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The CQ-DATV editors gratefully acknowledge all those authors that have contributed articles for this free magazine.

Production Team

Ian Pawson G8IQU
Trevor Brown G8CJS
Terry Mowles VK5TM
Jim Andrews KH6HTV

Contributing Authors

Jim Andrews KH6HTV
Trevor Brown G8CJS
Peter Cossins VK3BFG
Bill Eberle AB0MY
John Hudson G3RFL
Don Nelson N0YE
Mike Stevens G7GTN

Editorial

Welcome to CQ-DATV 86

First the news from our Facebook group. We are still getting joining requests from people who do not know the wavelengths involved for 144MHz operation or the names of the UK or USA analogue colour TV systems.

These applications tend to turn up in batches and we are declining them as the product of a "lets add a whole load of none related Face Book groups to your profile" APP. Sorry if you have been declined please try again.

CAT 20 (not quite sure of the numbering system as Trevor went to CAT 70 and it was some time ago). This year's date is set for 24th and 25th of October, but this year it's an On-Line only event.

Rudi s58ru our member in Slovenia has written a long letter asking for a common DATV standard with more affordable equipment. Some of us still remember Digilite Rudi, this was often called the poor mans Digital ATV, so perhaps the team behind this project were foresighted and saw this spiralling cost problem in ATV's future.

The Digilite book is in the CQ-DATV on-Line library. Its dated now but it was at the time a very interesting constructional project that the team supported with a PCB and pre-programmed USB ports.

Rudi may be right! We have lost our way a little and gone too far down the ''write a cheque then plug and play' rather than the true path of home construction.

Lucien F1TE has news of Minitiouner changes with the ability to separate 14/18v on both NIM inputs.

Trevor and Mike are still working on the Grass Valley panel and have added an OLED display and are planning a one off PCB run for the Vmix interface.

So if you have a panel or looking to buy one in the future, "listen very carefully I will say this only once". This will be a one off, pre order. Please don't come back after the order has gone in, asking for a PCB.

Three reports from Jim KH6HTV, the first one on Hi Definition Digital ATV using the 5, 10 and 45 GHz bands. The second one on the NanoVNA network Analyser, these analysers were once the exclusive domain of the big boys and well outside amateur prices, but at $50 "How could you go wrong".

Jim's last report is on 70cms driver amplifiers and the use of CATV parts. Jim decided to build up a couple of amplifiers in Hammond die-cast enclosures (1590ABK) and see how well they would work for DVB-T. Lets not spoil it for you the full story is in this issue.

Peter Cossins VK3BFG reports on the move of VK3RTV after 40 years on the Victorian Education Department site at Olinda, the site has been lost and the equipment moved to Telstra's historic site at Surrey Hills.

The Victorian Education Department site at Olinda was decommissioned and the tower disassembled in January 2018. After an extensive search, no site could be located on Mount Dandenong that did not incur a significant annual cost. Sorry Peter this has happened to so many of us.

Bill Eberle AB0MY and Don Nelson N0YE Have reported in the Boulder ATV news letter on receiving DVB-T on a Raspberry Pi.

Take note Rudi this sounds an affordable solution to DATV costs.

Another rabbit out of the hat, proving a monthly electronic ATV magazine is possible and does not cost the earth, well in fact lets go one better, it does not cost anything at all, it's a free download.

The team behind the publication do work hard and they often feel a few more helpers might enable them a little more family time, as one of them remarked the other week "PC went down, talked to the family, they seem a nice bunch of people" .

The hint behind the joke is we would like more helpers. If not to write copy although that is always welcome, but to track down copy, report from other parts of the world or even just do some proof reading.

You know where to contact us *editor@cq-datv.mobi*

Please sit back and enjoy CQ-DATV 86 and accept our assurances that electronic magazines are 100% free from COVID 19 risks.

Please note: articles in this magazine are provided with absolutely no warranty whatsoever; neither the contributors nor CQ-DATV accept any responsibility or liability for loss or damage resulting from readers choosing to apply this content to theirs or others computers and equipment.

CAT 20 To be an Online and On-air Only Event

As just announced in CQ-TV, we had planned to hold CAT 20 and the Biennial General Meeting at the Midland Air Museum, Coventry on the 24/25 October. Given the current situation, we have made the decision that the event will go ahead on the same dates, but online and on-air only.

