



GATEWAY

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

September 2016



Arduino – Big Clock

10 MHz Reference Woes

Camping Trip – Anyone?

And More

**President's report
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Event Queue

September:

- 16th September General Meeting & portable antenna talk by Len VK3FB
- 18th Club Net 8.00 pm - on VK3RLP
- 20th Arduino night, Tuesday 7:30 ***** NOW ON TUESDAY ***
- 23rd-25th D-STAR (Digital Amateur Radio) QSO party
- 25th Club Net 8.00 pm - on VK3RLP

October:

- 2nd Club Net 8.00 pm - on VK3RLP
- 4th Arduino night, Tuesday 7:30
- 7th Prac night
- 9th Club Net 8.00 pm - on VK3RLP
- 14th, 16th 59th Jamboree on the Air (Jota)
- 16th Club Net 8.00 pm - on VK3RLP
- 18th Arduino night, Tuesday 7:30
- 21st October General Meeting
- 23rd Club Net 8.00 pm - on VK3RLP
- 30th Club Net 8.00 pm - on VK3RLP

November:

- 1st Arduino night, Tuesday 7:30
- 26th Rosebud RadioFest 9:30 am till 2pm

PRESIDENTS REPORT – SEPT 2016

By Ian Jackson, VK3BUF

I have decided to use some of this space to comment upon recent developments within the Wireless Institute of Australia. The GGREC has been a W.I.A. affiliated club for almost 40 years now. It remains committed to see the Institute represent the interests of all Amateurs to both the Federal Government (via the ACMA) and the Australian public.

The WIA operates as a Public Company run by a board of seven directors and its behaviour is subject to the Corporations Act. A range of mixed and disturbing signals have been coming from this board recently.

Several Treasurers and other office staff have left their position in the past year. Phil Wait, the President has released bulletins saying that there has been no Treasurer and no detailed financial reporting since mid-year. He indicates that although the Institute presently seems to be operating at a loss, that generally, everything else is fine.

Other reports from the board conflict with this view and say the WIA is loosing at least \$1000 per week and essential work is not being done. One quote from a dissenting Director was *“the Board in my opinion has no Policies or procedures, no corporate governance and was fiscally incompetent.”*

Last month two of the seven Directors moved a motion that the remaining five, including the President, were in breach of several sections of the Corporations Act and should resign. This motion was defeated by the five Directors concerned.

As an affiliated Club, it is not unreasonable for us to be taking an interest in these proceedings, but to date the GGREC committee has taken no official position until it receives guidance and consensus from Club members. We have circulated some of the statements by the President and opposing Directors. We have also invited our members to pass comment by email to the GGREC Committee on their opinions regarding WIA management.

The results have been interesting to say the least. So far we have had around ten items of correspondence on the subject. A few have said they have not renewed their WIA membership and won't while the present management is in charge. Some want to see forensic audits taking place immediately. The unanimous feedback to date says that the present board should resign and fresh elections held before the standing of the institute further degrades.

So far there has been no feedback received from GGREC members to support the five directors that presently control the WIA management.

Please, if you have not done so yet, let the Committee know via email what your thoughts are on this topic, even if you believe them to be doing an excellent job. As an affiliated club, we should have a position in this debate and we require reasonable consensus from our members before we can say that we represent them.

If you want to examine information from the WIA management on where they believe the organisation is positioned, have a look at: <http://www.wia.org.au/joinwia/wia/presidentsblog/>

If you want to examine information from persons taking issue with this position, some recent posts can be examined at the W.I.A. Reform group site: <http://wiarg.org/>

We will endeavour to keep you posted on developments about the W.I.A.

Now on to more local news.

I'd like to congratulate Robbie Xin on his new callsign of VK3FAMT. I look forward to catching up on-the-air with Robbie soon. Well done!

Last month we had a spontaneous session on Radioteletype and a play with an old Siemens 100 telegraphy machine. It generated a bit of interest. Since then I dug out an old file of RTTY notes and found some printouts produced on the same machine 35 years ago selling components to GGRC members, before it was GGREC. In those days I used it as a printer for an early Dick Smith System 80 computer. There were also several teletype contact sheets between Club members back in 1981. There was quite a lot of action on this mode back then. I'm pleased that the machine works as well today as it did with those early experiments.

I have made up an adapter cable between the Siemens modem and the Clubs FT950 so that it can send/receive true FSK on HF. Last prac night we tried it out briefly. While it seems to be working fine, there was not a lot of RTTY action around at the time. The machine has been left in the Club shack for the time being so we can try again later.

Our Arduino night roughly every second Monday continues to attract a lot of attention. Pretty much everyone in the interest group has a working module now and Albert is walking us through the basics of program structure. Over the next month or so we should begin to see these units performing tasks under software control. It is very remarkable technology.

You will see an advert in this magazine for our intended camping trip at the beginning of November. It should be an epic trip, so check it out if you can.

This Friday night we have Len VK3FB coming along to talk about his portable antennas, so make some room in your diary to see how these come together.

One task we need to resolve before the end of the year is to find a members home for the Christmas Breakup barbeque lunch to be held in early December. Traditionally, there are no meetings in December, but we do enjoy our barbeque. If you would like to contemplate having this event at your place, please contact a committee member. Be assured that we take what is needed and clean up as we leave. Regrettably I shall be out-of-town at that time, so I get to miss out on the fun.

We'll see you then. Cheers, Ian VK3BUF

Notice Board

GGREC Sunday night Net

Want to know the latest GGREC Club news and details of upcoming events?

If you want to be kept up to date then you need to call into the **GGREC Sunday Night NET**.

The NET is held every **Sunday** at **8:00 PM** sharp on **VK3RLP 439.475 MHz, 91.5Hz** tone access.

Don't miss out!

Change of Arduino Venue and Day

After receiving an absolute majority of acceptance emails to change the Arduino session nights from Monday to Tuesday, we have made temporary arrangements to use the Guide hall for future sessions.

THAT'S NEXT TUESDAY, 20TH SEPTEMBER IN THE GUIDE HALL READY FOR AN 8PM START.

Bring your laptop, UNO board and your kit of parts. If you did not order your kit of parts, bring along a couple of LEDs and maybe one or 2 tactile switches.

Regards

Albert VK3BQO

Event Queue, Notice Board & Magazine Articles

Do you know of any event that would interest club members?

Send it in, and it'll be listed – alternatively, Write it up and submit it as an article.

The magazine is in need of articles, it is currently almost a 3 man race.

Corrections to the Magazine

If you find any general errors in the magazine, contact the editor, Paul VK3TGX

If however, you find errors in the **General Meeting Minutes**, contact the **club Secretary**.

Contact details are on the last page, or refer to the club membership list.

From The Editor

So here I am, 3 weeks into the GGREC Arduino group “course”, they don’t like calling it that, but for the time being there are quite a few similarities, probably the biggest difference is that courses end, whereas an interest group will hopefully continue on. A while back Ian ran an AVR micro course, when it ended few members continued, I unfortunately was one of the dropouts, probably due to work commitments etc. Now that I am between jobs, and also trying to come up with content for the magazine, hopefully I will stick at it for a tad longer.

On the first night, the introduction, I took along my camera for a few shots, then someone suggested I video it, so I did. I have seen quite a few video’s on youtube from various universities on several subjects, ranging from an introduction to programming, to general relativity etc, produced by top universities (as an aside, they are interesting as a glimpse into university life) So why not record the Arduino material, both for those who missed out, and for reviewing what was said. Several years ago, I did an audio recording of an antenna construction talk given at the club by John VK3YTV, and I have been wanting to try it again. Unfortunately when I sent the video in for comments, and possible dissemination, it received a rather cold reception, oh well, back to still photography for me. – You can’t win ‘em all.

Anyway, Rob sent in an article about his 10MHz shack reference giving trouble, it reminded me of a HP105B Quartz Crystal reference oscillator I pick up when I worked for Telstra.



I worked in their repair shop for quite a while. They had a certified calibration lab, which included a pretty good 10MHz frequency reference (it was tied back to a Caesium atomic clock at the research labs), so at the time I was rather keen to set up my own reference.

This unit (HP105B) was used as a secondary reference (alongside a GPS locked Rubidium reference) as a way of checking the quality of the signal from the research labs.

Normally one would be over the moon to have a GPS locked Rubidium etc., but NATA? would not accept it for calibration purposes because the source (GPS) was controlled by an overseas organization, which of course they could not personally validate.

I had kind of forgotten all about it, well with my latest foray into clocks – and trying to calibrate their less than ideal oscillators, it is probably time for me to clean it up and lock it to GPS.

Paul VK3TGX

CAMPING TRIP ON THE AVON RIVER

We have a weekend coming up in October/November that may for some be turned into a 4-day weekend. Melbourne Cup day this year falls on November 1, so the plan is to head for a campsite on the Avon river a little northeast of Lake Glenmaggie on Saturday October 29.

We conducted a survey of interested campers and settled on this **Huggets Crossing** site as for most it will be under 3 hours of travel time to get there. If anyone interested in going chooses to get there the day before, it will enhance our chances of staking out a good camping area.

The last kilometre is a little more rough than a level track, so to reach this spot you will probably need a car with a little more ground clearance than the average town car. All-Wheel Drives and high clearance 2 wheel drive cars should be ok. If you have a 4wd than towing a trailer or small camper should be no problem.

It is a fairly large camping area, close to the river. There should be ample room for our group, even though there will probably be others in that area for the long weekend.



There is a basic toilet facility at the site. A number of pit fireplaces and a few permanent picnic tables too. You would find lots of space for antennas up if you want to play with some HF.



In the area we can see the Avon river pass through a narrow gorge called "The Channels" which is worthwhile checking out if you had not seen it before.

If you do run out of essentials while at the camp, the town of Heyfield is only about 30 minutes away. Apart from that you will need to be self-sufficient.

It is a beautiful spot, I hope many Club members can make it.

Next month we will print an access map with more detail of how to get there.

Exploring the start of The Channels area.

Arduino Interest Group

A bit squeezey,

However a good
night was had by
all.



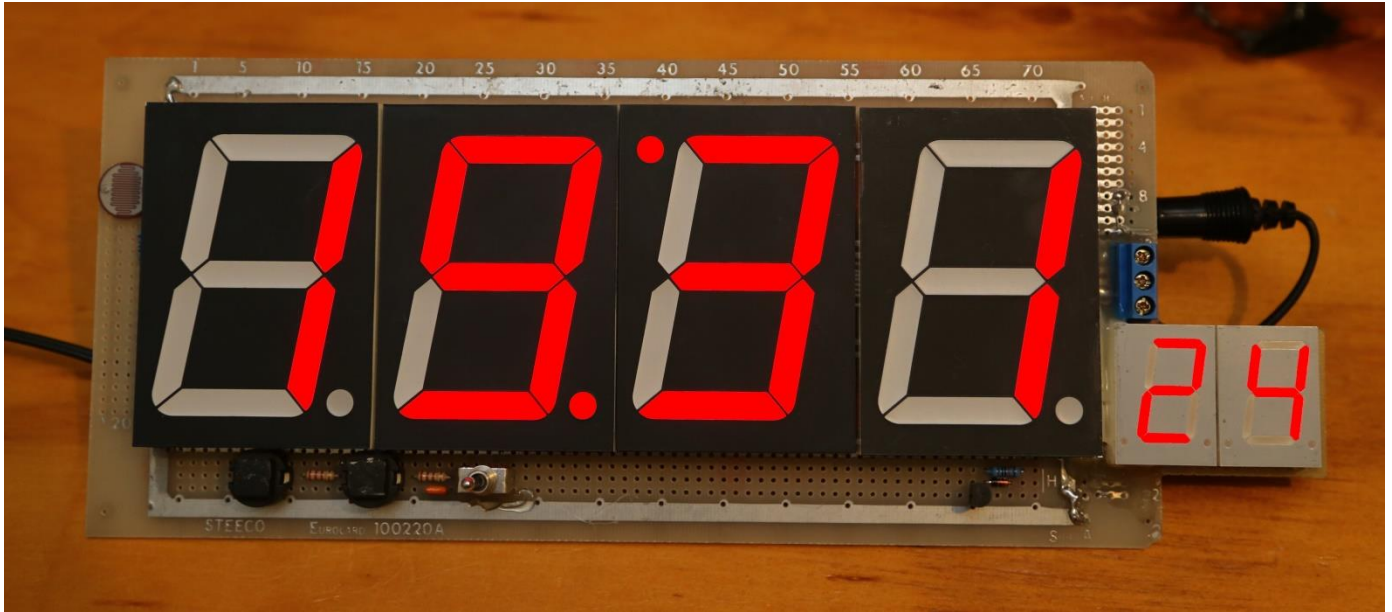
There is talk afoot about
holding the meeting in
the Guide hall on
Tuesday nights.

