



# GATEWAY

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

**April 2021**



**Australian Botanic Gardens visit**

**Are You On Frequency?**

**Roadkill Radio**

**And More**



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

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## Event Queue

### April:

- 2<sup>nd</sup>      Prac/Natter night, via video link, see club emails
- 16<sup>th</sup>     AGM & General meeting, in person, Guide Hall, Remember your mask!
- 25<sup>th</sup>     ANZAC day AM / CW, from 9am on 7125KHz AM - Courtesy WIA

### May:

- 1<sup>st</sup>      Harry Angel Sprint 10:00 - 11:46 UTC - Courtesy WIA
- 7<sup>th</sup>      Prac/Natter night, via video link, see club emails
- 21<sup>st</sup>     General meeting, in person, Guide Hall, Remember your mask!
- 29-30<sup>th</sup>   CQ World Wide CW WPX Contest - Courtesy WIA

### June:

- 12-13<sup>th</sup>    VK SHIRES - Courtesy WIA

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

## President's Paragraph, Postulation or Preamble.



Hello members,

A new month and another face to face meeting with our AGM and GM being held on Friday.

With the uncertainty of snap lockdowns, closed borders and the vagaries of politicians the last 13 months have been difficult for the club and its members.

During the current term this committee has brought you regular Gateway magazine issues, thank you Paul and all contributors. Face to Face meetings where they were allowed. Virtual General meetings and Natter nights. Get together for morning tea/lunch at Emerald and the Cranbourne Botanic gardens. We tried to be involved with the Train & Hobby show but were thwarted again by Covid-19. The GGREC Hamfest was a go and then it wasn't, mainly due to the size of the venue and again Covid-19.

For this Fridays meeting please have a think if you have the time to support the club by nominating as a committee member. The club has difficulty filling these positions every year and Covid-19 has not helped. Bring your own cup (preferred) or we will have disposable one's for you for tea and coffee.

At last month's meeting we had some surplus items from members, after fervent activity and scrambling to find some useful bits and pieces in 4 plastic tubs the remainder was taken to eWaste for recycling.

The 10am morning coffee chat is still happening on 70cm. Natter/tech nights will remain virtual for the moment. The last one was cancelled due to Easter. Speaking of which I hope you enjoyed yours and didn't eat too much chocolate or too many hot cross buns.

Does anyone know of a larger under cover venue that we could use for a Hamfest? Probably a school gym in size would be ideal. Trestle tables would then be an issue. Please put your thinking caps on.

There is a bit of maintenance to be done around the shack, antennas, repeaters, cleaning, etc, so we will talk about this to arrange a working bee or bees. It will probably take more than one.

Paul needs articles for inclusion in Gateway magazine. If any members have a suggestion for a place to go for morning coffee or lunch, or any other activity that we can share please send them to the committee – especially now that we can go places. [committee@ggrec.org.au](mailto:committee@ggrec.org.au)

That is all for now. 73s

A handwritten signature in blue ink that reads "Michael". Below the name is a long, sweeping horizontal flourish.

VK3GHM - April 2021

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It is published in good faith for its members and other interested parties. The articles here in do not necessarily represent the views of the committee or the membership.  
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If there is an issue with copyright please contact the editor



# From The Editor



## VK3RGW woes

Recently the clubs 70cm repeater was updated to use the newer 7MHz offset.

This was done to get the repeaters input out of the LIPD spectrum. The repeater had been seeing a slow rise in the amount of interference it was getting from LIPD devices. Initially we added tone access to keep the junk out, however this solution was no longer cutting it so a working bee was had to move us to a 7MHz split.

However there was more to it than just changing the offset, the repeater moved to a new allocation (for both Tx & Rx).

The new frequency appears to have affected the radiation pattern of the antenna, apparently it was specifically ordered with the original frequencies. Normally an in-band move should not upset things, however something has happened. Normally I didn't have any real issues accessing it, however now I quite often suffer multipath distortion. I have seen this once on receive in the past – now it's more like a 50/50 chance on Tx, Rx is fine, 5&9 all the way.

Other suggestions were I was off frequency, this I tweaked a bit, however the Kenwood radio I'm using is incredibly touchy on the adjustment trimmer, so a few hundred hertz off was the best I could do. This had no effect, nor did changing to a different radio, so it's not that.

