system adopted by Metro Trains Melbourne

Monday, 29 April, 2019



*Image credit:*

*@stock.adobe.com/au/TTstudio*

[Metro Trains Melbourne](#) will roll out Zetron technology at its train control centre to improve transit communications.

The [Zetron ACOM Command & Control system](#) will be utilised as the new primary communications platform for the train control centre at MCS, METROL DRS and Flinders Street Station in Melbourne.

The system will allow Metro's drivers, operations staff, station staff and others who help keep the train system running each day to communicate more efficiently, through both voice and data.

Metro's communications systems are being renewed as the metropolitan rail network undergoes a significant transformation. The new systems will support a steady growth in passenger numbers, significant operational and technological advances relating to managing transportation infrastructure, and higher traffic volumes.

Metro is one of the region's largest metropolitan rail services, operating 220 six-carriage trains across 965 km of track and transporting 415,000 passengers each day. With 15 lines, 219 stations and services seven days a week, Metro provides a seamless transport solution to keep passengers connected and on time to their respective destinations.

Zetron's ACOM Command & Control system is a robust and highly configurable communications platform, enabling it to easily adapt and evolve with the requirements of even the most complex and diverse communications centres.

"A transportation system as large and busy as Metro's demands a system that provides complete communications interoperability, efficiency and geodiversity," said Ranjan Bhagat, Vice President and General Manager, Zetron Australasia.

"The ACOM Command & Control system was designed specifically to give transportation organisations like Metro the ability to successfully manage massive activity volumes across multiple disparate channels without missing a beat."

Read more: <http://criticalcomms.com.au/content/radio-systems/news/zetron-comms-adopted-by-metro-trains-melbourne-807673215#ixzz5mq73AzhF>

# Purchasing Fraud

I would like to enlighten you on a purchase and subsequent refund that were fraudulent (not by me) that I came across recently. I do a lot of purchasing for work. I had to buy 3 new Android mobile phones for a research/student project. This particular phone is in run-out model so was a bit difficult to find. In the end I was able to purchase 3 units (\$169 ea.) from a popular supermarket. Two were in shrink wrap but one wasn't. It did have all the warranty seals, in place, so I didn't think any more about it until I got back to my desk.

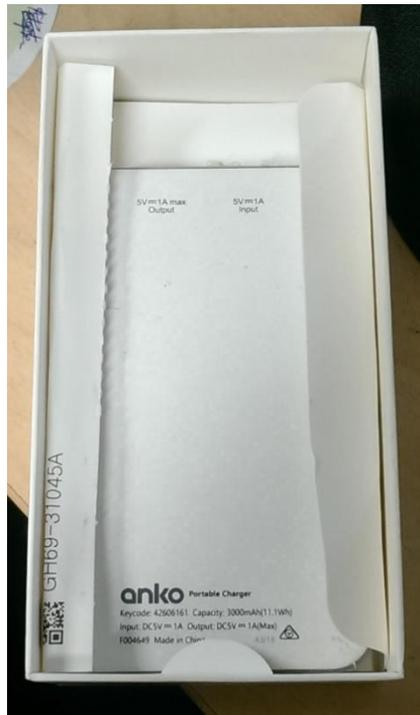
Looking closer at the dodgy package something didn't seem quite right. The packaging was dirtier than I would have expected with some extraneous tape or glue in a couple of places. Having a closer look at the warranty seals one was perfect but the other was suspect. Have a look at the pic below. I was the one that slit the seal to open the box. See how it is crinkly and not smooth like it should be.



The photo below is what should have been in the box as well as the handset. The following is what was found in the box (see tryptic pics). There were three layers. The top one was just cardboard packaging – this should have been the phone handset. The middle layer was a 3000mAh USB power bank. I don't know if it worked or not but it was about the right weight of the phone. The power bank was glued to the cardboard with hot melt glue. The bottom layer was 6 tea candles – this should have been power adapter, battery etc. Someone went to a bit of trouble to get a free mobile phone. It may have cost them a power bank, 6 tea candles and some hot melt glue.