To give us some more room

We certainly didn't
need any heating.



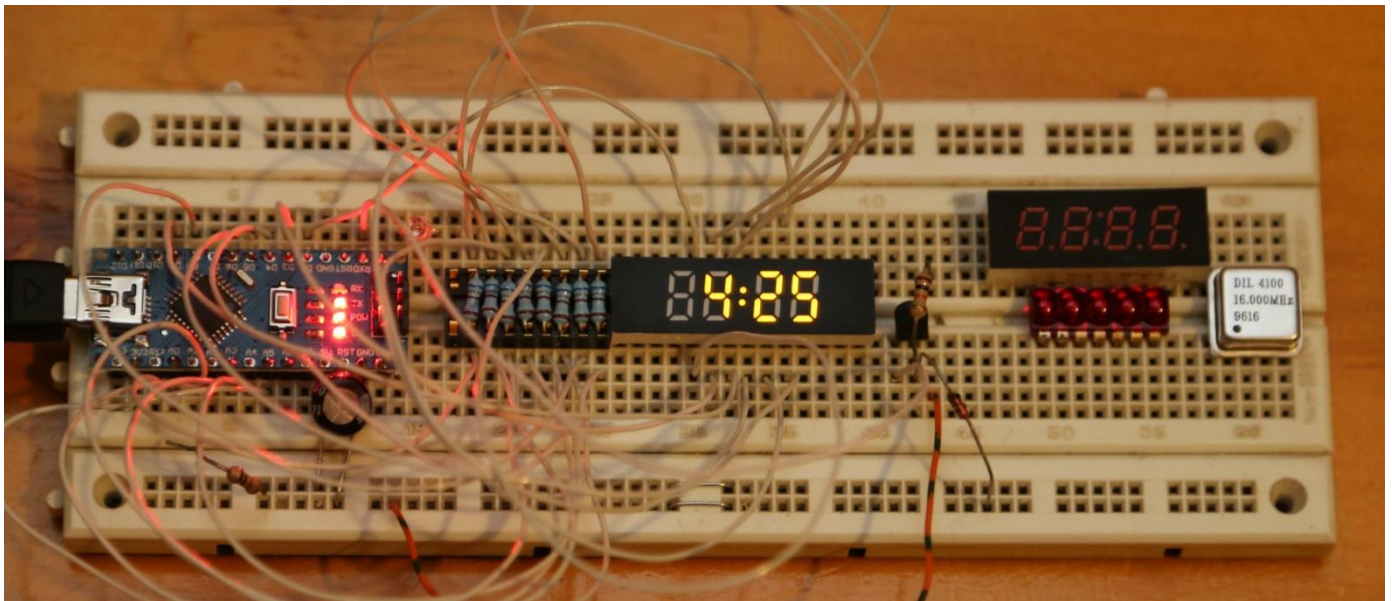
Big Clock – an Arduino project



This is my 'third' go at making a clock. My first efforts was with the 6800 series micros many years ago, later I revisited the subject using a Zilog Z8 chip – of which I have some surplus board on offer to club members.

This time around it was all started by the GGREC Arduino group

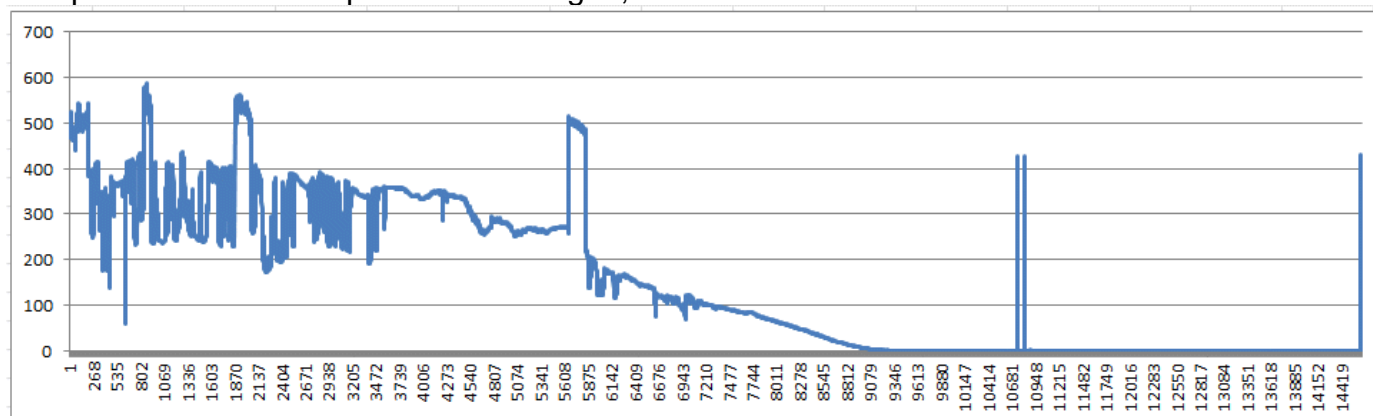
In the last magazine, was the beginnings of my 'Big Clock', Now before anyone complains that it is not that big, (compared to Ian's clock etc) I am more referring to a design targeting large LED displays, than trying to make a monster. In my book, small is where the display can be run



directly from the 5V logic/processor supply, with minimal (if any) driving devices, like on this proto board whereas large displays usually require a higher supply voltage and more current than can be supplied by the micro's I/O ports on their own.

There are two basic techniques, either multiplex the display, or use additional IC's etc to directly drive each LED. Now from the radio and interference viewpoint, direct constant DC drive should produce less hash. However I have chosen the multiplexed path. In the end it kind of worked out to my advantage. When I got it up and running, the good lady said "where are the seconds". In my study, I have a video monitor that spends 99% of it's time being a clock - it has seconds on it. As this new clock was targeted at the kitchen, seconds seemed overkill. She has probably become accustomed to seeing the seconds, She won, it now has seconds.

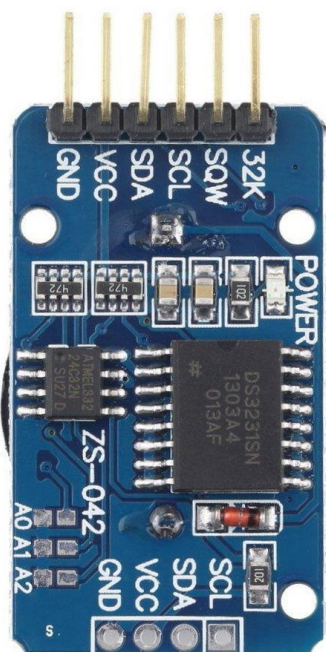
I didn't have any more of the huge seven segment displays, so I used some smaller ones for the seconds. Otherwise it was extremely easy to add them, all I needed was two more digit drive outputs, no probs, I had 2 spare ULN2003 outputs available, and the software was all but there for seconds. If I was going the direct drive route, I'd need two more driver IC's and 14 resistors, and hopefully have enough spare processor I/O lines. The multiplexed drive also made display dimming relatively easy to implement. With a multiplexed display, the drive power is shared between the displays, as the number of digits it increased, the effective power to each digit decreases. So as a 'quick hack' I simply lied to the multiplex routine and reconfigured it to 20 digits. Each digit receives either 1/6th drive for full brightness, or 1/20th drive for low brightness. The ambient light level is measured by a cds light sensitive resistor, coupled to one of the AVR's analogue inputs. I was originally going to implement variable brightness, so the displays tracked the ambient light level, but in the end, the task of mapping light level measurements to display drive levels seemed not worth the effort, especially after obtaining a plot of light level measurements made by the clock, on test in my study. – This was from afternoon, to night-time, not quite the smooth slope I was thinking of,



The 3 blips are where I probably turned on the study light.

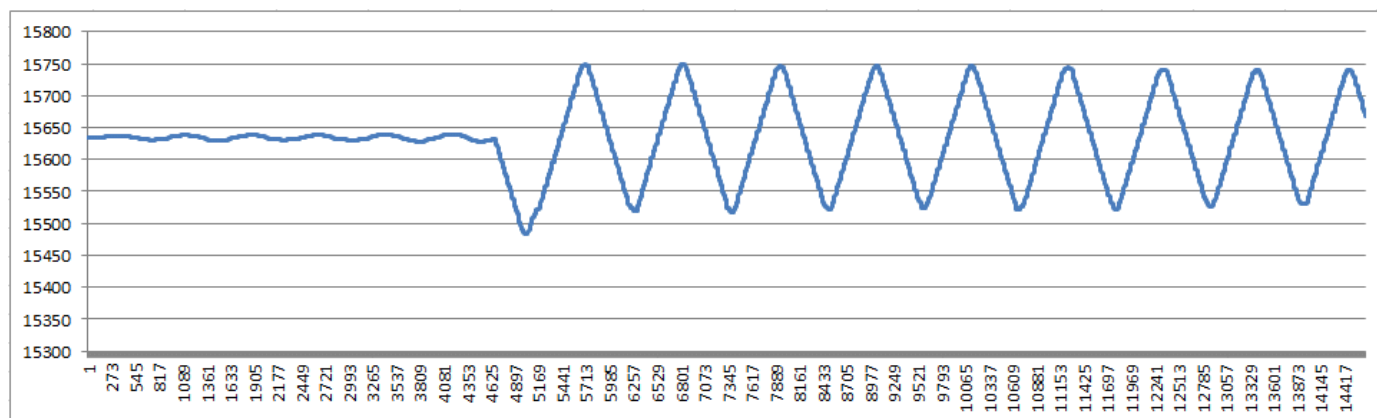
A more important task was how to keep the clock accurate. There are two good choices and lesser so options. The lesser options is to rely on a quartz crystal, either the one running the clock, or an additional source, such as one of the many battery powered modules available. However, to obtain good accuracy, you need to be able to adjust the crystal, the miniature device on my Arduino Nano has no provisions, nor space for a trimmer, and I doubt any of the modules available have any either. To make matters worse, I discovered early in the piece that the 'device' on my Nano is probably a ceramic resonator, as I found it to be about 180KHz high!. I am told by Ian that he has had good success with the clock devices he has used, however I have seen many that leave a lot to be desired (try checking the clock on a computer not connected to the net, I bet it's miles off). This unit I found on eBay for \$3.78 offers temperature compensation, as well as a register to allow for ageing. Great, but I bet it would be 'fun' to calibrate. According to the web it is rated at $\pm 2\text{ppm}$ from 0°C to $+40^{\circ}\text{C}$. As it offers time & date etc, you could build a clock that just kept reading one of these and sends the results to a display. Buy one and tell us how you go. The better option is to either sync your clock to

GPS time, or rely on the mains power frequency. The cheapest has to be the mains. Short term it is horrible, but long term it is truly excellent. If you are worried about power fails, then also fit a battery backed clock module. Keep writing the current (mains derived) time to the module, only reading it when power is restored. With a power



break of an hour or so, the module's drift won't be noticeable. The other option is GPS, the modules are not that expensive, this one was listed at \$26, intended for a flight controller, but it looks ok. Its antenna is located on its back so remember they do need to be able to 'see' the satellites, so that may impact on where you can install the clock. There are also modules that come with external antennas; however they tended to be much more expensive. Decoding the data stream to extract the time is fairly complex, however Google should be able to help here. (a cruder method would be to use the 1pps output and ignore the GPS data stream). At my QTH I have a serial data line running all over the place carrying data from a datalogger etc. The line around the house was so I could put in a few displays of outside temperature etc., but it also carries time and date, derived from a 10 MHz oven controlled crystal oscillator, so that is my clock's reference.

In my first cut of the code to sync to the serial data, I compared the time, if the clock was slow, I would decrement the 1Hz timer value, speeding up the clock, likewise if it was fast, decrement the timer value, Great, or so I thought until I did a data dump and graphed it.