I tried accessing the repeater with a horizontal beam, not very successfully, well at least I could now monitor how I sounded, very bad at times, so yes, I'll agree with the multipath suggestion.

Now cross polarizing antenna's is a recipe for disaster (theoretically 100% loss) so how about a dedicated vertical beam pointed at Cranbourne. Years ago I acquired a commercial stainless steel beam, it had sat for years unused, I had assumed it was made for a commercial band, not 70cm, however testing proved it was fine, with no apparent reflected energy.

Now this thing is heavy, it was designed for horizontal end mounting, So I temporarily mid mounted it to a piece of angle iron, with an right angle bracket and some stainless steel hose clamps, so it could be spaced away from the antenna pole. There was a spare coax just waiting, however its length dictated a low position – that was fine as this was for a quick test only. The angle iron is far too flimsy, it wobbled quite badly in a mild breeze, and the coax was connected with a BNC adapter with no waterproofing. As mentioned, just for a test on the next morning's net, then to be pulled down before the wind brought it down, or the rain killed my adapters.

And the results – well there were almost none, I called in at 10:00 and nothing - nobody....

(About 15 mins later I did have a quick QSO with VK3FKAM, thanks)

Oh well this will all have to wait for another day.

*Paul VK3TGX*

# Visit to the Australian Botanic Gardens Cranbourne

The day did start off with a light shower but I made sure that I packed my umbrella and gumboots in the car for the trip to Cranbourne to visit the Australian Gardens. I didn't want to miss this visit which had to be rescheduled due a short lockdown.

By the time I arrived, the rain had almost finished. I parked my car next to Ivan VK3ARV's Ute just as he was getting out of it. We joined up with Helmut and Dorothe, who had already parked nearby and by the time we wandered into the Café we were joined by more GGREC members and wives. I had booked enough spots for us to comfortably spread out over two tables and enjoy our brunch or coffee and cake while enjoying the view over the gardens.

There were many conversations going on and moving from table to table allowed us to catch up with everyone. It had been quite some time since the Australia Day BBQ so we had a lot of catching up to do. Pat Pavey VK3OZ told us about her fundraising effort that was going to be held on the 1<sup>st</sup> of May in Tooradin so we decided that we would have a coffee morning there as well.



The light rain had passed so some of us ventured out for a walk and explore the gardens along the many well laid out pathways. The water features made a fine backdrop for a group photo and the lush green gardens looked fantastic as we walked around. I had seen the gardens feature on the ABC's Gardening Australia show on the telly so it was great to explore it with excellent company. I'm sure we will return again soon.



Many thanks to Pat Pavey, Mike Ide, Ivan Blezard, Helmut and Dorothe Inhoven, Bruce and Christine Williams, Ken and Leone Thomas and Klaus and Tess Illhardt for coming along to make it a great day out.

Bruno Tonizzo

VK3BFT



# Are You On Frequency?



In the early days of radio, you would use a wave meter to determine your frequency, this one being a General Radio Co. Precision Wavemeter Type 224R, ca. 1928, probably quite expensive in its day. By law at the time every amateur had to possess something to measure their frequency.

If you were lucky, yours would also include a crystal calibrator.

By today's standards, they are about as accurate as trying to determine the voltage of a 9V battery with your tongue.

Otherwise a nice addition to one's home museum.

These days modern digital HF radios are that accurate that you can tune to a particular arranged frequency in advance waiting for an expected call, and they will come up spot on, no fine tuning required, try that with an old FT101 or older, no, you would have to tune around to find them.

This has not entirely gone away, especially if you are into microwave communications, particularly if you want to try SSB up there. By the time your radio's local reference oscillator has been multiplied up to the GHz, the smallest of errors will mean your off by several KHz meaning you can be pointed at the other station, well within range, plenty of power but not be able to make the QSO.

On a related subject, time, modern digital weak signal modes quite often require your computers clock to be spot on, unfortunately, spending several thousands of dollars may give you a fast and modern PC, but it's internal clock will probably be crap. They assume an always on internet link, however to me, that kind of defeats part of the hobby, being able to set up a field station on your own with no external 'help', be that 240V power etc. etc. etc.

For part of my working life I was in a Telstra lab in Carlton where they had an atomic sourced master clock to sync up all their test equipment. The actual atomic sources were over at the Clayton research labs, now sadly gone. The clock was sent out on dedicated lines to anyone who needed it. They even had a dial in service that would sync up a custom crystal oscillator you carried with yourself, allowing for very precise field adjustments.