This is an early decision so that we can put the best possible package of lectures, discussion and activity together. We will not be holding a Biennial General Meeting during the weekend as the Constitution allows us 3 years from the date of the last meeting (16 September 2018) to hold the next one.

We plan to host the interactive parts of the meeting using Zoom, and also stream all the lectures on the BATC Streamer. Selected highlights will be transmitted as contacts on QO-100. The programme will look something like this:

Saturday 24th October

- *1000 Zoom online for testing connections.*
- *Breakout Rooms open for specific discussions (trading?)*
- *1330 Introduction – Dave G8GKQ, BATC Chairman*
- *1340 First Lecture*
- *1700 End of Lectures for Saturday*
- *2000 Special QO-100 Net for CAT 20 (to be streamed as well)*

(Bring your favourite beverage – as for the CAT 20 Dinner)

Sunday 25th October

- *1000 Start of Lectures*
- *1300 Closing Comments – Dave G8GKQ, BATC Chairman*

I am please that David G4NRT has agreed to be our first speaker to talk about "Producing Professional Internet Streaming" – very appropriate for this year's event! I would welcome other volunteers to speak on any ATV-related subject.

So, please make sure that your diary remains clear for the weekend of 24/25 October. If you get a chance to use Zoom, take the time to get to know it – we will publish full instructions as well. And the BATC Streamer will also carry all the content.

It would be good to get the maximum number of members onto the QO-100 net on the Saturday evening. The format will be similar to the regular Thursday night nets, but only one over each, with a maximum of 3 minutes. Light-hearted but appropriate content please!

We will try to arrange a real meeting as early as possible in 2021.

Dave, G8GKQ BATC Chairman

A wake-up call from Slovenia!

Hello
ATV has a problem for the radio clubs, for the national associations, for the IARU and we must not forget the amateur radio.

I jumped on this ATV train among the last ones.
At the beginning there were national contests and IARU

contests. We had eleven repeaters, our own electronic newspaper, one day a year dedicated to ATV, and then DVB-S arrived …

If we compare the work on the SHF and ATV we see that the latter is much more demanding and more expensive.
The SSB event brought innovation. Did the DVB event bring any innovation?

The prices of the TX DVB-S has skyrocketed. DVB technology has gone to the factory labs and the Radio Amateur has little say.

The radio club eliminated the builders from their ranks, as did the national associations and the IARU. Without constructors, the Radio Amateurs must buy what is on the market, but here there are only goods for large bulk buyers. Nothing is found for the ATV niche and the ATV contests are almost all gone.

To understand what the national associations organizes other than the IARU contest, we spent several years emailing everyone.

The IARU is a "static, plastered" organization. For any positive changes, in the amateur radio field must takes at least five years.

National associations and radio clubs lag behind IARU, leaving Radio amateurs confused and embittered. They don't know what route to take: Analogue, DVB-S, DVB-T, DVB-S2, DVB-T2, nothing, …

The DVB-S was presented to me at an ATV day in 2005. Is it mentioned in the regulations of the IARU ATV contest of this year? How do we recover? It will be difficult, if not impossible.

I do not see ATV as a competition for professional stations, I only see contests a possible outlet.
73 s58ru

Personal Thoughts from Trevor G8CJS

Thanks Rudi, please excuse Google translate for your Italian letter, it is after all, digital technology.

ATV is going through a change and like you I think we all need to get together an map out a future. CQ-DATV is a free monthly magazine. We have no connection with contests, standards, national societies or the IARU, we just do our best to provide a platform that enables ideas to be exchanged.

I started with ATV in the late 60's and ATV was a relatively cheap addition to 70cms amateur radio. A modified domestic TV tuner and home built pre-amp for the receive side and a two stage Tripler and PA using two QQV02/6 valves. It was not all plain sailing we had 405 v 625, AM changed to FM not

as bad as Analogue, DVB-S, DVB-T, DVB-S2, DVB-T2. When we moved to 23cms FM this enabled sound to be combined with the video transmission and power amplifiers to be pushed hard. None of it involved a huge expensive outlay, at least not at my end.

The local clubs also managed to fund 23cms ATV repeaters (I built GB3ET) and so we grew. It was more a case of effort than money.