As you can see, it starts out bobbing up and down tracking the master, then whammo. In electronic terms, I have way too much feedback, and that usually leads to uncontrolled oscillation.

I then had a second thought on how to do it. Now the clock on seeing it is fast will retard the 1Hz 'tick' by adding a 10th of a second to the timer, likewise if slow, it will trim a tenth off the 1Hz delay timer, making it run fast, - for one cycle only. The software keeps a track of these corrections, and if enough are made, then the main timer will be tweaked. I.e. one tweak a day, or thereabouts, not the 5 or so a minute, that created this runaway mess.

Now I know most of you won't have anything like this set up, however there is internet time, if you happen to have a computer that is on all the time (i.e. security recorder etc.) then maybe you could install a small program to output internet time out a spare serial port. - Come to think of it, even if the computer is only on occasionally, it could also be made to work.

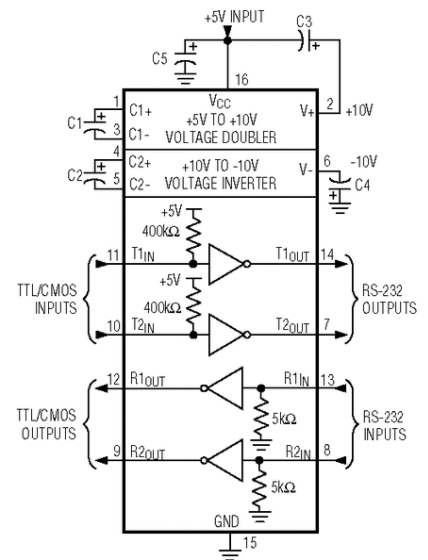


This leads us to the next part, a serial interface. The Arduino Nano has a USB interface, however when it is connected to a computer, the AVR micro gets reset, this is all part of the Arduino programming setup. Fine for programming, a pain for other uses. If you prefer USB, then you either have to hack your Arduino to break that reset line, or install a secondary USB module, leaving out any optional reset lines.

In my case I was after an RS232 style interface, they are capable of sending data a lot further than a USB can, and in my case I wanted to connect several display units up to the same serial data line. Normally for RS232 I would recommend using a MAX232 IC, they provide 2 transmitters & 2 receivers, and can generate the plus & minus 12V supply rails all from a 5V supply source,



Of course you can also buy a pre-assembled module like this one. These are great for installing into a project box, as the board can



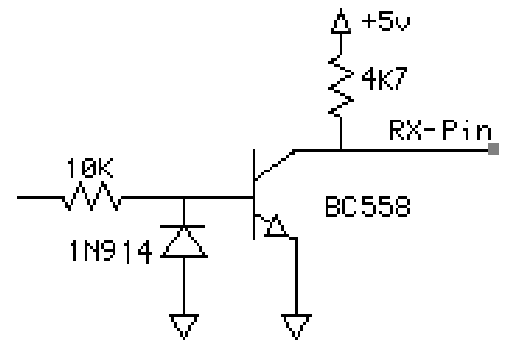
be supported by the DB9 connector, leaving just a few lines to connect to your main board.

In my case this was total overkill as I only required serial receive, so I came up with a

simple single transistor solution ages ago (as part of my previous clock designs)

On the Arduino, it's even simpler as there is already a pullup on the board, so you don't need the 4k7 resistor.

In the end, my clock is trailing the master by under half a second, not bad considering how the time is transferred from the master to the slaves – probably too many steps, with no regard to it being used to synchronise an external clock – that use of the system came somewhat later.

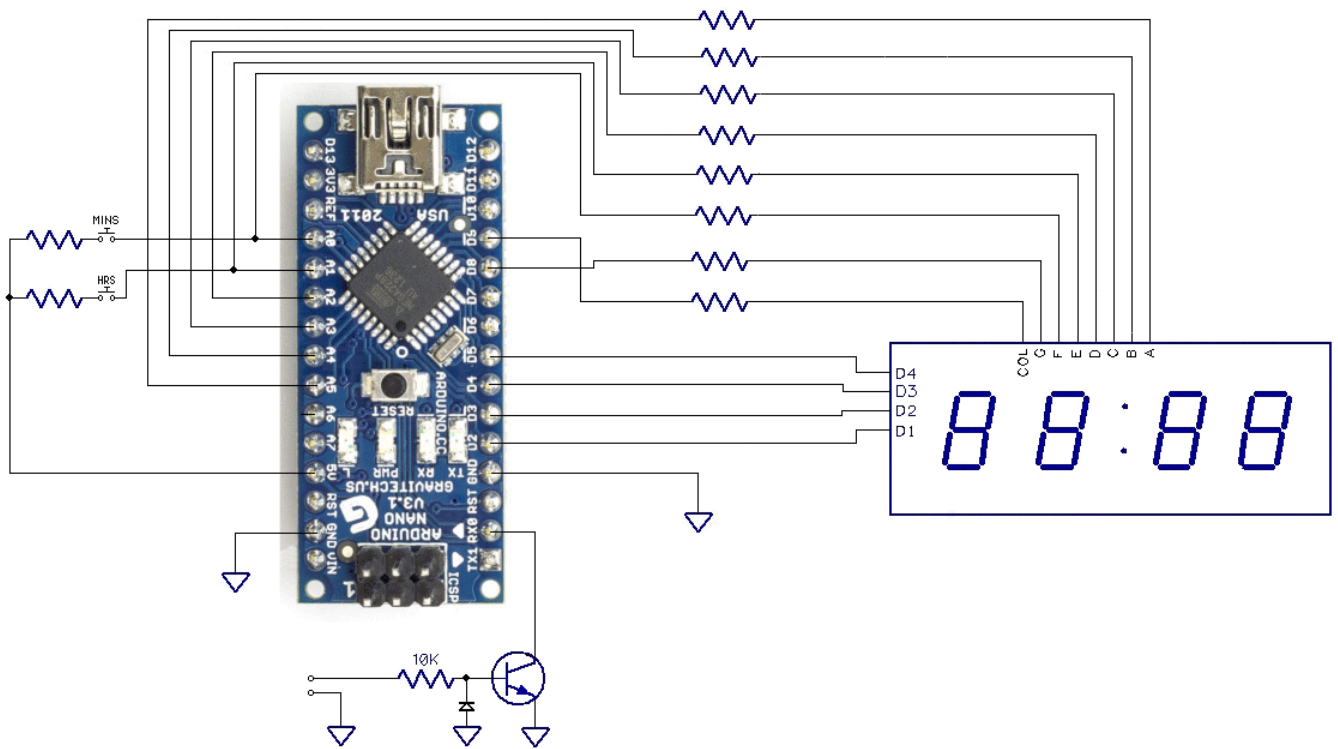


Now what clock would be complete without time setting buttons, in the end I don't really need them, however for completeness, as a magazine article, I added two set buttons, one for hours, the other minutes (The seconds are reset on each minute button press) Normally one would just connect them to a spare input pin, however I thought I would show you an alternative, and slightly sneaky method. Done this way I can add 14 press buttons without requiring one extra pin.

To do this, the button applies 5V, via a 270 ohm resistor to the display drive pins of the Arduino. As these are programmed as outputs, nothing normally happens; however, for a very short period when the display multiplex routine is swapping to the next display, it temporarily swaps these outputs, to be inputs, reads the buttons, and then resets them back to outputs again. This is all done so quickly that it has no effect on the display. As there are 8 segment & 6 digit drive outputs, there is a potential for 14 buttons – almost something for nothing.

The reason for the low value resistors on the set buttons is they have to also pull the ULN2003's inputs high, before the micro will register a login high.

The last function I added was a switch to change the clock from 12Hr format to 24Hr format, on the fly. For this I ended up using separate I/O pin. Yes, I could have done it the same as the time set buttons, however as the switch can be 'on' for an almost indefinite period, pulling a constant 10mA or so out of a pin seemed not the best idea. At present the whole clock draws about 80mA from the 12V supply, upping that to 90mA seemed stupid.



Here is the simplified circuit, as it is on my protoboard.

This shows how simple a display can be, assuming you are happy with smaller displays, and being limited to about 5 mA segment drive. If you are wondering why I have the 'G' and Colon segments driven from the other side, that's a limitation of the AVR, A6 & A7 are inputs only – You won't get any errors, they will just ignore any output requests. – one of the lovely features of the Arduino environment.

A slightly more complicated unit would involve adding a ULN2003, etc, lifting possible segment current to 25mA

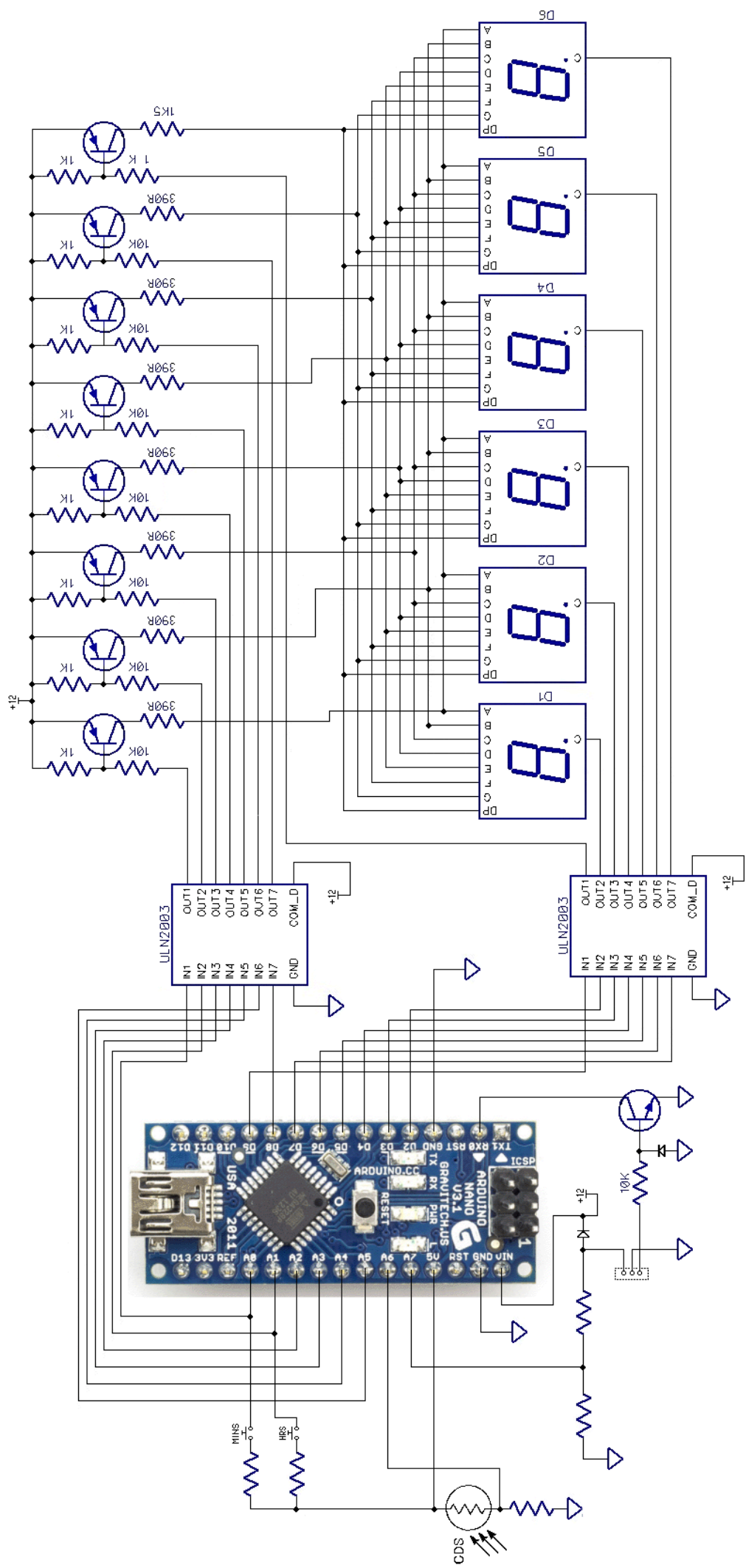
Yes, the Arduino pins can handle up to 40mA, However there is a total current limit of 200mA, on the AVR micro used, that's why you have to stop at 25mA. (Assuming no other loads)

Also, be wary of pulling too much current through the on-board 5V regulator, I ran the protoboard clock from the USB socket, either from my PC, or one of those lithium ion USB charger/battery packs. The on-board 5V regulator does not have a real heatsink as such.