In the analogue days of telephony, coax cables were used to carry hundreds of conversations between capital cities etc. This carrier equipment worked just like an SSB radio, every voice channel was allocated a 4KHz slot, and they were all stacked up on top of each other in these 4KHz slots. For this to work, very stable and precise references were used to ensure that once a call had being brought back to the normal audio range, if sounded spot on, no SSB type Donald duck talk etc. Hence the remote dial in two tone frequency reference service.

'The other day', when I was having trouble accessing the clubs VK3RGW repeater, the question was asked, 'Are you on frequency', mmm, good question, I'm sure I was fairly close, but to keep them happy, I better check.



These days I use a portable frequency meter, a Thurlby Thandar PFM1300, which goes from 5Hz to 1.3GHz, a somewhat better instrument than my old Dick Smith kit 1GHz counter. The latter has a horrible internal reference; it wanders all over the place, so is only good as a general check that you are not ridiculously off frequency.

I have wanted to fix that one for a while, however it has two internal references, one for the lower 80MHz range – that one is easy, however it has a different oscillator for the 1GHz range that is a lot harder to replace.

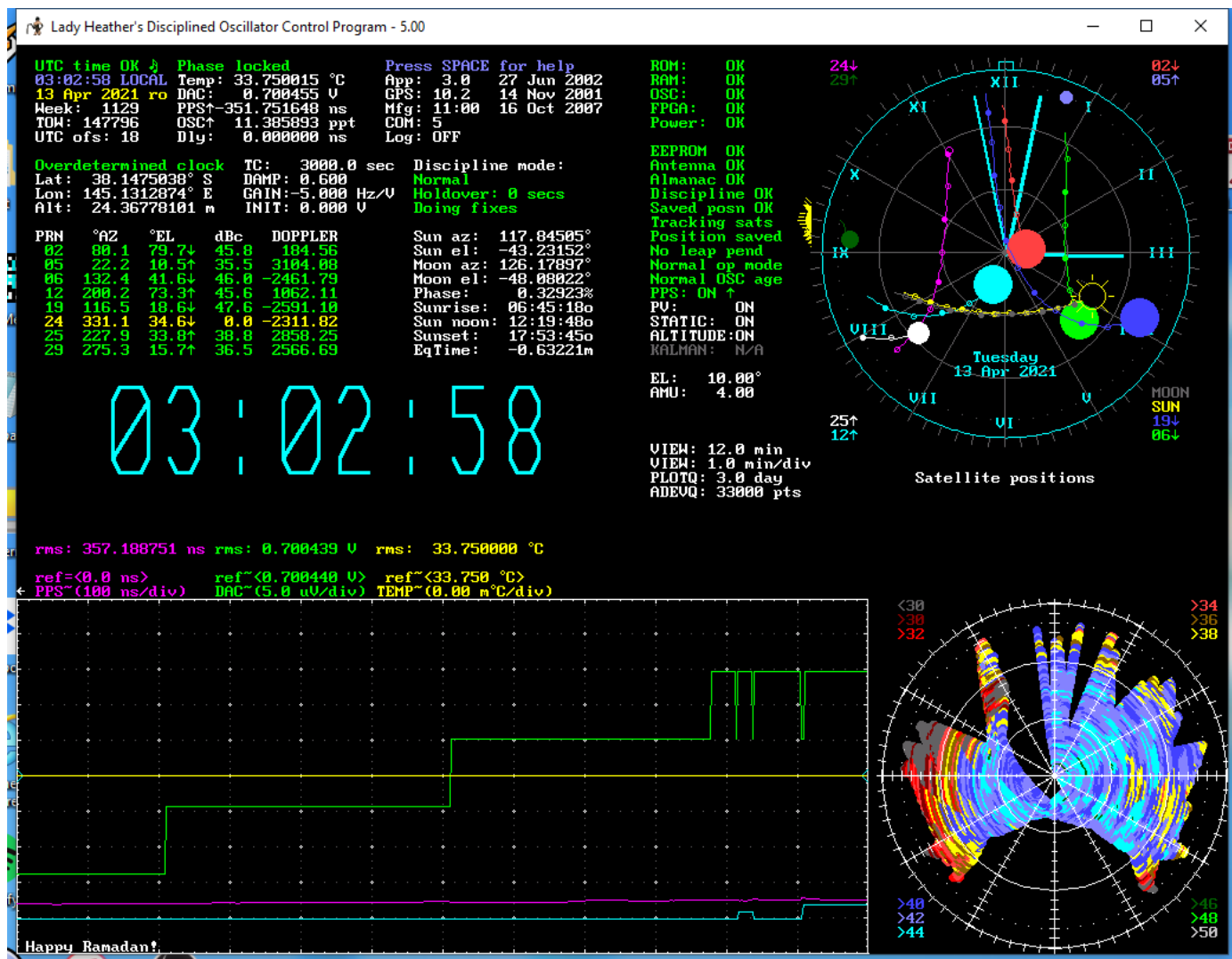
Luckily the TTI PFM1300 has none of these problems, so it has become the go-to box in my shack.

