GATEWAY

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

August 2019

Recycle It – Power Savers

Fun With Counters, Pt 3

GGREC Hamfest

And More

Contents.

Note: - club meeting minutes are on the club website

Event Queue

August:

2nd	Prac night – club rooms
16th	General meeting – Guide hall
17th	Remembrance Day (RD) contest, see page 5

September:

6th	Prac night – club rooms
20th	General meeting – Guide hall

October:

13th	Yarra Valley Amateur Group HamFest (courtesy WIA)
19-20th	JOTA 2019 (courtesy WIA)
27th	Ballarat Amateur Radio Group, BARG Hamvention (courtesy WIA)

November:

23-24th	Spring VHF-UHF field day

The GGREC is planning to hold some Club Events. These are the Summer Field Day, the John Moyle Memorial Event and possibly the Winter Field Day. Dates will be forwarded at a later date. The Clubs participation in these events means that, besides having fun in setting up and operating our gear, we also promote our club. Furthermore the club is equipped with a complete set of portable gear. Why not use it? Please consider to be part of these events. The Committee of the GGREC

President's Report - Tony Doyle VK3QX

Hi Members,

Since the last GM the Hamfest has been and gone.

The event was a huge success with a total profit of over $2200.

Much planning went into the event but it wouldn't have been the success it was without the efforts of all those who put in tiring hours on the day.

A huge thanks again to all those involved.

Prac Night this month saw us testing the RGW repeater antenna again.

This time we were looking at Passive Inter-Modulation (PIM) noise and also desensitisation of the receiver by the transmitter.

The PIM tester is a $40,000 piece of equipment which works by feeding two RF carriers into the antenna and measuring the level of the intermodulation noise reflected back to the unit.

The level of noise generated was considered excessive and we found by shaking the tower and feeder cable that the noise level increased significantly.

This is an indication that there is a faulty joint somewhere in the connectors or the antenna itself.

The receiver desensitisation test was inconclusive as we were unable to measure the receiver sensitivity reliably as the repeater doesn't seem to have an internal speaker. It does appear that the repeater mute may be set too low, hence, why the receive light seems to come on randomly.

I'll write up an article for the magazine on what we did in the near future.

A club working bee (and BBQ, of course) will be a good opportunity to clean all this up once the weather improves.

See you at the GM on Friday 16th of August

73

Tony Doyle (VK3QX)
GGREC President
president@ggrec.org.au
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From The Editor

What a wild week we have had! The picture above is the remains of the end of the Frankston pier, all the upper deck was smashed off by the waves, and has started to slowly drift up towards Seaford. My Nally radio tower is still 'broken' and not fully extended, probably a good idea when the weather bureau was forecasting 160K winds.

I think it stopped at about 100 K's in Frankston, thankfully. Whilst the jetty copped it, the local trees seem to have fared a lot better, and there was no twisted aluminium in my backyard.

The last few weeks have been rather hectic, what with the hamfest, this magazine, and trying to keep the projects flowing as the time flies, so sorry, no repair article this month.

Of course as the magazine looms, the bugs in my Arduino code started to bite, maybe I should go back to good old assembly language, that way I'd be spared the vagary's of the 'C' language and that of its various library's. For example, blanking leading zero's on the LED display, an obvious thing to do, but not in the eyes of the LED display library writer.

The hamfest is over for another year, I took quite a few pictures, they are currently up on the club website at. http://www.ggrec.org.au/gallery/albums/hamfest-2019/

Or how about a hamfest video (not mine) https://youtu.be/y6Rlyc7D2Tc

I think Toni, selling Graeme's equipment, had the most loaded table by far.

It does not look that bad in this picture, however early on the bow in the table centre was quite pronounced, they should probably have had two tables, as there was heaps more on the floor.

It all proved quite successful, sales wise, as the list of items for sale got a real bashing.

Hopefully I'll be back up to Graeme's to add a few more items, so stay tuned.

Paul VK3TGX

August Contest Report

This weekend, 17 August 2019, is the Remembrance Day (RD) contest and while it is an enjoyable contest we must take a moment to reflect on the loss of life suffered by those radio operators.