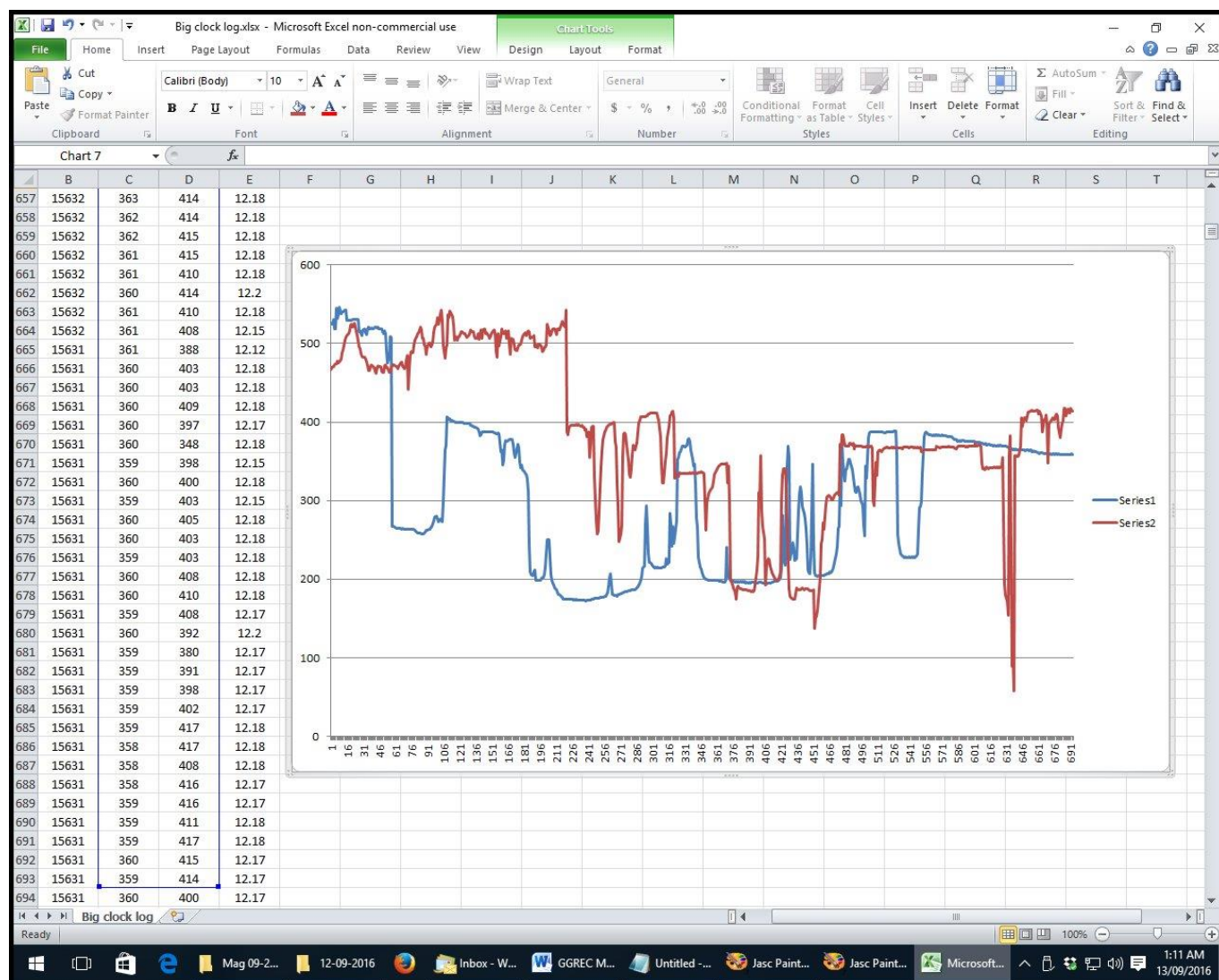
Again, watch your current, USB interfaces are quite often limited to 500mA. If you need more, build an appropriate power supply

Paul VK3TGX.





Exporting Arduino data



If you like my plots in the clock article, they are easy to obtain. Yes, you could connect an SD memory card, however I am using a simpler approach, using an attached PC. First, you need to have your Arduino sketch perform regular data dumps out the serial port, with the various values separated by commas, if you want to add units of measure, also separate them with commas, as they end up getting in the way.

```
12:00:32, 15635, 473, 12.14
12:00:33, 15635, 474, 12.17
12:00:34, 15635, 474, 12.17
12:00:35, 15635, 478, 12.15
12:00:36, 15635, 475, 12.17
```

Next you need a terminal program like TerraTerm to capture the data from the serial port and log it as a file. Next, name that file with a .csv extension, then open it with Microsoft's Excel spreadsheet,

You should be greeted with a spreadsheet with all your data in a series of cells.

If each line is all in one cell, oops you've something wrong! – go back

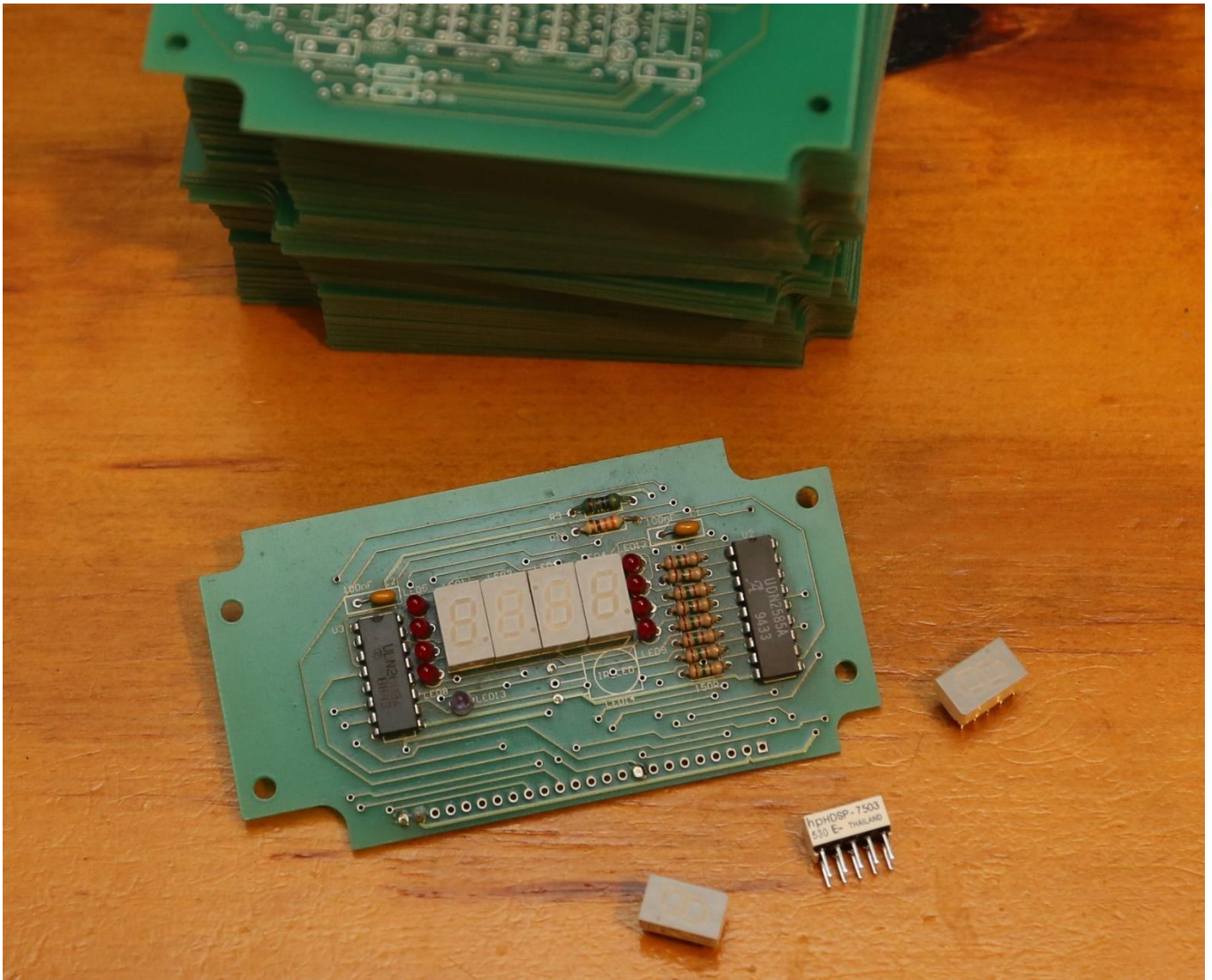
Now select a column or two of readings, then click 'insert' 'chart' - magic!

If you don't have Microsoft Office, Libreoffice also does an excellent job, for a lot less money.



Paul VK3TGX.

Arduino? Display boards



I have a good supply of these display boards, they are from a previous project, that ended up leaving me with a few leftovers. They were originally intended to be linked to a like sized Zilog Z8 base processor board; however they should make a good display board for your Arduino experiments etc.

They can carry 4 HPHSP-7503 7.62mm 7 segment common cathode displays, a ULN2003, 8 LED's configured as a 5th status display, an IR receiver & IR LED, & a few resistors. Originally the segments were driven by a UDN2584A, however these are now obsolete, not that you need it when used with an Arduino, so just link it out. (The Z8 didn't have as much drive ability)

The same goes for the ULN2003, if you are happy with reduced display drive current, or would like to load the board with common anode displays.

As you can see, plenty of boards – \$free.

However, I don't have as many displays, fewer ULN's and no UDN's

PaulVK3TGX

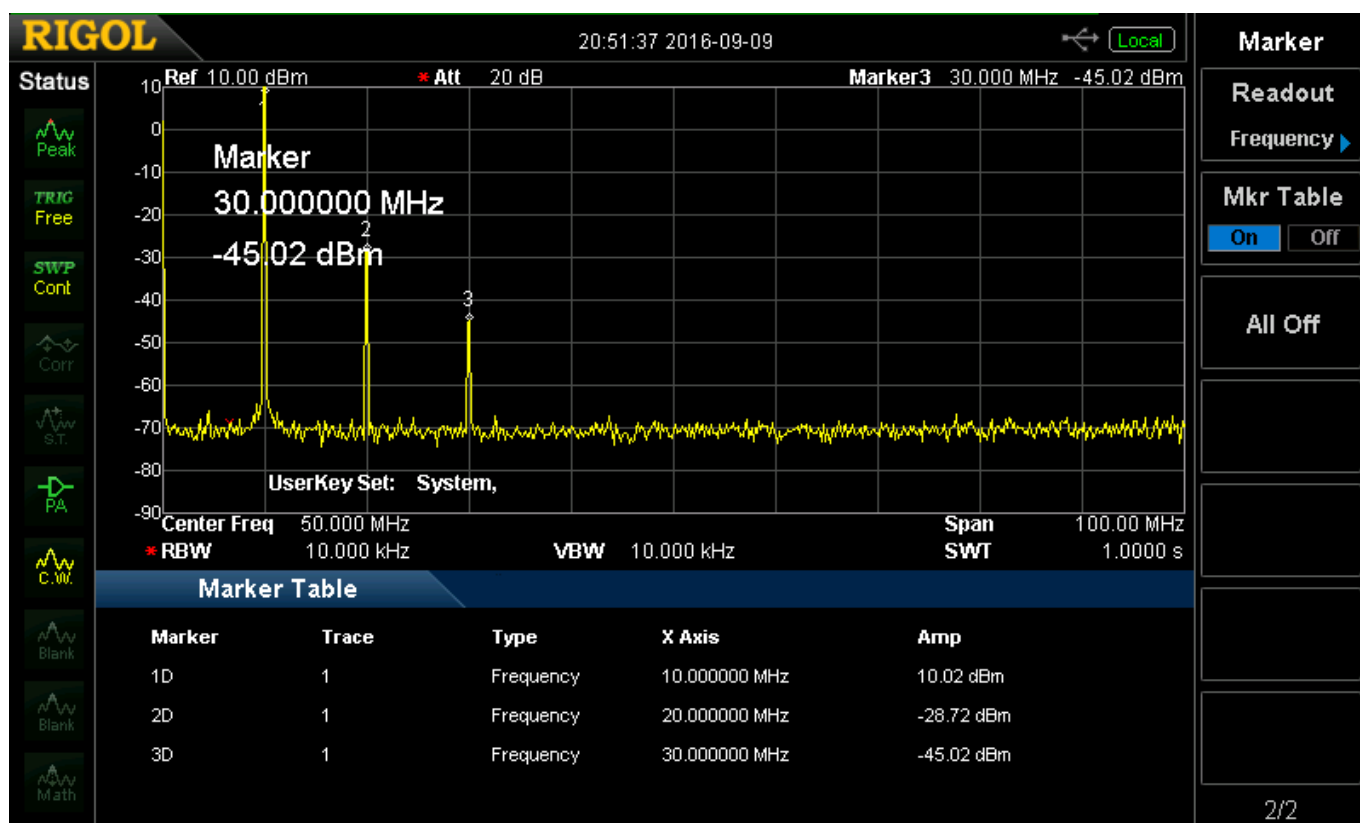
The recalcitrant 10 MHz reference

After a long hiatus from the radio and projects this year I figured I'd better get back into things before the capacitors dried out in some of the gear in the shack.... One of the first jobs on the list of things to do was to "clean up" the 10 MHz reference in the shack that had given me some grief with a few "birdies" that would pop up occasionally on some of my radios.