The rubber duckie antenna usually picks up enough signal to give me a stable reading, much safer than a direct connection, as an accidental 25W would surely kill it.



When working at the Telstra 'Equipment Services' repair shop, I was bitten by the frequency accuracy bug, and started collecting any relevant kit, which includes my last bit, a Trimble Thunderbolt GPSDO, or GPS Disciplined Oscillator, the red fronted bit of kit on the top shelf.





This is a screen shot of a program I use to monitor the Trimble box, boy does it show a lot of info about GPS, where the satellites are, and a whole lot more. I should read the manual and learn a lot more. Recently I read a post from a much better equipped owner that said about changing a few parameters for better stability – now it's even better. I was somewhat surprised that the Thunderbolt does not do this optimising itself. Anyway one of these Trimble box's would make an excellent addition to most shacks.

The purpose of all this kit is to produce a stable and accurate 10MHz reference signal that can be used to synchronise your 'better' lab style gear. Also some of the latest up market transceivers have 10MHz reference inputs. For many years 10MHz has been adopted as the go-to reference in professional labs, so picking up second hand gear, like frequency counters that accept the 10MHz standard is fairly easy.

The lower item is a HP 105B Quartz Oscillator, These were 'yesterdays' lab standard, with a 5MHz (plus 1MHz, & 100KHz) outputs. Internally it does use 10MHz (it's the later upgraded 'B' version) internally, but in its day, 10MHz was yet to come into regular use. One of these days I'll modify it for 10MHz out, but for now, how I use it, 5MHz is fine. If I run it up against the Trimble GPSDO, I can see the jitter in the GPS derived clock – hence my earlier comments about the changes to the GPSDO's settings giving a more stable output, without this to compare with I'd never have known. Its long term accuracy is not as good as the GPSDO, however its short term stability is far better. If I had to choose a reference for a microwave system, I'd probably use the HP – after manually trimming it to follow the GPSDO.

I'd like to make up a box to monitor and log the differences between the two, that way I can make more GPSDO tweaks, and know if I'm going in the right direction.



So what use is this if I don't have any of the flash gear that takes 10MHz I hear you say? Well there are more ways one can use this signal, the first is to calibrate the oscillators in your regular frequency counters, just shove it into the main input then adjust the trimmer in your counter so that it says 10.000000 MHz.

Then there is using it with an oscilloscope. Put the scope into X-Y mode, with the GPSDO on one axis, and use a scope probe to sniff the signal from the oscillator your trying to adjust, into the other channel.

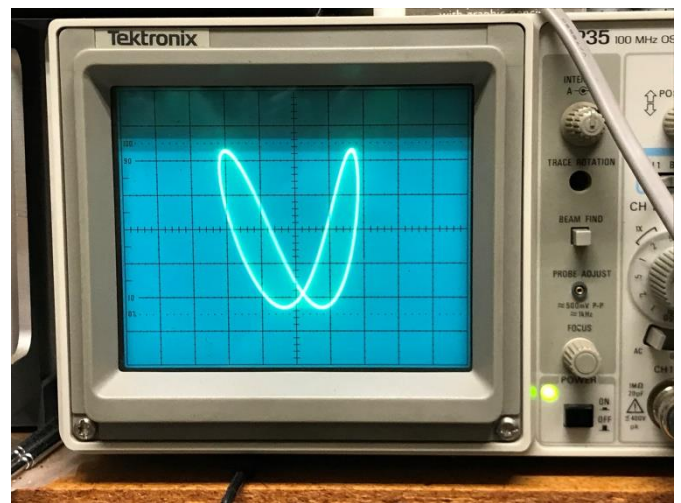
Here I have a 5MHz oscillator I acquired, that was in need of adjustment. Now insert an alignment tool and adjust for a still image on the screen.