Yes we have gone Digital. We had little choice as we were taking up a lot of spectrum space. A lot of people put a considerable amount of effort into producing systems that could be used to evaluate all the different modes. The first one that springs to mind was Digilite in 2014. The idea originated in France, but Brian G4EWJ did a lot of the pioneering work assisted by Colin G4KLB, Dave Kenward G8AGN brought it to the masses he designed the PCB, put the bare kits together and I remember personally programming the USB modules and delivering hundreds of kits to the post office that went to many far off places.

OK others took over, but digital has not been forgotten it's just that we did not debate standards or get involved in using the Digilite model to plan where to go to next. I have little or no involvement these days other than like you to wish we had a common standard. This is unlikely to come from national or IARU level it's not their function, they just prove that the pen is mightier than the soldering iron.

The lack of a common standard and affordable kit is a problem and Digital has taken ATV out of the hands of the home constructor. Just reading the feedback on social media we may have become a hobby of kit buyers and software installers who just shout on the forums when it does not work. This maybe the nature of the digital innovation that we cannot easily develop and build kit on the kitchen table. I think this was the dream of Dave when he sweated over the PCB's. Every batch I saw had improvements over the previous ones and David is a sadly missed character who did so much for our hobby. All that remains is his book on the CQ-DATV download site.

I am sure others have a different view and CQ-DATV would be more than happy to publish their views. That's what we are here for, to deliver a no cost platform that will benefit out hobby.

A new coding standard - VCC

July 2020

After devoting several years to its research and

standardization, Fraunhofer HHI (together with partners from industry including Apple, Ericsson, Intel, Huawei, Microsoft, Qualcomm, and Sony) is celebrating the release and official adoption of the new global video coding standard H.266/Versatile Video Coding (VVC).

This new standard offers improved compression, which reduces data requirements by around 50% of the bit rate relative to the previous standard H.265/High Efficiency Video Coding (HEVC) without compromising visual quality. In other words, H.266/VVC offers faster video transmission for equal perceptual quality.

Overall, H.266/VVC provides efficient transmission and storage of all video resolutions from SD to HD up to 4K and 8K, while supporting high dynamic range video and omnidirectional 360° video.

Today, compressed video data make up 80% of global Internet traffic. H.266/VVC represents the pinnacle of (at least) four generations of international standards for video coding. The previous standards H.264/Advanced Video Coding (AVC) and H.265/HEVC, which were produced with substantial contributions from Fraunhofer HHI, remain active in more than 10 billion end devices, processing over 90% of the total global volume of video bits. Both previous standards were also recognized by collectively three Emmy Engineering Awards for contributing substantially to the progress of television technology.

Through a reduction of data requirements, H.266/VVC makes video transmission in mobile networks (where data capacity is limited) more efficient. For instance, the previous standard H.265/HEVC requires ca. 10 gigabytes of data to transmit a 90-min UHD video. With this new technology, only 5 gigabytes of data are required to achieve the same quality. Because H.266/VVC was developed with ultra-high-resolution video content in mind, the new standard is particularly beneficial when streaming 4K or 8K videos on a flat screen TV. Furthermore, H.266/VVC is ideal for all types of moving images: from high-resolution 360° video panoramas to screen sharing contents.

"After dedicating almost three years toward this standard, we are proud to have been instrumental in developing H.266/VVC," says Benjamin Bross, head of the Video Coding Systems group at Fraunhofer HHI and editor of the +500-page standard specification of H.266/VVC. "Because of the quantum leap in coding efficiency offered by H.266/VVC, the use of video will increase further worldwide. Moreover, the increased versatility of H.266/VVC makes its use more attractive for a broader range of applications related to the transmission and storage of video."

"If you consider that Fraunhofer HHI already played a key role in the development of the previous video coding standards H.264/AVC and H.265/HEVC, then we are happy with the fact that more than 50% of the bits on the Internet are generated by a Fraunhofer HHI technology," adds Dr. Detlev Marpe, head of the Video Coding and Analytics department at Fraunhofer HHI.

A uniform and transparent licensing model based on the FRAND principle (i.e., fair, reasonable, and non-discriminatory) is planned to be established for the use of standard essential patents related to H.266/VVC. For this purpose, the Media Coding Industry Forum (MC-IF) was founded. In addition to Fraunhofer Society, the MC-IF now includes +30 companies and organizations.