To try to maintain accuracy with my test equipment (and save \$\$\$ getting the equipment "calibrated" by a NATA approved laboratory every year or 2) I use a GPS disciplined oscillator that outputs a very accurate 10 MHz reference (its ADEV stability is around 2×10^{-12}) which is then fed via a distribution amplifier to some of the test gear. This includes a signal generator, spectrum analyser, frequency counter and time and frequency comparator. The test gear has the option of working from its internal reference oscillator or can be switched to accept an external 10 MHz reference for even greater stability and this is what I do. One of the other benefits of this configuration is that you don't have to wait for the equipment to warm up and stabilise after switch on (usually $\frac{1}{2}$ an hour or so) if you want to spot check a frequency, its already locked to the house reference which runs 24 hours a day, 7 days a week.

So with this additional 10 MHz cabling around the shack I was finding birdies in radios that shouldn't have been there, meaning I had a "leak" in the 10 MHz cabling somewhere... Another point worth mentioning is that it wasn't so much the actual 10 MHz signal causing issues, it was the 20 MHz and 30 MHz harmonics that were causing the problems. The 10 MHz signal reference signal runs at 10 dBm in level with the 2nd harmonic around -29 dBm and the 3rd harmonic at -45 dBm. What I needed was a filter on the output of the GPSDO to clean up the 10 MHz signal by reducing the harmonics...

Output of the GPSDO 10 MHz reference signal and harmonics

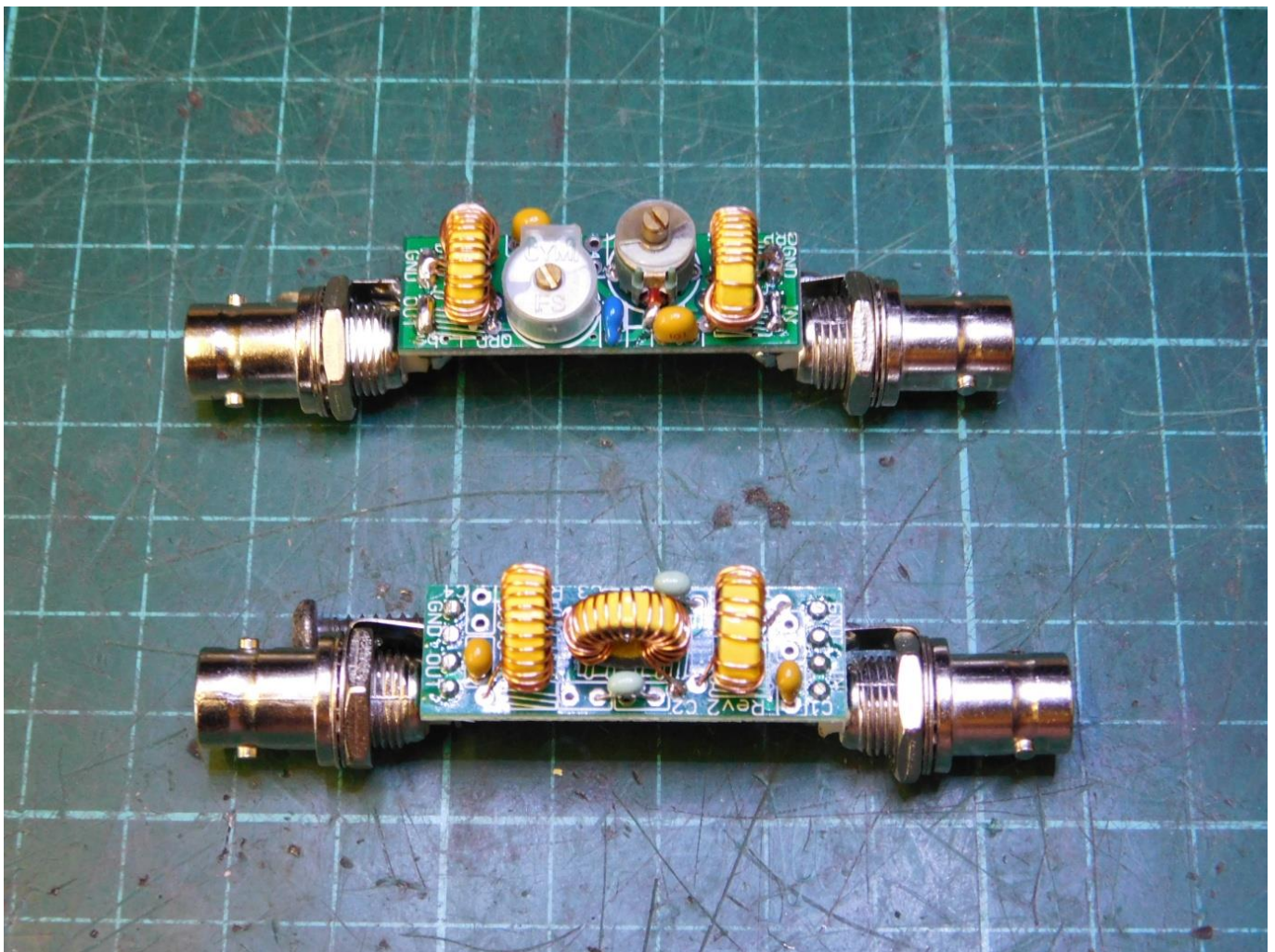


As you can see from the above the 4th harmonic and beyond were negligible, down in the noise floor @ 70 dB below (a ratio of 10,000,000 times) the fundamental frequency.

What was needed was a filter, either band pass or low pass to reduce the harmonics on the reference so I had a look around at what sort of filtering was available and found this website, QRP Labs over in Britain.

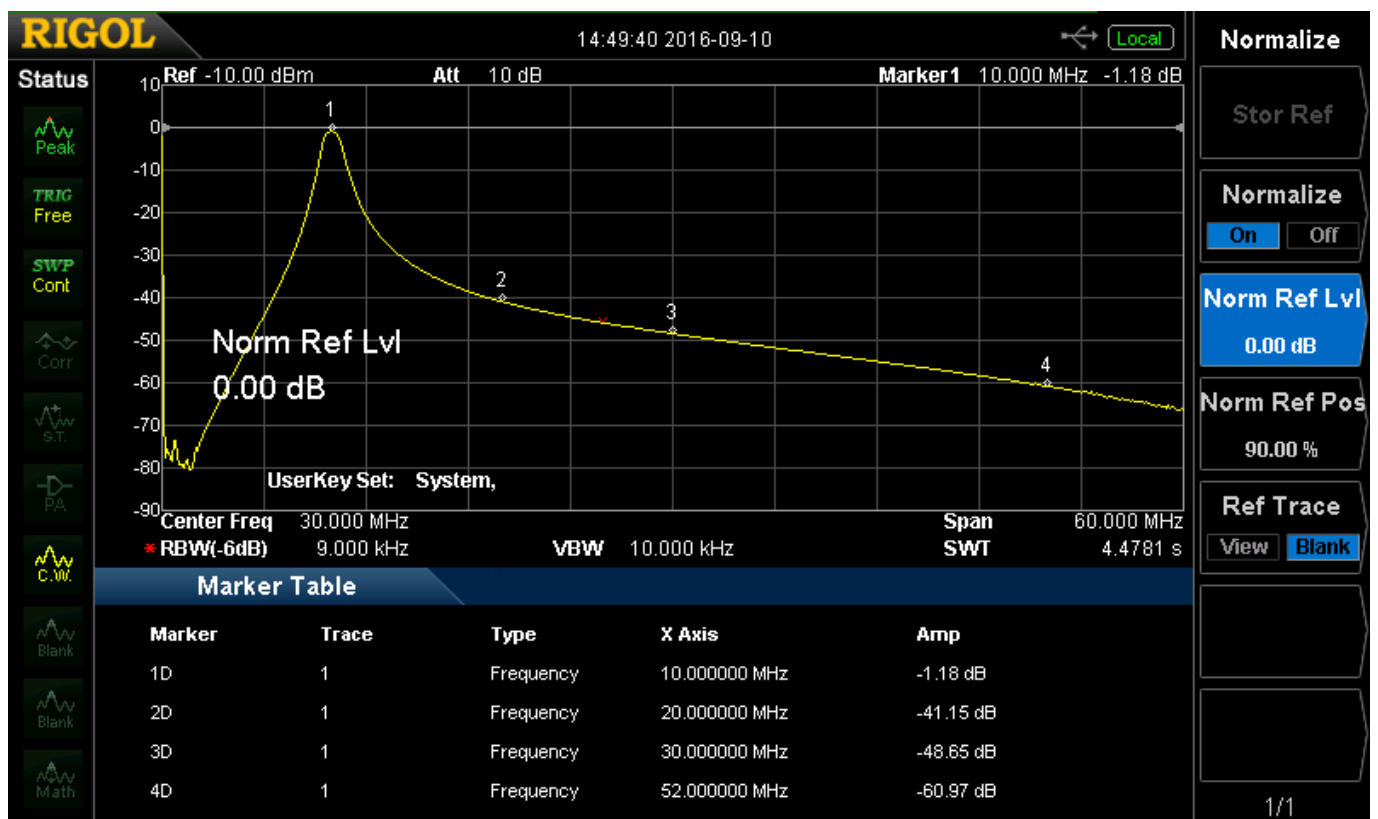
<http://grp-labs.com/lpokit.html>

They had some low pass and band pass QRP filters which if selected for 30 Metres (10 MHz) would fit the bill nicely. I ordered one of each and when they arrived I got straight to work and built both of them.