Yes - I did get a refund.

Michael VK3GHM



# As Seen on Google Teleconference

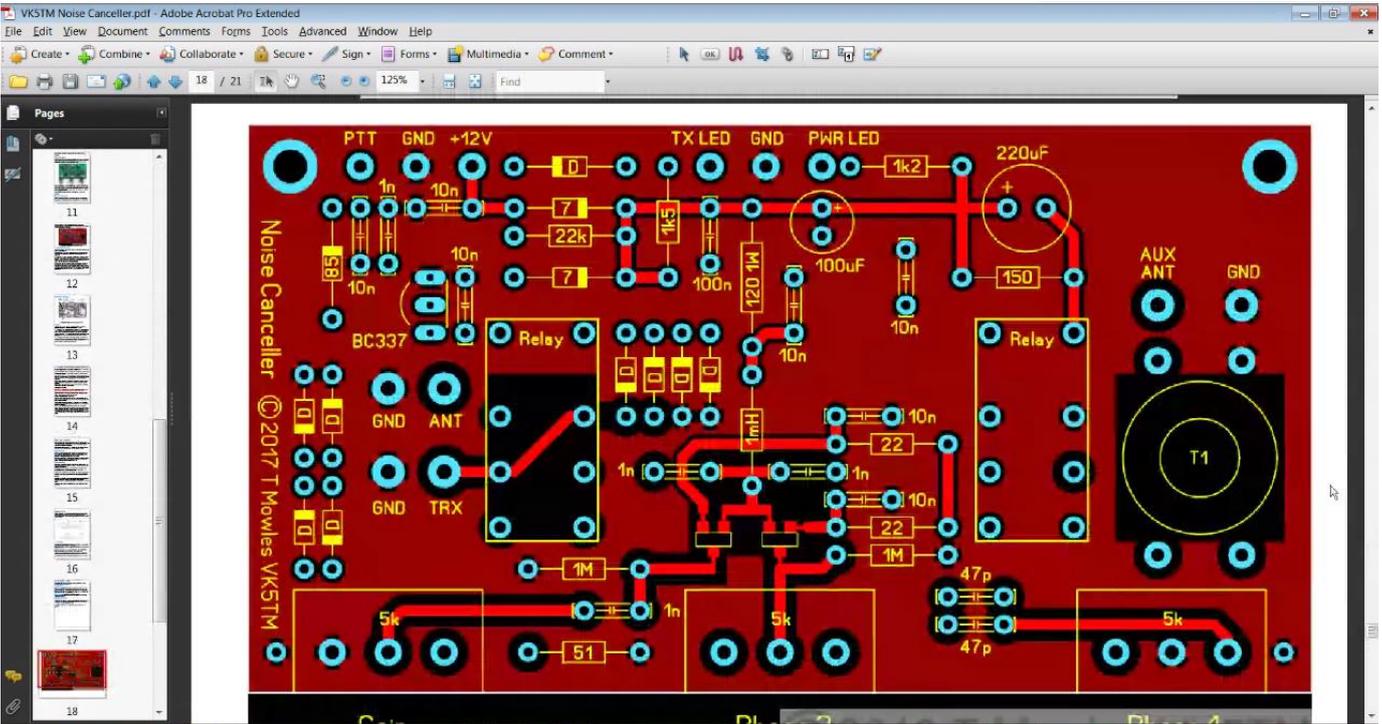
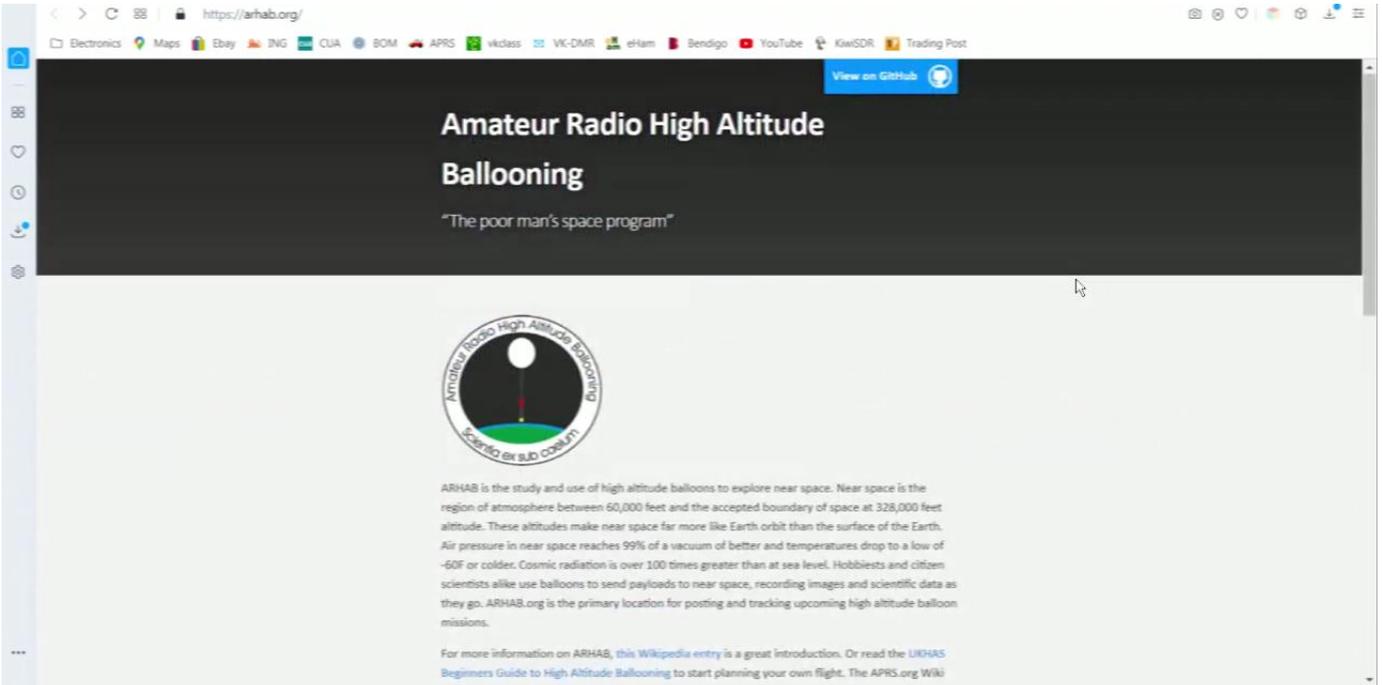
General Meeting 17/10/2020 – Join in or miss out!