[https://www.dropbox.com/s/bv9tfett1b9ixpb/IMG\\_1917.MOV?dl=0](https://www.dropbox.com/s/bv9tfett1b9ixpb/IMG_1917.MOV?dl=0)

Try this link for a quick video of what I'm talking about.

In this case as there is a 2:1 ratio between the two signals, I get a 'double loop' image. If it was a three to one, then you get the ABC TV logo.

If you draw a line across the very top of the image, so it's just touching, then do the same down one side you will see two touches on the top – the 'Y' axis, and one on the vertical, or 'X' axis, showing you have a two to one ratio.



Quite a few CRT based scopes will have difficulty accepting 10MHz on the Y plates, most scope tubes are optimised to take high frequency drive on the X, (vertical) plates, whereas the larger plates used on the Y, (horizontal) axis present a bigger load. In normal scope usage, this is the horizontal sweep that is normally a fraction of the vertical signal, so in 'normal' use, not a problem. They could put in a bigger Y amp, but they usually don't. In the picture above I purposely put the 5MHz signal on the Y axis, to take some of the load of my scope. Otherwise you will have to just put up with a quite small on screen image; you'll still get the job done.

An alternative is to put the 10MHz reference into your scope's external trigger input (and select ext!) If the oscillator you are adjusting is on frequency, then it's waveform will sit still on the screen, otherwise if you are low, or high, the waveform will drift left or right.

It is not a good idea to directly connect to the oscillator, as this will inevitably change its frequency. In the above oscillator case, there was no trouble directly linking with a scope probe as the output is well buffered and any load will not have any effect on the frequency.

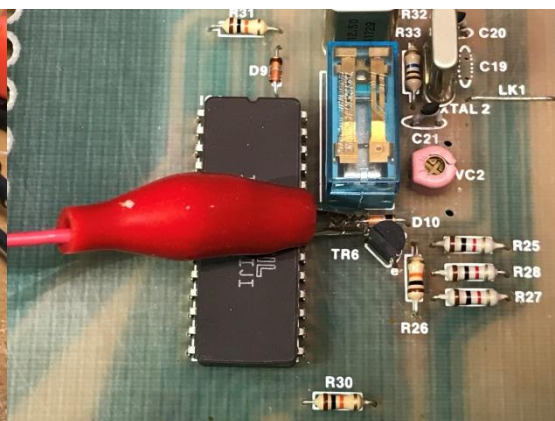
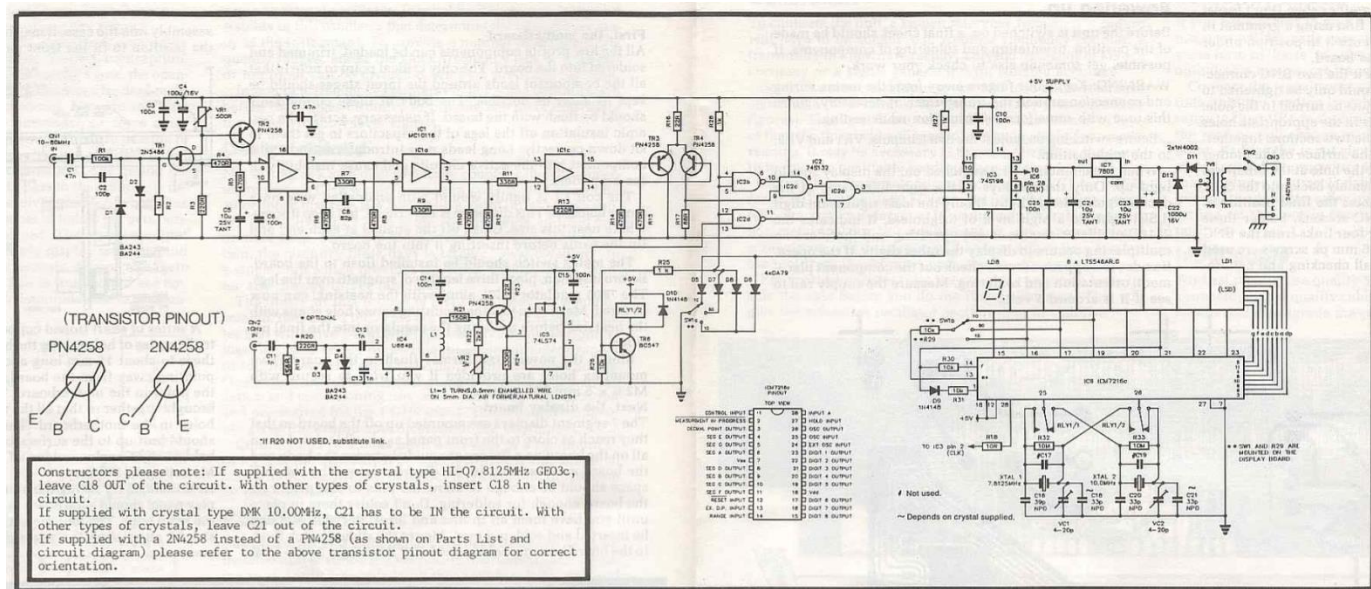
In the case of my TTI PFM1300, if I held a probe hook up against the back of the case near the frequency adjustment hole, then cranked up the scope to max gain I could just get a noisy but usable image that allowed me to adjust it without loading the oscillator, or even opening the case. Another method is to make a small sniffer coil; however I haven't been down this track.