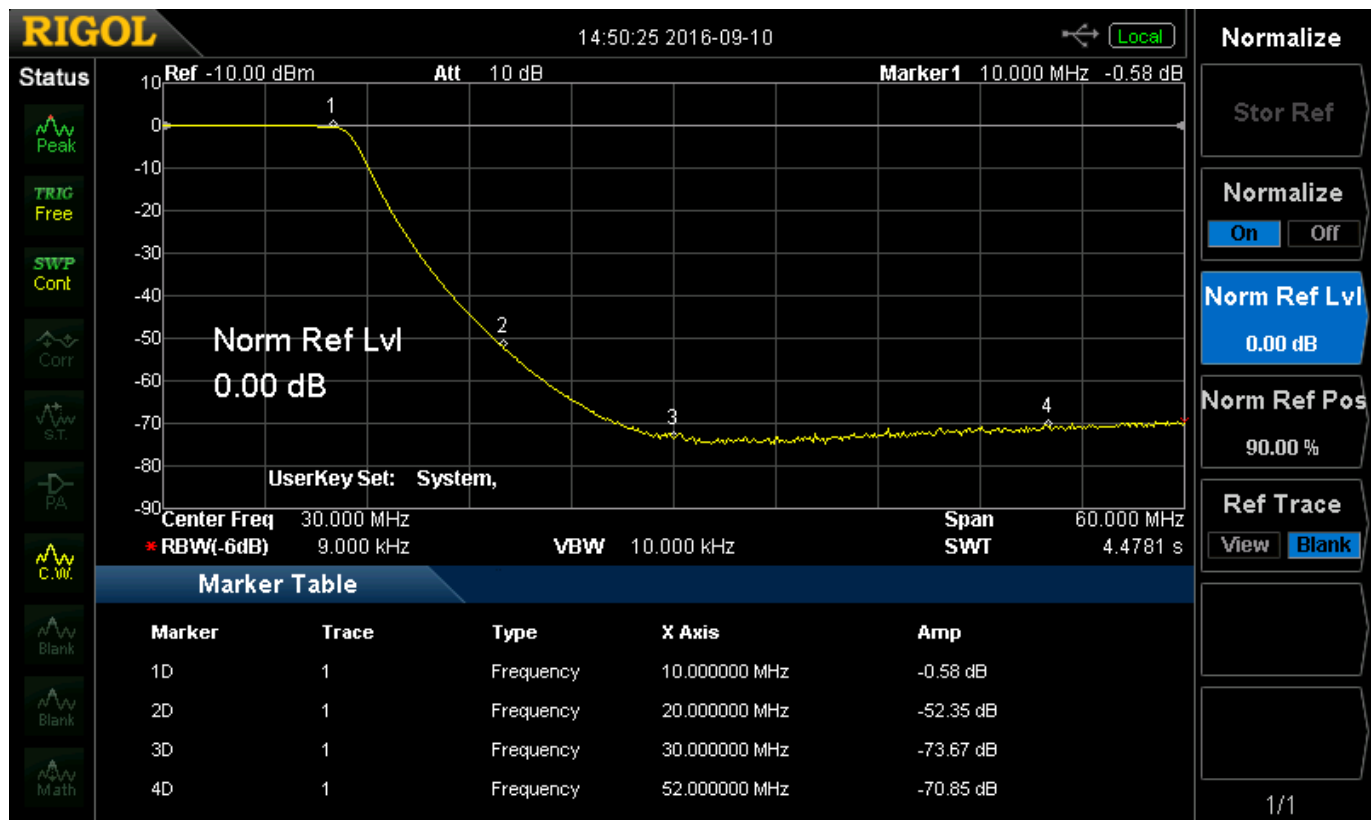


Testing the filters gave the following results;

Firstly, the band-pass filter,

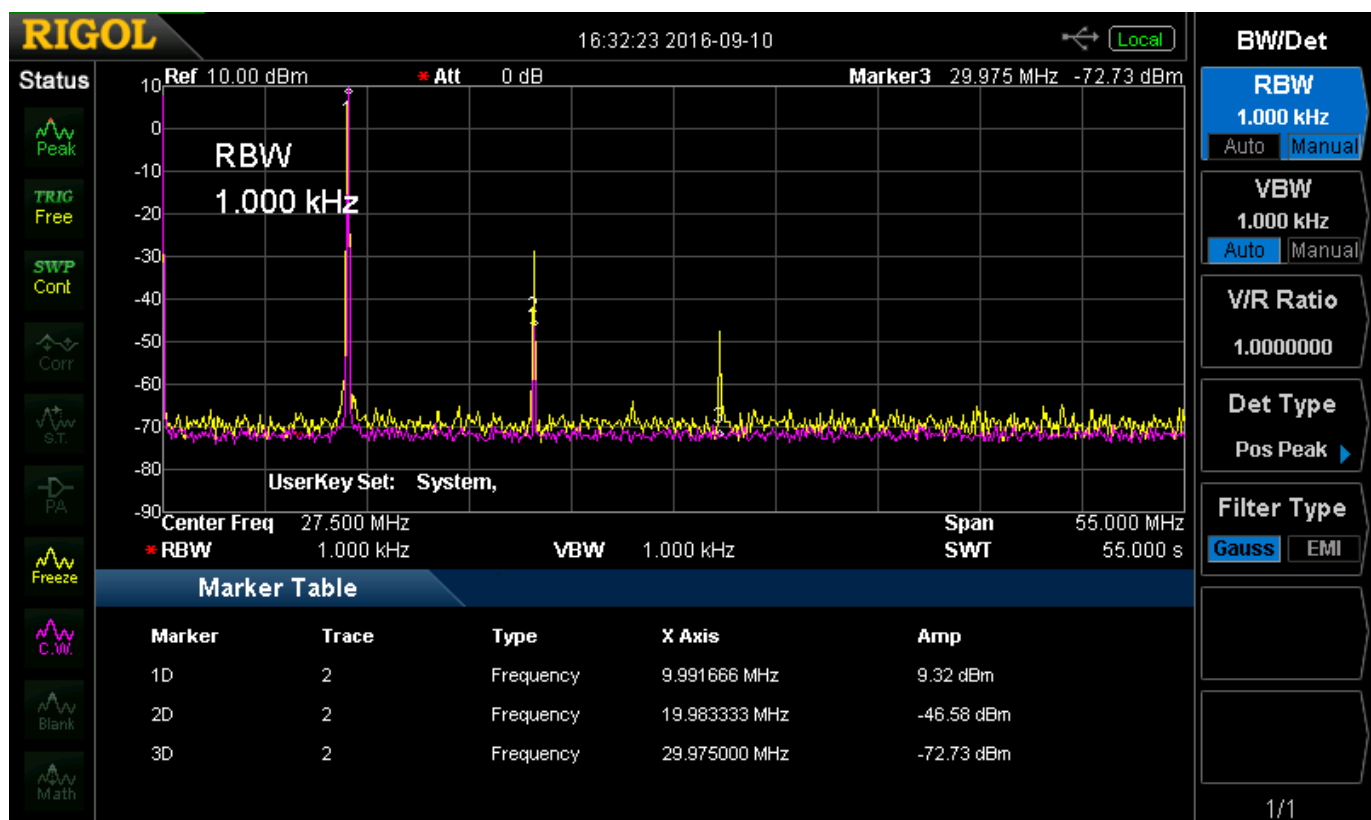


Followed by the Low pass filter,



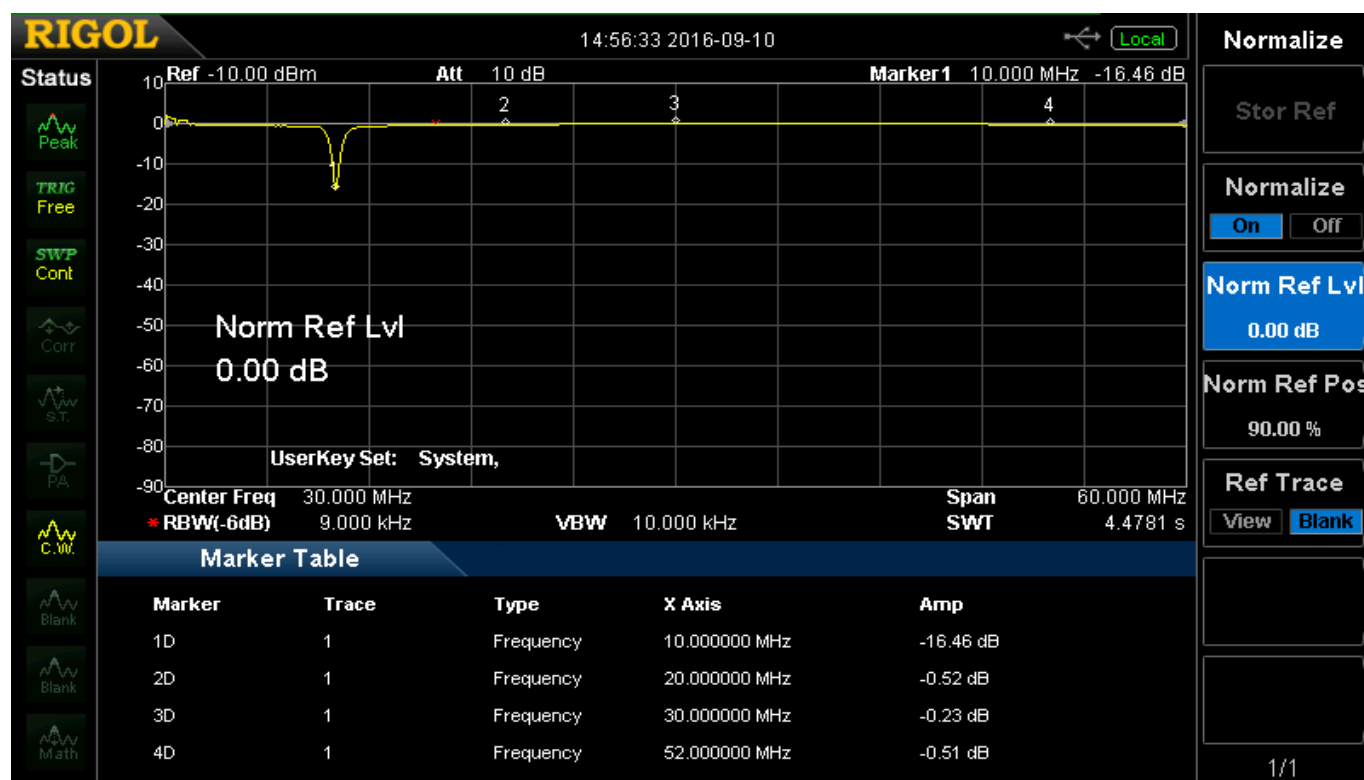
Looking at the filters the band pass filter had a slightly higher insertion loss at 1.18 dB (the low pass filter was 0.58 dB) and it didn't reduce the 2nd and 3rd harmonics as well as the Low pass filter did.

I selected the low pass filter and put it in line with the 10 MHz reference to see what difference it made.... (yellow trace = unfiltered signal, purple trace = filtered signal)

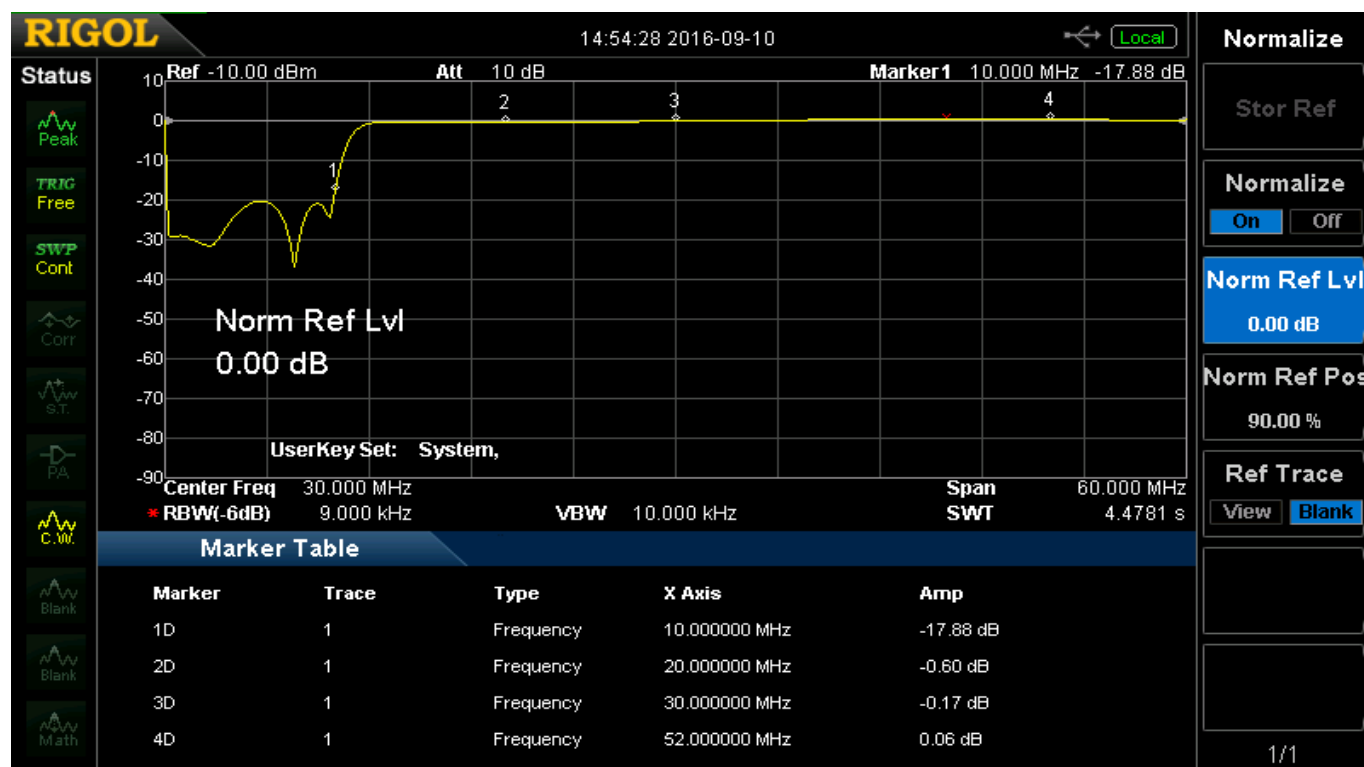


If you compare the measurements above with the initial 10 MHz sweep you will see a reduction of nearly 18 dB on the second harmonic (a ratio of 63 times better) and a reduction of nearly 28 dB on the 3rd harmonic (a ratio of 630 times better). Not bad for a \$ 5.00 filter ☺

Just for interests sake I measured the input VSWR of both filters and this is what I found...