The new chips required for the use of H.266/VVC, such as those in mobile devices, are currently being designed. Dr. Thomas Schierl, head of the Video Coding and Analytics department at Fraunhofer HHI, announced "this autumn Fraunhofer HHI will publish the first software (for both encoder and decoder) to support H.266/VVC."

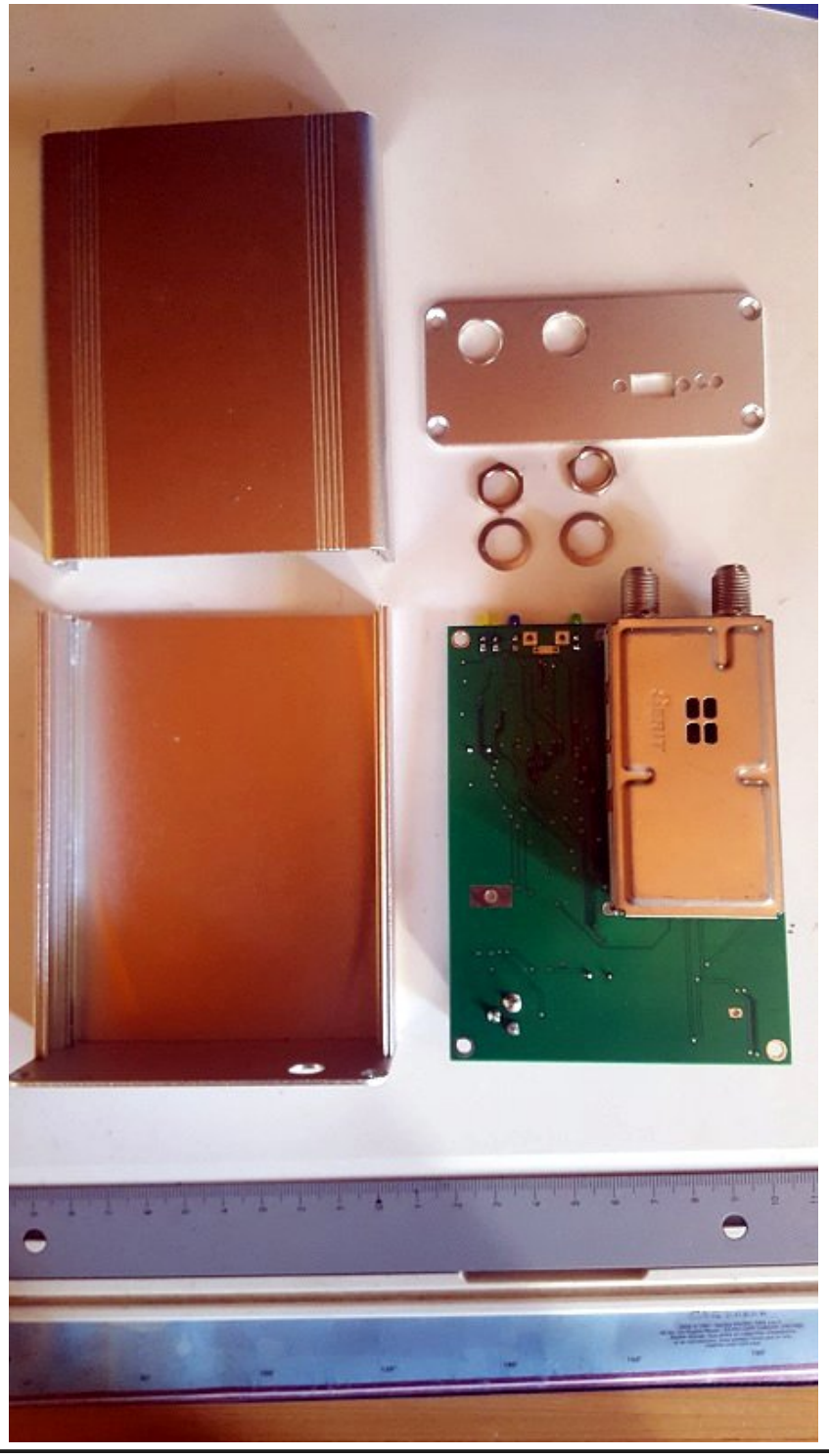
Source: *https://tinyurl.com/y93l8ew9*

Info from Lucien F1TE on the HyperFR list

I inform you that the REF will distribute a new mono TS declination of now famous Minitiouner at the beginning of the school year.