In the case of my Dick Smith K-3437 counter, I had to get sneaky, whilst the 10 & 80MHz range is easy to adjust, just feed in the 10MHz, the 1GHz range is not so. The 1GHz range uses a separate oscillator to allow for the odd division ratio of the 1GHz pre-scaler, 64:1.

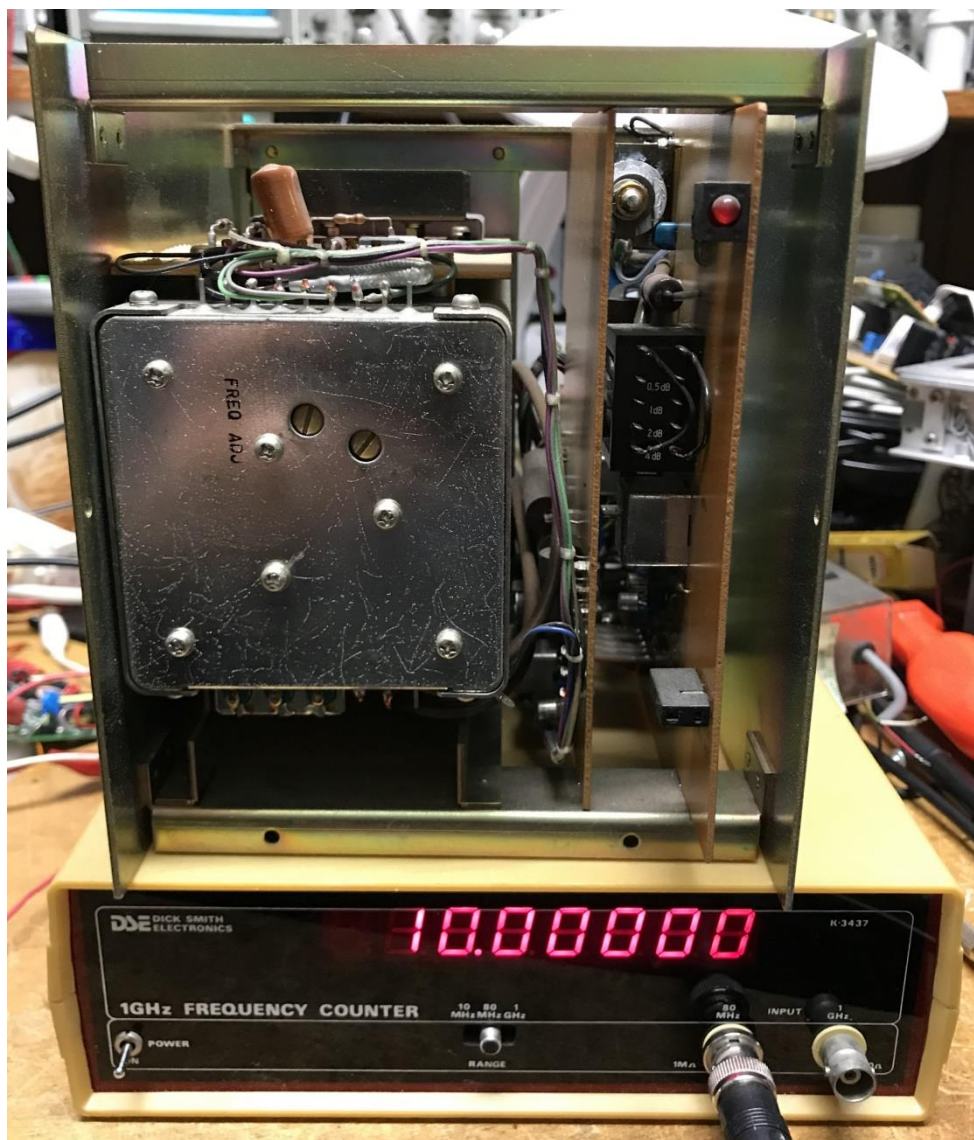
My trick is to select the 80MHz range, then force it to use the 1GHz range crystal. This is done by placing an earth on the anode of D10, operating RLY1