The low pass filter above measured a return loss of -16.46 dB which equates to an input VSWR of 1.35 to 1



The band pass filter above measured -17.88 dB return loss which equates to a VSWR of 1.29 to 1. I could have spent some more time tuning this filter to decrease the input VSWR and improve the impedance matching....

All in all a nice improvement for the outlay of \$10 for 2 filters plus postage.

Has it worked ? Yes, although I'll have to spend some more time in the shack doing some testing but I'm confident I haven't made anything worse 😊

As for the 10 MHz leak I found a shoddy SMA connector which was causing one of the problems, this was duly replaced and now I do not have a 10 MHz "beat" frequency and harmonics floating around inside the shack.

Rob

VK3BRS

The recalcitrant 10 MHz reference

Addendum

After looking at the input VSWR of the low pass filter I decided that I should try to improve its impedance matching that would give me an overall improvement of the filter performance.

So how do you go about adjusting a non adjustable filter?



Obviously the first way is to adjust component values, ie; add or remove turns of wire on the inductors or increase or decrease the value of the coupling capacitors on

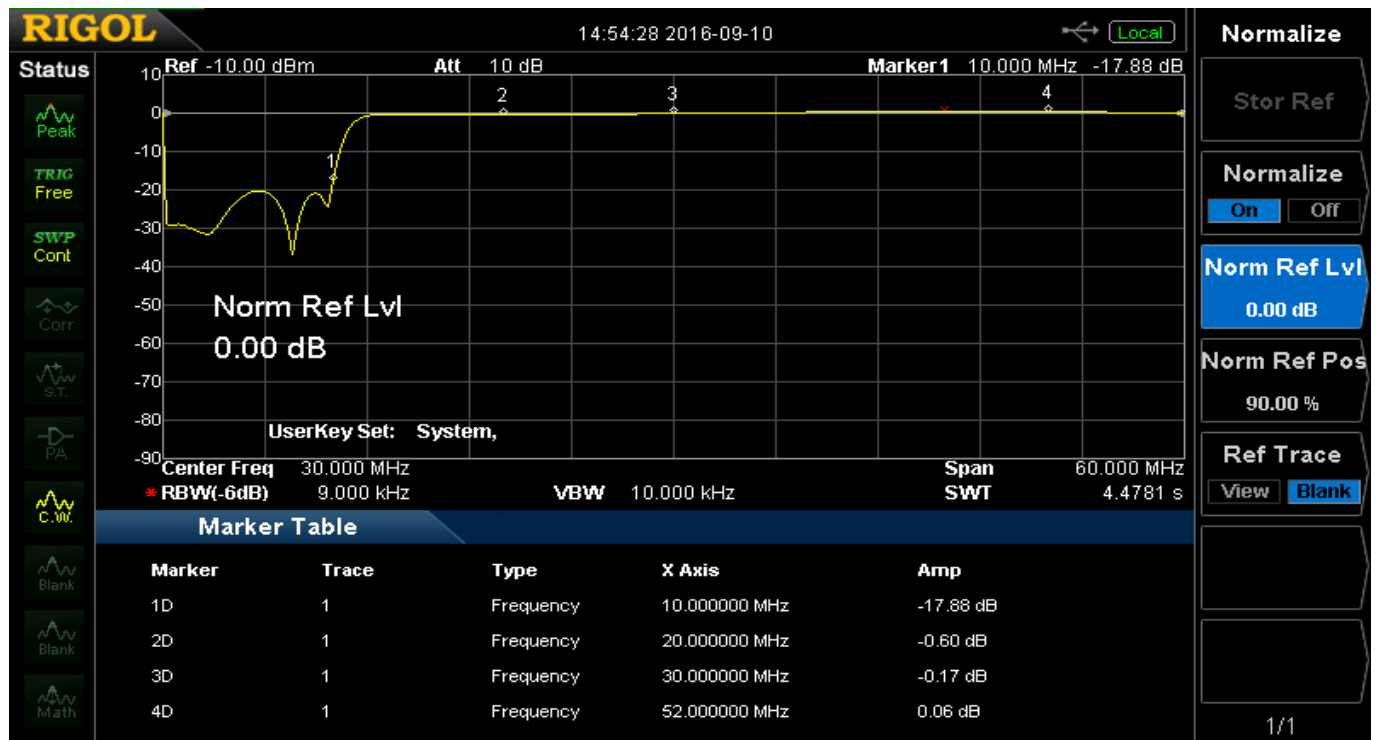
the board. A bit of work involved and with the measurements I had taken previously it was not really necessary as the filters were very close to their design. What I need was some fine tuning to get them as good as they could be.

One of the tricks I was shown many years ago when tuning circuits with toroidal inductors was to compress or expand the windings around the core, this basically increases or decreases the inductance of the inductor by a small amount.

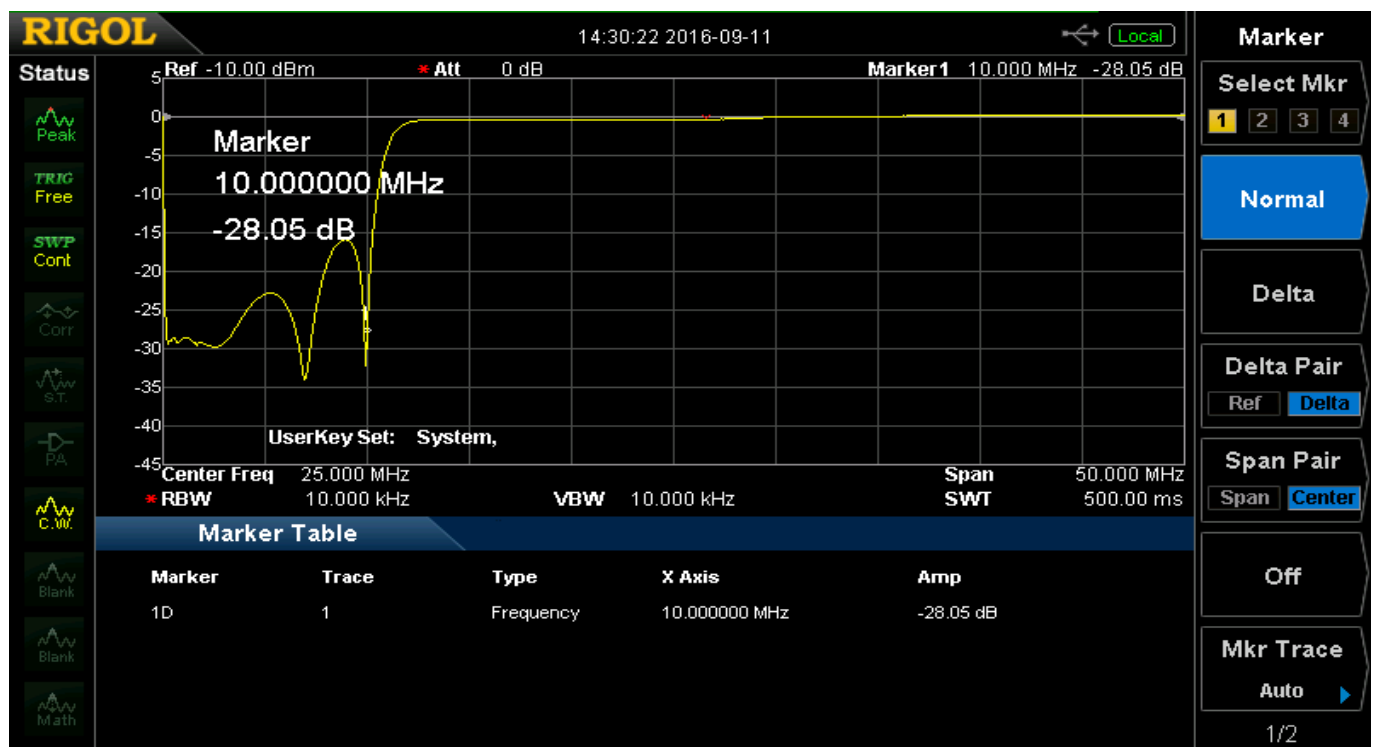
After about 5 minutes of squeezing and expanding the windings of the inductors on the filter board I had improved the input VSWR of the filter greatly, you can see the unequal windings around the front and back cores,



Before adjustment the filter had a return loss of -17.88 dB which = VSWR of 1.29 to 1 @ 10 MHz

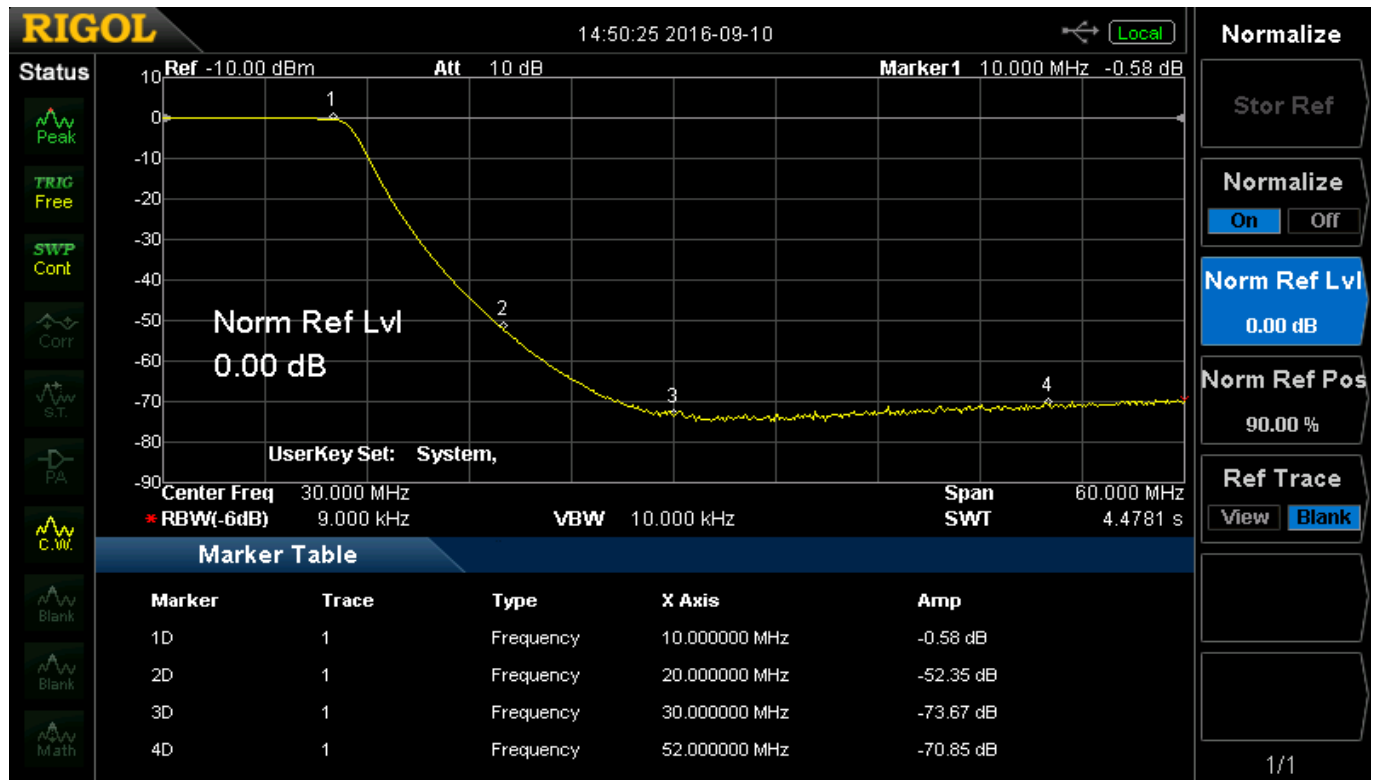


After adjustment the filter now had a return loss of -28.05 dB which = VSWR of 1.08 to 1 @ 10 MHz . Quite an improvement.