A simple channel version, compatible for connoisseurs with the Minitiouner-V2 version of the BATC. But with the ability to separate LNB 14/18 V voltages on both NIM inputs. Pre-assembly CMS card, only the NIM left to be embroidered and the LED diodes to be soldered.

Attached are some photos of the proto, still fully compatible with current F6DZP software.



Price a little below the PRO2 version, but the card will be delivered with a case. The features will a priori be equivalent to the version ELAD distributes

https://www.eladit.shop/home/SDR-RADIO-c53003380

Happy holidays everyone. 73, Lucien F1TE

Grass Valley Mixer Conversions - Part 19

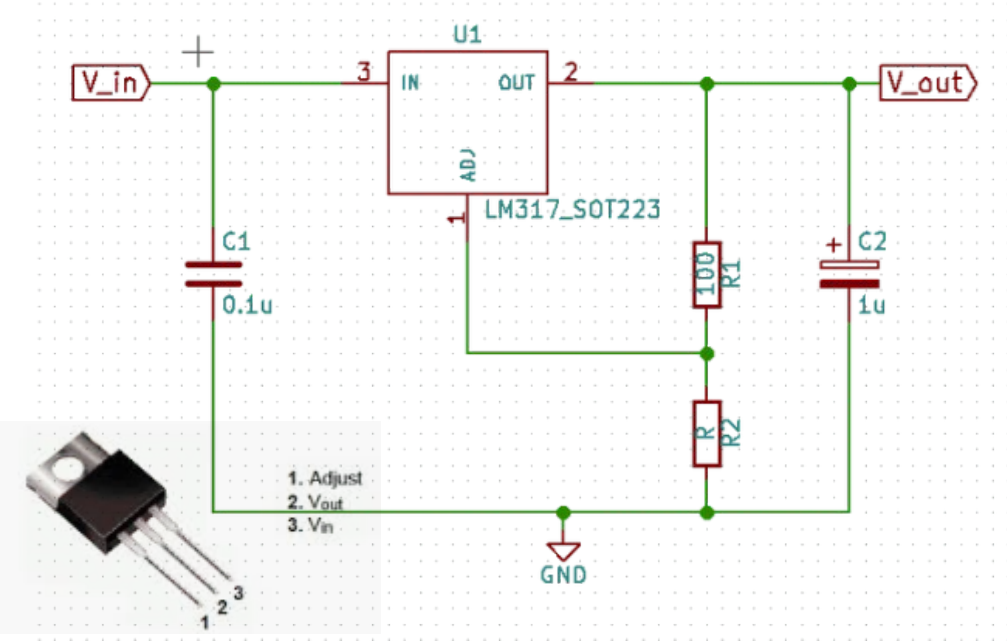
Written by Trevor Brown, G8CJS and Mike Stevens G7GTN

I have been working on the GVG hardware and made some changes. The first one was to free up my bench power supply and implement a plug top power supply. The panel requires two rails, 14V and 9V.

When powered up, before the software is running, all the lamps light and give a worst case drain of just under 1 amp on the 14V (and derived 9V) supply. I have LED panel lamps; they were in the panel when I acquired it and are DDP technology. They have same voltage consideration as the filament lamps but draw less current.

Once the software is up and running, we get into a mode where the lamps respond to the software this reduces the number that are illuminated at any one-time. Engineering for the worst case I went through my box of wall-warts and discarded all the ones which are designed as constant current supplies used for charging battery devices.

That left me with two that would deliver a DC output of more than 1 amp. One was 12V max, but upon opening it up (do you not just hate security screws), it has a linear switchable configuration that maxed out at 12V even though the transformer delivered 16V AC and this resulted in 19V when rectified and smoothed. It had a single regulator (LM317) and a switched resistor network. If you have never used one of these regulators, the output voltage is set by a potential divider. I removed the switch and hardwired it to the 12V position and shunted the top resistor in the divider to provide 15V. This worked well if I used a 1n4001 diode in the supply to the GVG panel as it dropped down to 14.3V.



The LM 317 Regulator configuration

That is near enough. I also found another one that was 15V so now I have a spare and they both are good for around 1.5 amps.