This will make the counter wrongfully display 12.8MHz, or rather it should, adjust the VC1 trimmer until it says 12.80000 and you're done. (The 1GHz input will not take a 10MHz signal)

In days gone by, one would adjust a crystal oscillator by lightly coupling it into a HF receiver, then beating it against a standards transmitter, like VNG, that used to live at Lyndhurst, or if conditions were right, WWV in America. So this does beg the question, why not do the same thing with a GPSDO 10MHz signal as your very own personal radio VNG? You'd have to get both signals about the same level, then just use a half decent HF receiver. When you are close the S-meter will start to pulsate up and down, then stay steady when you have it right.





Now this is a crystal oven! It's one of the old Telstra reference oven oscillators I mentioned earlier, pity they don't put out 10MHz, or a multiple of it.

I did figure out how to convert it to 10MHz using a PLL to drive a VCXO or Voltage Controlled Crystal Oscillator.

I'll have to resurrect it and see what this thing can do, now that I have something to compare it against.

Pity I don't have the circuits.

Below are some of my other related trinkets.

The first is a TV derived frequency reference, from the good old analogue TV days.



Second is a video distribution amp, they work great as 10MHz distributors. Next is probably the worst counter you could own, it uses the 50Hz mains as a reference – eek, EA what were you thinking. Last is a HP 5308A counter, pity it only goes to 75MHz, although it does accept 10MHz in on its back panel.

*Paul VK3TGX*



Thanks Ian VK3BUF



## Trouble With Hard Drives, pt 2

In part one, I told of the success I had with a dying laptop HDD in my radio shacks computer, and then my efforts with an Acer SFF PC. Well after several attempts I had to call time on that one. The standard recovery techniques were just not working. I tended to think there must have been some corruption to the various 'file rights' and that when Windows went to update the various modules, it couldn't as the file system was saying 'you cannot do that'.

I tried researching on how to return the Windows directory to its default state, however no luck was had. So I was on my own here, however going through the whole Windows folder and comparing it to a known good copy sounded like 'mission impossible' to me.

I found a very early image of the machine, made shortly after upgrading it from a fresh Windows 7 install to Windows 10. It had no software installed at that point, so the image was not much better than starting from scratch with a fresh Windows 10 install medium.

Normally one should be able to format your HDD and do a fresh install without Windows asking for a registration key number. Windows somehow is able to generate a unique ID from your computer's hardware, which is then stored on Microsoft's servers when you activate your copy of Windows. When you do a re-install, it finds the matching entry back at Windows HQ, so it knows that this machine was already registered, and automatically sorts all this out for you. However if you have changed any of the hardware (like fitting a SSD) then this 'previously installed' test can fail, meaning you better have the original install license number – a possible problem for me. However using that all but blank image solved that one for me.

In the end, not all Windows corruptions are worth chasing, sometimes you may get it apparently working ok, however you can also end up with a somewhat unstable computer with a pile of other hidden problems just waiting to bite you on the bum when you least expect it.