A screenshot of the ARHAB website. The page title is 'AMATEUR RADIO HIGH ALTITUDE BALLOONING' and the main heading is 'MISSION ANNOUNCEMENTS'. There are links for 'Submit mission information', 'Flight Successful', and 'Flight Cancelled'. A search bar is present with a dropdown for 'All Groups' and a 'Filter' button. A URL bar shows 'http://WWW.ARHAB.ORG'. Below the search bar, it says 'Showing future flights and flights 10 days back.' and 'Listing: 0 of 1039 missions'. A table with five columns is displayed:

MISSION DATE / TIME	LAUNCH LOCATION	CALLSIGNS FREQUENCIES MODES	WEB PAGES, EMAILS and TRACKING	ADDITIONAL INFORMATION
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Keep an eye out for the club's meeting links in your email – Don't miss out, Join in



# 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.~~

**All physical meetings suspended due to the coronavirus restrictions**

## Office bearers

President	Micheal Van Den Acker	VK3GHM	Web Master	-	-
Admin Sec	Bruno Tonizzo	VK3BFT	Magazine Editor	Paul Stubbs	VK3TGX
Treasurer	Albert Hubbard	VK3BQO	Property Officer	'committee'	
General 1	Bruce Williams	VK3BRW	Assoc. Secretary	Bruno Tonizzo	VK3BFT
General 2	Paul Stubbs	VK3TGX			

## 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 - TBA  
 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)  
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