Until now the 9V was derived from the 15V by two cascaded 5V regulators that does not always function. One of the regulators has started to require a manual kick start to get 10V. I won't go into details, but it's ok on the desk while I am developing software, but when it gets boxed up (one of my long term aims) this will not do.

I found an LM 317 in my junk box and used it to derive the 9V from the 14.3V supply. It required a heat sync and I salvaged one from an old DV recorder.

Alas my junk box did not have an isolating kit, so I bolted the regulator directly to the heat sync and settled for the heat sync being at 14.3V and mounted with epoxy resin, it was isolated.

My junk box is now getting very depleted (I do miss Maplin's) so the potential divider is made up of four resistors, two in parallel both 4k7 for R2 and two in series for R1 both 180 ohms. Needs some tidying up.

It now has driven the panel for several hours and although things get warm, they are all touchable with no burnt skin and will survive in a box.

The Arduino came off the prototype board and is mounted on the dongle PCB with three wires connection GND SCL and SDA the power is supplied by the USB.

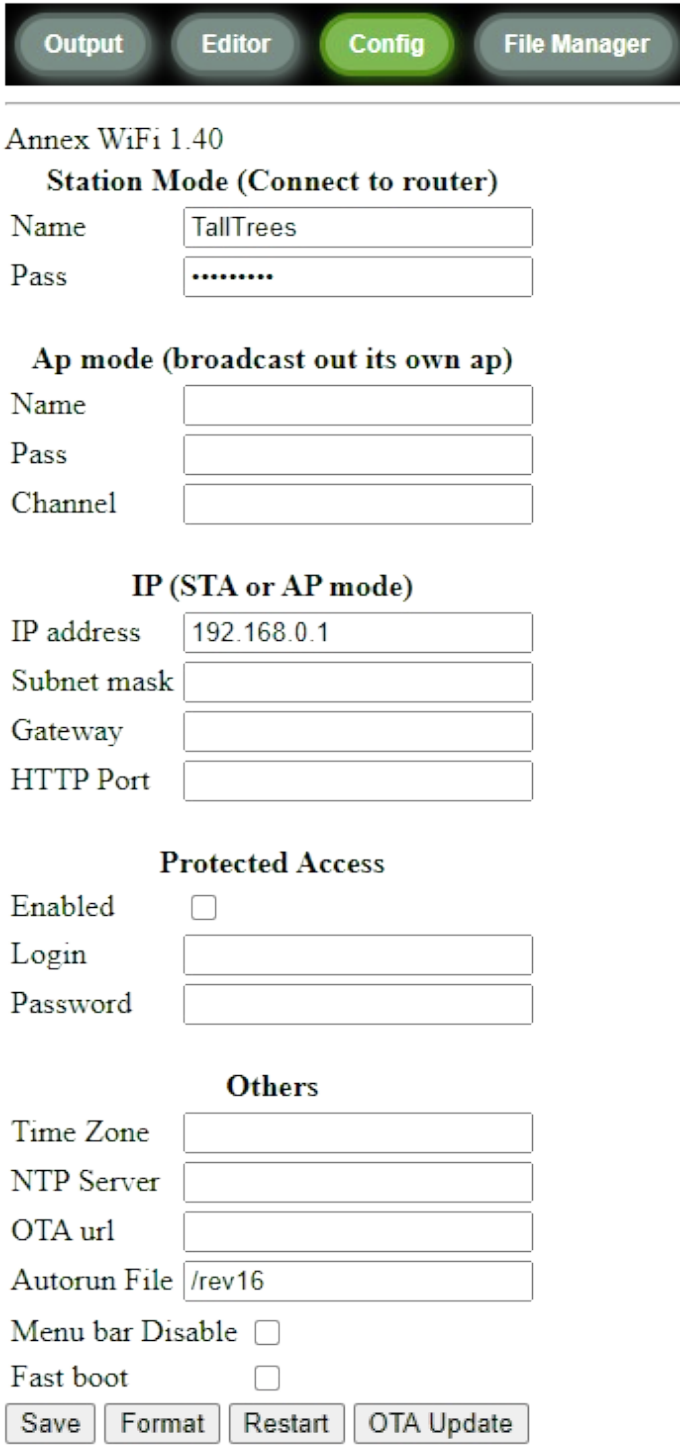
The ESP micro until now has always been powered by the USB and is started by summoning up the Annex editor and selecting save and run using the file GVG16. (GVG16 is not released yet, still working on it, more later).