In this era of downloaded software, try and keep a copy of all the original install files you downloaded so that hopefully you can put it all back together when the need arises. In my case I quite often have programs that cannot be re-installed, either it was a one-time offer that cannot be re-redeemed, or the company that you must register the program with (or it won't run) has either disappeared, or has changed policies, and now demands that all future installs require you to pay an ongoing subscription for etc. Another one is company 'X' brings out a program for free, everyone loves it and installs it, then the authors say, "Hey, let's make some money", so the next version requests a donation ... then several builds later it's a pay up front only program, the earlier free versions being quietly expunged. A good example of this is 'Ham Radio Deluxe', where the current owners actively track down earlier free versions and have their lawyers issue 'take down' orders to anyone hosting it. (It's in the fine print, nobody reads)

So in my case image backups are the only way I can mostly fly these days.

I have developed a bit of an arsenal of sneaky tricks to get past all this, but it is not guaranteed.

In a twist to that, after fixing the laptop, Yes it boots way quicker etc., however the Firefox browser was awfully slow rendering YouTube videos, dropping frames etc. It turned out I was accidentally using a 32bit version, not the 64bit more suited to the 64bit Windows I was using. I traced it back to my 'software install library' where the version was 32bit. Firefox does auto update, so I end up with the latest, however that updating does not include going from 32 to 64 bit, you have to do that manually, a very painless and quick change, that keeps all your settings etc. (now if only Windows was this easy....)

*Paul VK3TGX*



# Roadkill Radio



Recently I was given this Hi- Fi tuner as a 'donation', unfortunately the wife does not see it that way, and keeps asking why they bring this junk to me. (a soft translation...)

It is a Hitachi FT-300, AM/FM radio.

The model number was the first thing that struck me, for it's bound to coincide with a Yaesu radio model, as Yaesu also use the FT series for their model numbers.

And whilst it looks quite bad, it actually cleaned up quite well. The strangest gunk on it being candle wax, there being quite a few spots on the front panel.



The wax being only on the front, not the top, so it must have spent some time sitting on its back, front face up, quite odd I thought. Anyway it all cleaned up quite well with the only lasting signs being to the knobs, and a small divot on the top edge of the front panel. This unit seems to have gotten off quite well, no rust or dints etc. Just up the road someone put out a largish Panasonic LCD TV, that only lasted a day before 'the local heroes' had their jollies with it. I had ideas of an early morning grab, test, and put back if dead session, however after it had been jumped on, its total junk.

The insides were pristine, none of the grass clippings and dirt (and wax) here. In the end the biggest problem was someone had cut off the power cord, which tended to make me think it had originally being put out on a council hard rubbish day, where the local copper collectors usually strike grabbing any cord they can find – how they make any \$\$\$ out of this I don't know.

So I hooked up a death cord, and it just worked! Even all the dial lamps came up.

The second picture is with it on my backyard 'garden' table, where I cleaned it up, then powered it up. I left it running there whilst I went inside – that was till I heard a noise – Oh poo it's raining – Yikes the lid is off and it's powered up by a death cord, quick get out there and kill the 240V. Luckily there was no wind to blow the rain under the veranda so the radio was dry. Quite often this table turns into a swimming pool after any decent weather events.

*Paul VK3TGX*



## Interesting YouTube Videos



Can you fit an Entire Windows App inside a QRCode?

<https://youtu.be/TS0y9roNH-s>



How Opportunity Shocked NASA Scientists

<https://youtu.be/W3OXnUnxUsM>



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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	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 431.425MHz Out 438.425MHz CTCSS 91.5Hz  
VK3RGW Repeater supports Remote Internet access (IRLP), Node 6794 **offline**.  
70cm Repeater Seaview VK3RWD, In 433.575MHz Out 438.575MHz CTCSS 91.5Hz **offline**  
Simplex VHF - 145.450MHz FM, Simplex UHF - TBA  
VK3RLP Beacons 1296.532MHz & 2403.532MHz (**currently offline**)

## Membership Fee Schedule

- Pensioner member rate \$40.00 Extra family member \$20.00  
Standard member rate \$50.00 Junior member rate \$25.00  
Fees can be paid by EFT to BSB 633000 - Account 146016746  
• Always identify your EFT payments  
• Membership fees are due by each April Annual General Meeting (AGM)

Magazine Articles to [committee@ggrec.org.au](mailto:committee@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)  
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