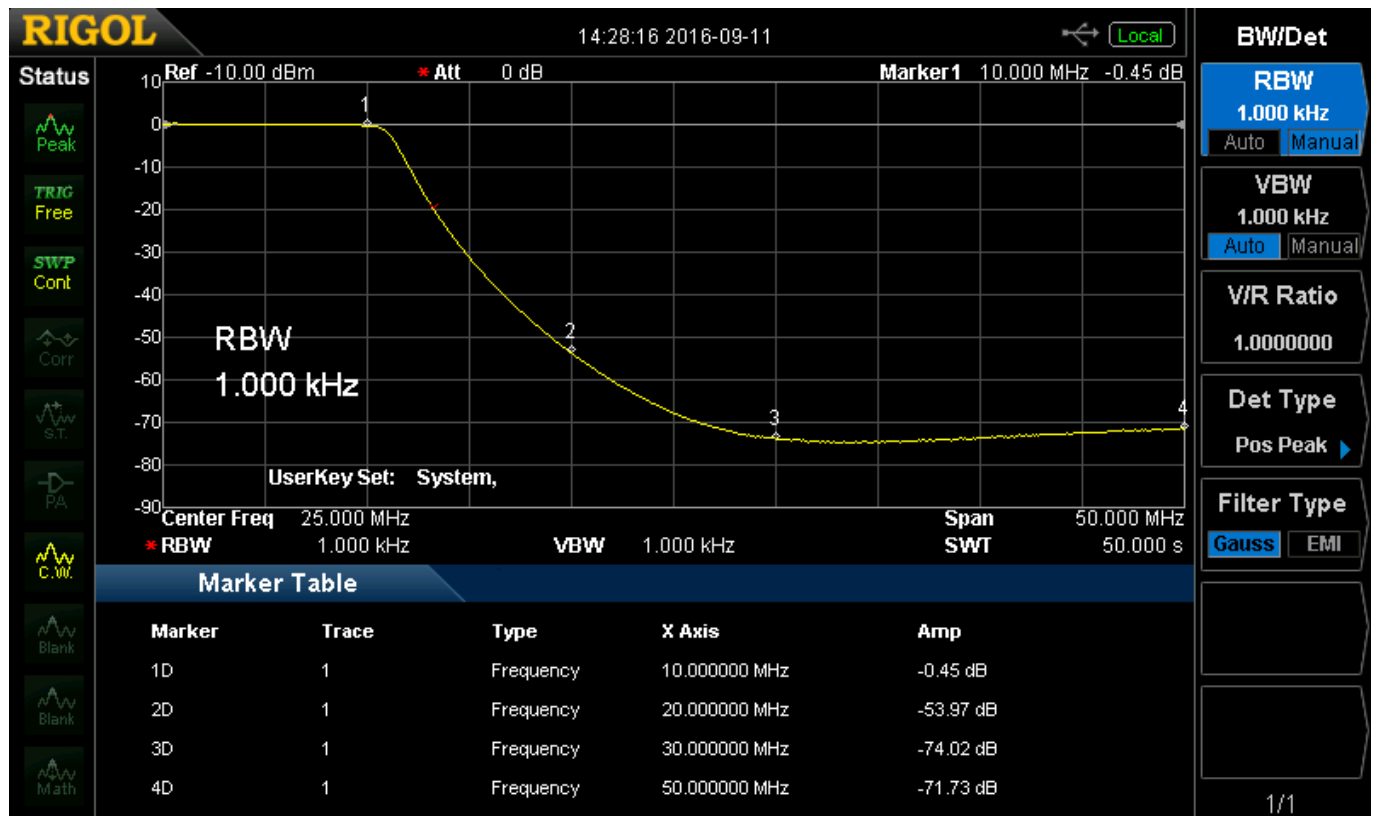


Now to see if we had changed the characteristics of the filter.

Before adjustment of the inductor windings,



And after adjustment,



The insertion loss has improved from 0.58 dB to 0.45 dB @ 10 MHz

The attenuation has increased by 1.62 dB @ 20 MHz, 0.35 dB @ 30 MHz and 0.88 dB @ 50 MHz

It just shows that with a bit of care when doing something like this can yield improvements from a standard kit at a minimal cost. This has to be a good thing for Amateurs in general with their experimentation 😊

73,

Rob

VK3BRS

RTTY Night



AUTHOR UNKNOWN

I WON 24 BOTTLES OF WHISKY IN A 'JACKPOT' AT POKER AND I HAD 18 BOTTLES IN MY CELLAR WHEN I WAS TOLD BY MY XYL TO EMPTY THE CONTENTS DOWN THE SINK.....OR ELSE.

I SAID I WOULD, AND PROCEEDED WITH THE UNPLEASANT TASK.

I WITHDREW THE CORK FROM THE FIRST AND POURED THE CONTENTS DOWN THE SINK WITH THE EXCEPTION OF ONE GLASS, WHICH I DRANK.

I THEN EXTRACTED THE CORK FROM THE SECOND BOTTLE, AND DID LIKEWISE WITH THE EXCEPTION OF ONE GLASS, WHICH I DRANK.

I THEN WITHDREW THE CORKS FROM THE THIRD BOTTLE AND POURED THE CONTENTS DOWN THE SINK, WHICH I DRANK.

I PULLED THE BOTTLE FROM THE CORK OF THE NEXT, AND DRANK ONE SINK OF IT, AND THREW THE REST DOWN THE GLASS.

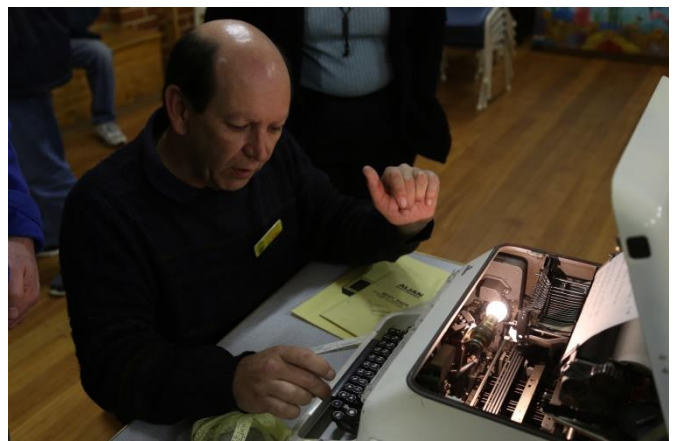
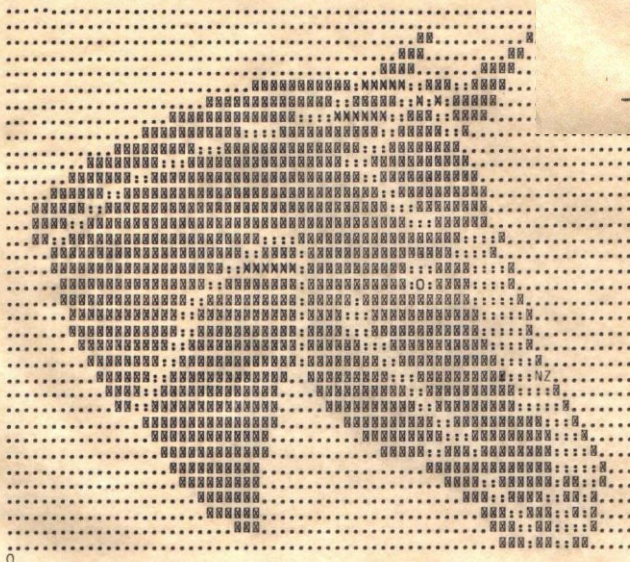
I PULLED THE SINK OUT OF THE NEXT GLASS, AND POURED THE CORK DOWN THE BOTTLE, THEN UNCORKED THE SINK WITH THE GLASS, BOTTLED THE GLASS, AND DRANK THE POUR.

WHEN I HAD EVERYTHING EMPTIED, I STEADIED THE HOUSE WITH ONE HAND, COUNTED THE GLASSES CORK AND BOTTLES WHICH WERE 29, AND AS THE HOUSE CAME BY AGAIN, I COUNTED THEM AND FINALLY HAD ALL THE HOUSES IN ONE BOTTLE WHICH I DRANK.

I AM NOT HALF AS THINK AS YOU MAY DRUNK. I FOOLS SO FEELISH AND I DON'T KNOW WHO IS ME, AND THE DRUNKER I STAND HERE THE LONGER I GOT.

I'M NOT AS SOME THINKLE PEEP I AM, UNDER THE AFFLUENCE OF INCOHOL.

FOR SHALE..... 18 EMPTY SCOTTLES OF BOTCH.



& Other Pictures



General Meeting Minutes

GGREC General Meeting Minutes for August 19, 2016

Start: 8:25pm
Location: Guide Hall
Chairperson: Ian Jackson, VK3BUF
Minute Taker: Dianne Jackson VK3JDI

Treasurers Report: Tabled by Graeme Brown, VK3BXG, 2nded Leigh VK3FACB, accepted ok.
Included a brief report on the Hamfest Sale

Previous Minutes: As distributed

Business Arising:

- ♦ Hamfest Sale was a great success. Sausages sold well out the front.
- ♦ Name badges ordered by members will be available at the next meeting.
- ♦ Arduino sessions to move to Monday nights. About 20 people interested, maybe move the sessions into the Guide hall.
- ♦ A new Membership List was circulated.
- ♦ The new white board was purchased from a company in Hallam. Cost was 256, including dusters, installed by Albert & Ian.
- ♦ Ian asked if there were any recommendations for Guest Speakers.
- ♦ Some low-cost Icom 2M transceivers were available from China. Anyone interested?
- ♦ JOTA – Unknown if it will go ahead this year. Guides to be contacted.

General Business:

- ♦ Paul VK3TGX suggested that we could return to radio theme nights where guest speakers are unavailable.

Meeting Closed: 8:53pm



Club Information



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

Office bearers

President	Ian Jackson	VK3BUF	Repeater Officer	Albert Hubbard	VK3BQO
Admin Sec	Michael Van DenAcker	VK3GHM	Web Master	Mark Clohesy	VK3PKT
Treasurer	Graeme Brown	VK3BXG	Magazine Editor	Paul Stubbs	VK3TGX
General 1	Rob Streater	VK3BRS	Property Officer	Bruno Tonizzo	VK3BFT
General 2	Max Hill	VK3TMK	Secretary	Ian Jackson	VK3BUF

Call in Frequencies, Beacons and Repeaters

The Club Station VK3BJA operates from the Cranbourne Clubrooms.
6m Repeater VK3RDD – Currently de-commissioned until further notice - *sorry*
70cm Repeater Cranbourne VK3RLP In 434.475MHz Out 439.475MHz CTCSS 91.5Hz
VK3RLP Repeater supports Remote Internet access (IRLP), Node 6794.
70cm Repeater Drouin VK3RWD In 433.575MHz Out 438.575MHz CTCSS 91.5Hz
Simplex VHF - 145.450MHz FM • Simplex UHF - 438.850MHz FM
VK3RLP Beacons 1296.532MHz & 2403.532MHz

Membership Fee Schedule

- Pension Member rate \$25.00 Extra Family Member \$20.00
Standard Member rate \$40.00 Junior Member rate \$25.00
Fees can be paid by EFT to BSB 633000 - Account 146016746.
• Always identify your EFT payments.
• Membership Fee's Are Due at each April Annual General Meeting.

Magazine Articles to editor@ggrec.org.au or vk3tgx@gmail.com
All other Club correspondence to: secretary@ggrec.org.au
or via Snail Mail : GGREC, C/O Ian Jackson, 408 Old Sale Rd, Drouin West 3818
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