Operators are invited to work as many VK, ZL and P29 prefixes as they can during the contest period.
All bands are open except for WARC bands and HF SSB operation is limited to the following frequency ranges: 1843-1875, 3535-3570 and 3600-3700, 7080-7300, 14112-14300, 21150-21450, 28300-29100KHz.

Please see: http://www.wia.org.au/members/contests/rdcontest/

Given the VK, ZL and P29 operator pool is quite small, one enjoyable aspect of this contest is that you can rework a contact after three hours.
Then as the night progresses it builds a kind of fraternity especially with operators who may be camping out and working the night.

Tips:
1. Get onto 160m if you are an advanced call.
2. Work the night, 0100 to 0600 local time.

This year the shack of VK3TIN will sojourn at the grassy planes of South East Gippsland where it will be raining and windy and I will be operating from a tent in the middle of a paddock with no shelter. However none of this will matter because I will be living in a word of sound, an aural landscape of bands and voices rich with texture and the occasional OTHR QRM. Unless I slip a peg or something then it will get interesting.

This years RD Day portable shack will consist of:

1. Separate receive loop antenna system based on LZ1AQ's wide-band receive amplifier: See http://active-antenna.eu
2. Icom 7300, with external RX socket modification and home built RX protection.
3. Separate transmitting antenna based on the classic random wire antenna but with integrated common mode choke and a field of radials. This is then connected directly to an LDG RT-600 remote antenna tuner. The radiating element will be held aloft in an inverted L using an 18m Spiderbeam fiberglass mast and will slope downwards over ~40m to a 12m Spiderbeam fiberglass mast.

The receive loop is directional and will be mounted on a 3m pole and pointed using a SPID RAU rotator from RF Hamdesign in the Netherlands.
See https://www.rfhamdesign.com/index.php

It will be interesting to see how it goes, I will post a full report next month.

This weekend, 17 August 2019, is also International Lighthouse and Lightship Weekend, there was some agitation in VK because this clashes with the RD contest but I think having the two on the same weekend is very good because it means there will be more stations on air so be prepared to run two logs one for ILLW and one for the RD Day contest.

Scores:

The Trans-Tasman contest results were released on the 4th of August 2019.

Single Op, high power: VK5SFA, VK2PX, VK2QV, VK7BO
Single Op, low power: VK2MT, VK5LJ, VK3LM, VK3GL
Single Op, QRP: VK2MG, VK2IG, VK4FOMP, VK3YE
Multi Op, single tx: VK2GGC, VK2NU, VK2MB, VK5GR
Multi Op, multi tx: VK3KJ, VK4QH, VK2AWX, VK4WIS

Full results: http://www.wia.org.au/members/contests/transtasman/
Good to see an F-Call in the top three of the QRP category!

Ted Powell Memorial Dx Challenge.

The results for the Apr-June period of the Ted Powell Memorial DX Challenge are out with Wes VK6WX in first, David VK3BDX in second, Marc VK3OHM in third and Brendan VK3MH in fourth. The Ted Powell Memorial DX Challenge was developed by the Fishers Ghost ARC and was created to memorialize Ted's passion for working rare DX. The scoring is interesting and is computed such that a contester with a few higher ranked entries will out score a contester with a lot of lower ranked entries. For more details see: http://vk2au.org

DXCC VK Leader board on Sun 11th August 2019,

VK3BDX, David Burden (203)
VK3KJ, Scott Williams (167)
VK3SIM, Simon Keane (162)
VK3MH, Brendan Bryant (160)

See: http://www.wiaawards.com/view/DXLeaderboard.php

Finally, I want your contest reports to publish here otherwise I have to pad this out with YouTube videos or talk about what I am doing all the time. Readers really want to hear what is going on and what you are doing, even a few sentences would be excellent. I will even send you a picture of Queen Victoria if that would help.

Contests to start panicking over.