The ultimate configuration will be to not have a USB connection and for it to self-start and run without the editor. The first problem was no USB and no power, so I connected Pin 15 of the ESP module to the GVG +5 volts that is supplying the PCF 8574 chips via a 1n4001 diode so it has power when you remove the USB lead.

Self-starting was relatively simple once I had RTFM'ed it (read the manual) - select config from the Annex editor, select config, enter the file you would like it to run on boot up in the Autorun /rev16 (works for GVG 15 too) and save.

Remove the USB lead to the ESP and dip the power. After a couple of agonising seconds all the lamps lit, then the display announces the software revision and the panel lamps go to their default start up and all functions. Coffee time really pleased with all my efforts. Should I need to work on programming the ESP BASIC, plug in the USB lead start the Annex editor revise, edit, save, and run the programme. Coffee tasted good.

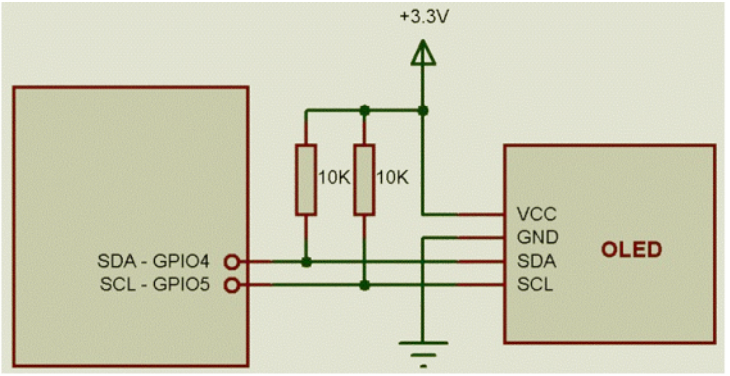
Annex Configuration menu



The next suggestion came from Mike G7GTN and it was to remove the LCD display and go OLED with a small display that should fit behind the GVG panel display window in place of the 7 segments that are redundant with Vmix. They set the DVE and Mix transition durations in frames. Vmix does not work this way. This is still reversible should I ever want to reconnect the panel with the original crate as the 7 segments are socketed. Vmix (even the free version) is so good it is never going to happen. I ordered a display (link at the end) it was under £5 including P&P and came in about 2 weeks.

OLED Display module

I expected to map its address with the I2C address finder and try pushing some code at it. As you will see from the display it does a lot more than just produce two line of text. This worried me in that I thought I might have to design custom fonts for it but Annex again rescued me in that all this is taken care of by the BASIC which supplies commands to drive the display.



In order to use the OLED, there are 2 steps :
- Initialise the I2C bus
- Init the display

This can be done with the following commands :

```
I2C.SETUP 4, 5   ' set I2C port on pins 4 and 5
OLED.INIT orientation 'init with a given orientation (0 = normal, 1 = upside-down)
```

In case of the display SH1106, the command is
```
OLED.INIT orientation, 1 'init with a given orientation (0 = normal, 1 = upside-down)
```

After these 2 lines, there are several commands available :
`OLED.CLS, OLED.COLOR, OLED.FONT, OLED.PIXEL, OLED.LINE, OLED.RECT, OLED.CIRCLE, OLED.PRINT, OLED.IMAGE, OLED.REFRESH`

The current implementation of the OLED is based on a double buffering, this permit to draw in background on the screen while the current image is still shown. This technique permit to avoid flickering while drawing objects on the screen. The command `OLED.REFRESH fmt` permit to choose between an automatic refresh (`OLED.REFRESH 1`) or a manual refresh (`OLED.REFRESH 0`). By default the refresh is automatic.

When an automatic refresh is set, the image is immediately updated after each drawing command whereas, with the manual refresh, the image is refreshed only when an `OLED.REFRESH` command is executed.

The `OLED.COLOR col` defines the color to be used by the different drawing commands. As the display is monochrome, only the color 0 (black) and 1(white) can be defined; an additional color 2 (reverse) permit to draw object that reverse the existing color already present on the screen, useful to draw and clear the same object. By default the color is 1 (white).