Remembrance Day Contest (17/18 Aug).
See: http://www.wia.org.au/members/contests/rdcontest/

Contests to start planning for:

OCDX contest, first and second full weekends in October for phone and CW respectively.
See: http://www.oceaniadxcontest.com/index.html

Spring VHF-UHF field day (23/24 Nov)

From YouTube:
https://www.youtube.com/watch?v=-JI8mjJMXOc
https://www.youtube.com/watch?v=9U0i7GvGJLI
https://www.youtube.com/watch?v=a89TOFTXHog

See you next month!
Megan Woods
VK3AAK, VK3TIN and AJ6EI

Recycle It

'Yesterday' power savers seemed all the rage, if it wasn't 'free' LED globe upgrades, then it was power savers. Gees it only seem like yesterday that they came a-nocking pushing CFL lamps, as in 'Compact Fluorescent Lamps'. Now they are also evil, time for "Super cheap LED's" – *eek!*
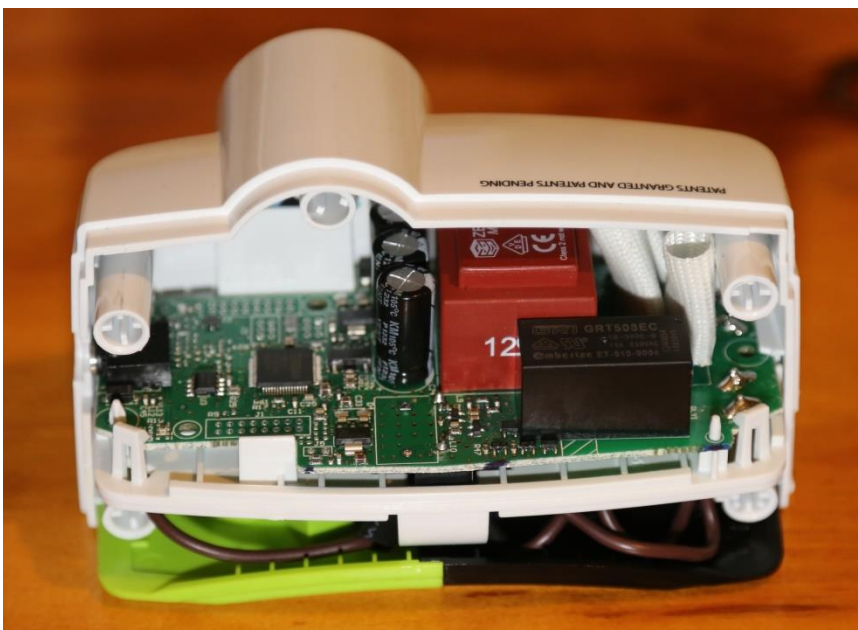
In this article I am looking at making use of unwanted power savers. They all kind of start off with good intentions, but the side effects of how they do their power savings can easily get you off side and wanting to bin the lot. For example, units intended for the TV frequently look for remote control signals, if none are seen for say a hour or two, they figure you've gone asleep etc. They then flash a little warning light a few time as a warning then turn everything off, right in the middle of an epic movie that has you hooked, hence not seeing the little light.

The main wash-up from all this is a pile of often well intentioned and more often than not extremely cheap electronics, that misses the mark they are supposed to hit (saving electricity) and end up just becoming more land fill. For an example of the 'bottom end' read the article in

last month club magazine where I pulled apart one of those power boards, it's actually the one on the lower right, in the picture above.

As you can see I have acquired 6 of these devices, including one Embertec brand new in box.

Of interest to me this time is one of the Embertec units, the labelling says these are designed in Australia but made in China.

Their build quality appears far higher than the power board I pulled apart in the July magazine. This article is about the second Embertec unit I have set about repurposing.

The July magazine power board was a live chassis affair, somewhat limiting what could be done. As mentioned there, usually the only option is to ditch the circuit board and fit something else, usually (in my case) a 12V relay. The trouble here is that to turn on the power you need an existing source of 12V to energise the relay. I have used a few boards of this type in the past to drive Christmas lights, in which case a central control 'rig' has done the 12V supply duty. In another setup, actually to switch power to my study computers, where I am typing this, I have a very well backed up 12V source, (100AH battery) so again it worked out.

However in the case of these Embertec units there is a small power transformer that powers the on-board micro via a 5V linear regulator, all very nice and convenient, no live chassis here.

I modified one of these ages ago for my aunt, the power point for her computer desk was way too hard for her to access. (she, like me, prefers thing off, not in perpetual 'almost off'.)
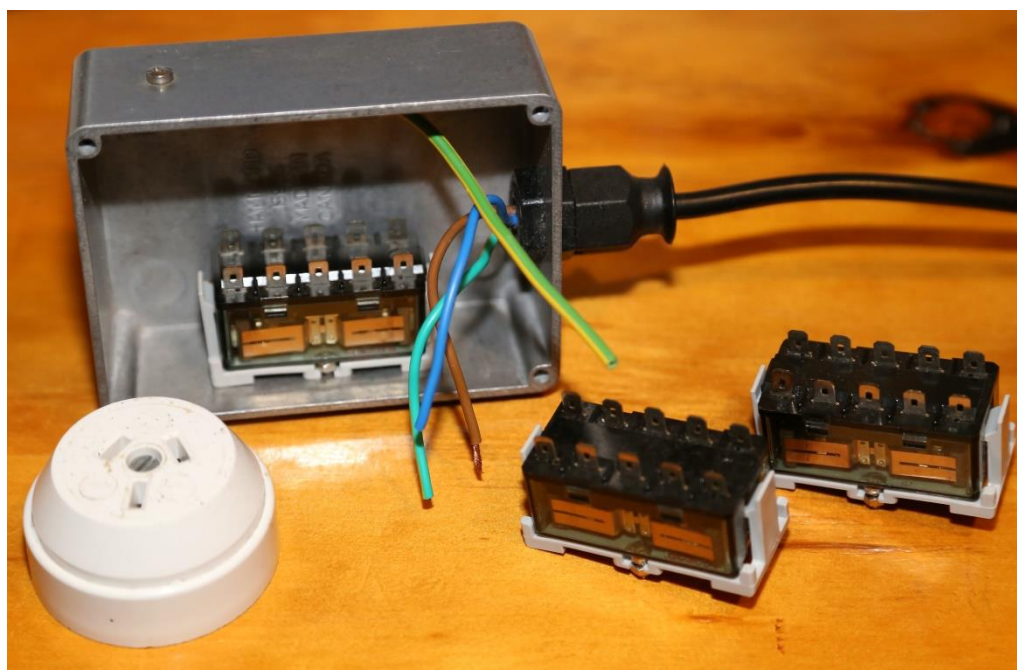
In these units, apart from the power supply, is a latching relay, a microprocessor, and a current transformer. I did look up info on the included 'Teridan' micro and figured it not worth the time to learn how to write software for, and then reprogram it, so I literally cut it out of the board.

Some micros, like those from Microchip are incredibly easy to get going with, the suppliers all but falling over themselves to help you. Then there are the others, that unless you are a multinational wanting to build on a large scale, they just won't talk to you, so ditch the chip.

In my aunt's case, I replaced the latching relay, and put a switch on a lead that simply connected the new 'conventional' relay to the power supply. These Embertec units come in two flavours, 'AV', or 'Computer'. The 'AV' version includes a detachable lead with a small box on the end containing a push button that the micro see's, that's where I put the toggle switch.

This time I am going to retain the latching relay and provide two push buttons, one for 'on', the other for 'off'. Normally latching relays have two coils, if you pulse one the relay will toggle 'this' way, and stay there (even with no power etc.) until the other coil is pulsed.

Latching relays are actually far more efficient than normal relays, as they only need power to toggle, once toggled they stay that way almost no matter what.

Here is an alternative to using the Embertec that I am considering, along with two more 15A latching relays.

I'm sure I can find a small 12V transformer to complete the job.

Paul VK3TGX

For Sale

Philips PRM 8010 transceivers UO band.

Hi everyone, I've stumbled across a large quantity of PRM8010 radios. The majority of them have mounting brackets and power/speaker plugs (cut fairly short). They have no microphones. Cost is $10 each

The PRM 8010 is a 440 MHz to 470 MHz 10 channel radio and with a bit of tweaking can be reprogrammed to 430 to 440 MHz. The majority have the 15 pin connector on the back for audio input/output etc. I believe they also have built in CTCSS as well.

If anyone is interested email me, secretary@ggrec.org.au and I'll put you in touch with the seller, pick up is at Langwarren South. The gentleman selling the radios is also happy to post them at a cost,

Cheers and 73,

Rob VK3BRS

And Finally a Radio Application

Sick of the small displays on modern radio's, well then how about using Nixie tubes? I won't say this solution is without problems, there is probably some digital hash from the Arduino as it is constantly clocking in new values to the display counters, etc. (I never tested it for that, oops)

This does of course lead to a few other radio related projects, apart from external displays, extra function buttons & maybe a keypad for direct frequency entry? (Yes, Yaesu has a keypad mic, but I don't have one, only its lowly DTMF brother)
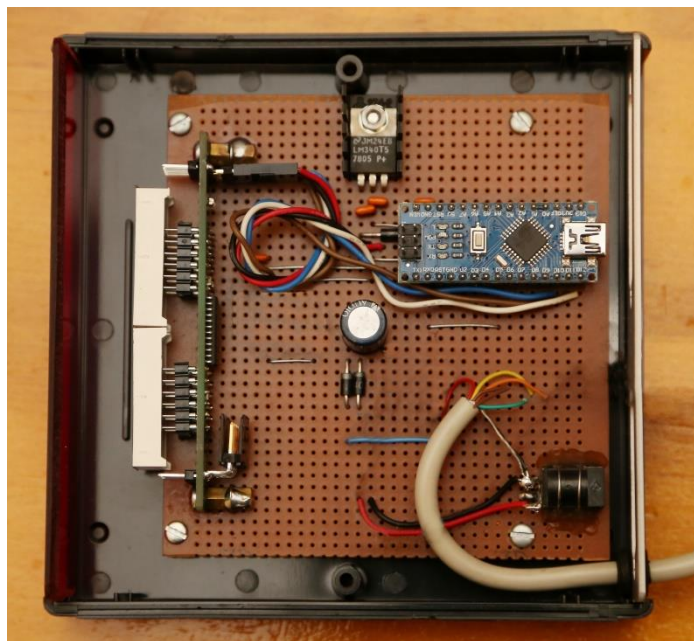
Most newer radios have a serial port on their back panel, Yaesu calls it a 'CAT' port, or 'Computer Aided Transceiver'. On the FT-897 it is a mini Din connector using 5V logic level signalling, perfect for direct connection to a micro/Arduino. This is not always the case, the club's FT-950 uses a 9 pin 'D' connector, the same as on a PC, and the signalling is in RS232 format, plus and minus 12V. Yes there are plenty of bodges out there that allow an almost direct connection between the radio and an Arduino. However I'd advise you to pick up a proper level converter from a shop/online, they are only a few dollars and guarantee success.

On the Arduino Nano you have one serial port, perfect, however that port is what you talk to it with when programming & debugging, so I went for an alternative and used a software serial driver to give me an extra port, however when all the bugs are out, swinging the radio over to the hardware serial port should be no problem, and is probably the better way to go. The only catch is you will have to pull the CAT cable out of the radio to enable programming.

On the other hand, if you would like an external display without all the bother of sourcing obsolete (Boy do I hate that word) components, or having to deal with high voltage supplies then this may be more your style, built with off the shelf parts, and in this case also powered by the radio, no extra power lead needed. This photo does not do the display justice, as it is quite bright and the contrast leaves the LCD for dead. You will notice the digits appear almost white, that is because they are overwhelming the camera's image sensor, even against my flash gun.

One limitation of the Nixie tube version, is it only has 6 digits, meaning the software has to shuffle the display over on VHF/UHF, loosing the last two digits.

So where is this all going, for the most part there is not much gained with these external displays, assuming the internal radio's display is ok with you. However there are other radio's that don't have frequency displays, so an add on unit could be very handy. (…page 9)

So do you have any ideas for radio add-ons?

Here is an edited view of the LED display box's internals. I edited out two sections that are not used in this build. It started out as an experimental frequency counter, and ended up on the junk heap as I was not happy with it.

As you can see there are only 3 parts, the Arduino Nano, a LED display module and a 5V power supply.

File Edit Sketch Tools Help

```
LED_FT897_Frequency_Display

65
66
67  void loop() {
68    delay(100);
69    if (RadioSerial.available()==5){
70      RxChar[1] = RadioSerial.read();
71      RxChar[2] = RadioSerial.read();
72      RxChar[3] = RadioSerial.read();
73      RxChar[4] = RadioSerial.read();
74      RxChar[5] = RadioSerial.read();   // mode
75      Digit[1]=RxChar[1]>>4;
76      Digit[2]=RxChar[1]&0x0F;
77      Digit[3]=RxChar[2]>>4;
78      Digit[4]=RxChar[2]&0x0F;
79      Digit[5]=RxChar[3]>>4;
80      Digit[6]=RxChar[3]&0x0F;
81      Digit[7]=RxChar[4]>>4;
82      Digit[8]=RxChar[4]&0x0F;
83      //Send digits to debug console
84      Serial.print(Digit[1]);
85      Serial.print(Digit[2]);
86      Serial.print(Digit[3]);
87      Serial.print(".");
88      Serial.print(Digit[4]);
89      Serial.print(Digit[5]);
90      Serial.print(Digit[6]);
91      Serial.print(".");
92      Serial.print(Digit[7]);
93      Serial.println(Digit[8]);
94      // Now send the digits to the display module
95      lcl.setDigit(0,7,Digit[1],false);
96      lcl.setDigit(0,6,Digit[2],false);
97      lcl.setDigit(0,5,Digit[3],true); // with decimal point
98      lcl.setDigit(0,4,Digit[4],false);
99      lcl.setDigit(0,3,Digit[5],false);
100     lcl.setDigit(0,2,Digit[6],true); // with decimal point
101     lcl.setDigit(0,1,Digit[7],false);
102     lcl.setDigit(0,0,Digit[8],false);
103   }
104
105   while (RadioSerial.available()) {
106     RxChar[1] = RadioSerial.read();      // flush the Rx bu
107   }
108   RadioSerial.write(0x01);
109   RadioSerial.write(0x01);
110   RadioSerial.write(0x01);
111   RadioSerial.write(0x01);
112   RadioSerial.write(0x03);               // Read RX Status
113 }
```

Here is the main part of the code. Normally I cannot easily publish much of it in this mag, however as this one is quite small here we go.

The first part, lines 69-102 is reading in the frequency from the radio, the FT-897's response is in 5 bytes, hence line 69 only accepting 5 byte responses.

Line 70-74 is reading those 5 bytes into an array 'RxChar[x]'

The first 4 bytes are the frequency, presented as 2 BCD characters per byte.

Line 75-82 is splitting the 4 double BCD character into 8 separate bytes, 'Digit[x]'

Optional lines 84-93 are then sending the frequency back to the USB port for a PC to see.

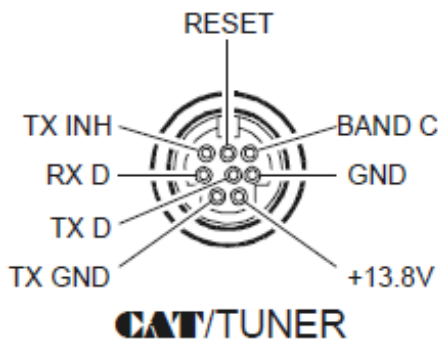Lines 95-102 are sending the frequency to the LED display.

Lines 105-106 is to make sure the serial receive buffer is empty, a bit of insurance.

Lines 108-112 are sending the command to the radio for it to send its frequency back.

Now you may be thinking I've got it back to front, expecting the a response from the radio before making a request, and on the first loop through this code, line 69 will fail, however we are only talking a tenth of a second, so nothing is lost.

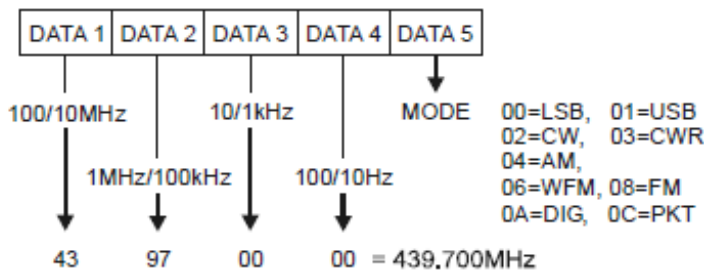I wanted to minimise the delay between processing the last response and making the next. In hindsight I should probably move lines 105-112 up to line 75, as at that point the last requested frequency is now safely stored in the Arduino, the processing of that data can then proceed whilst the radio is also processing the request for another frequency reading to be sent.

CAT/TUNER

Here is the pinouts for the Yaesu FT-897's CAT socket, we are only interested in 4 of the lines, the others are for when this socket is used to drive the optional antenna tuner.

TX D, & RX D, are both TTL, or 5V, so no conversion is necessary. I also used the 13.8V pin to run my display. Normally there is a spec in the manual as to the maximum current available here, I could find none, however as it can power an auto tuner, I figured a few LED's should be fine.

Here is the response packet for "Read Frequency & Mode....".
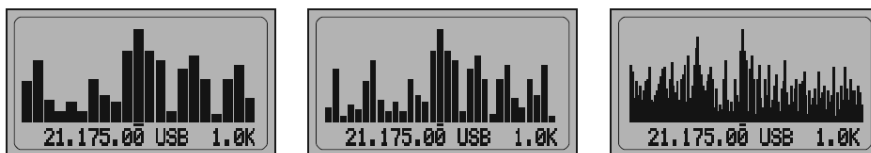
The first 4 bytes are the frequency.

The numbers are in 4 bit BCD format, hence being able to pack two digits into each 8 bit byte.

If you try and talk to the radio with a terminal, you will only get what appears to be gibberish as the response is in packed BCD, not ASCII as a terminal expects to see. That is why I also have my code sending the frequency back through the USB port as plain ASCII text, that way most things should be able to offer human readable text.

At present it only sends the frequency, not the 'Mode' data, that is simply discarded. maybe it could be useful if I extract all the info I can from the radio and send it all out as plain ASCII.

I have had thoughts of hacking into the radio so I can read all the info from its display, there is a lot of info, like spectrum scope displays etc. that are all but totally inaccessible, CAT port wise.

So what is next?

I thought I had the perfect case, size wise, for that other display module from Graeme, however I was short by 2mm, nothing a liberal application of hot-melt glue could not overcome.

The colour combination is a bit much...

Paul VK3TGX

Hamfest 2019

http://www.ggrec.org.au/gallery/albums/hamfest-2019/

Club Information

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

Office bearers

President	Tony Doyle	VK3QX	Web Master	Megan Woods	VK3TIN
Admin Sec	Rob Streater	VK3BRS	Magazine Editor	Paul Stubbs	VK3TGX
Treasurer	Megan Woods	VK3TIN	Property Officer	'committee'	
General 1	Helmut Inhoven	VK3DHI	Assoc. Secretary	Rob Streater	VK3BRS
General 2	Leigh Findlay	VK3FACB			

Call in Frequencies, Beacons and Repeaters

The Club Station VK3BJA operates from the Cranbourne Clubrooms.
6m Repeater Cranbourne VK3RDD, In 52.575 Out 53.575 CTCSS none
70cm Repeater Cranbourne VK3RGW, In 434.475MHz Out 439.475MHz CTCSS 91.5Hz
VK3RGW Repeater supports Remote Internet access (IRLP), Node 6794.
70cm Repeater Seaview VK3RWD, In 433.575MHz Out 438.575MHz CTCSS 91.5Hz
Simplex VHF - 145.450MHz FM, Simplex UHF - 438.850MHz FM
VK3RLP Beacons 1296.532MHz & 2403.532MHz (currently inactive)

Membership Fee Schedule

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

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