The `OLED.IMAGE x, y, image$` permit to draw an image on the screen from a file. The file format must be XBM, a kind of 'C' source code. This format is not really popular but it is supported by the free tool Gimp.
The command `OLED.FONT font_num` permits to define the font to be used by the command `OLED.PRINT`.
There are 3 fonts available, ARIAL MT10, ARIAL MT16, ARIAL MT24.

Example:

```
I2C.SETUP 4, 5 ' set I2C port on pins 4 and 5
OLED.INIT 1 ' init the OLED upside-down
OLED.CLS ' clear the screen
OLED.FONT 2
OLED.COLOR 1
OLED.PRINT 10,10, "HELLO WORLD"
```

F2 in the ANNEX editor brings up the online help, select OLEDS and that is the extract

Enter this into the revised software in place of the old LCD start up. This is the code I am currently using and the result is two lines of small, but smart OLED text.

I did not even have to figure out it's I2C address. Sometimes things you think are going to give you problems don't, we all know the reverse so often applies.

I can also turn the display upside down in software, so it supplies flexibility when it comes to mounting it. The INIT command supplies this choice.

```
OLED.INIT 1 ' init the OLED upside-down
OLED.CLS ' clear the screen
OLED.FONT 3
OLED.COLOR 1
OLED.PRINT 0,1, "G8CJS V16 "
OLED.PRINT 0,30, "Software "
pause 200                    ' pause to display software version
```

The interesting command was: -
The OLED.IMAGE x, y, image$ permits drawing an image on the screen from a file. The file format must be XBM, a kind of 'C' source code. This format is supported by the free tool Gimp.

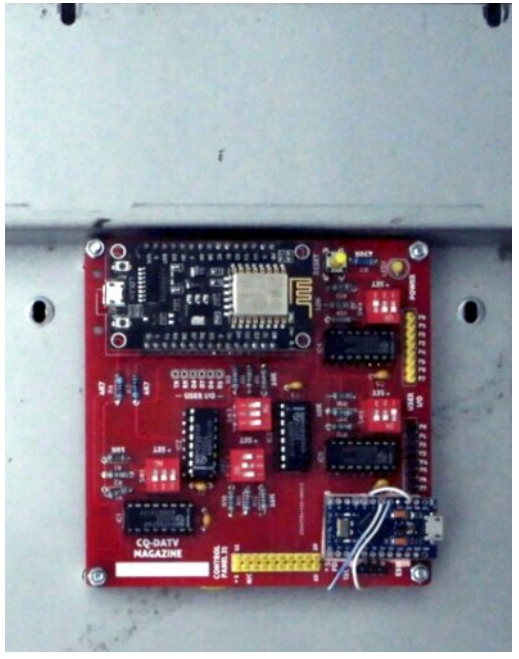
Now that sounds interesting, long time since I used GIMP but a CQ-DATV logo would be an improved startup screen. I keep making notes what to add to revision 16. Rev 15 is fully working and is available from CQ-DATV the download site and has LCD support, but not OLED support.

GVG window with OLED display fitted

The OLED display will mount behind the Duration display window. With 7 segments removed from their sockets the OLDED display will sit on top of the sockets and held in place by blue tac. I would have preferred bigger characters, but I can investigate that.

There are 3 pre-set sizes of fonts in the Annex BASIC and I am using the largest, MT 24 Aerial. I don't really need it to display the PST source as I am sat in front of a row of illuminated buttons that more than drives home which source I have selected and it also appears on the Vmix P/V monitor, but knowing which DVE is selected is useful as the panel selector buttons are marked with the old GVG wipes.
While I have the panel in bits, I also removed the steel base plate to explore if there is enough room to mount the GVG dongle.

Bottom plate of GVG showing the Dongle and Arduino mounted in a convenient space and GND SDA and SCL connected next to the GVG ribbon socket and the I/O ports available should we require them for tally lights



Ok a little drilling but the good news is my PCB fits in the bottom of the GVG panel and works making a very smart compact unit. I may yet rotate it and cut a hole for access to the USB on the ESP micro. The PCB was an immense help in this project. Previously I was working with everything mounted on two small prototyping boards. This was less than ideal, but did enable me to develop the software, with frequent malfunctions. Most of the malfunctions were traced to poor connections in the Heath Robinson construction of the hardware. Alas all this preceded the PCB arrangement.

Somehow problems always seemed to occur at the same time as code changes were implemented, making me think I had messed up the code.

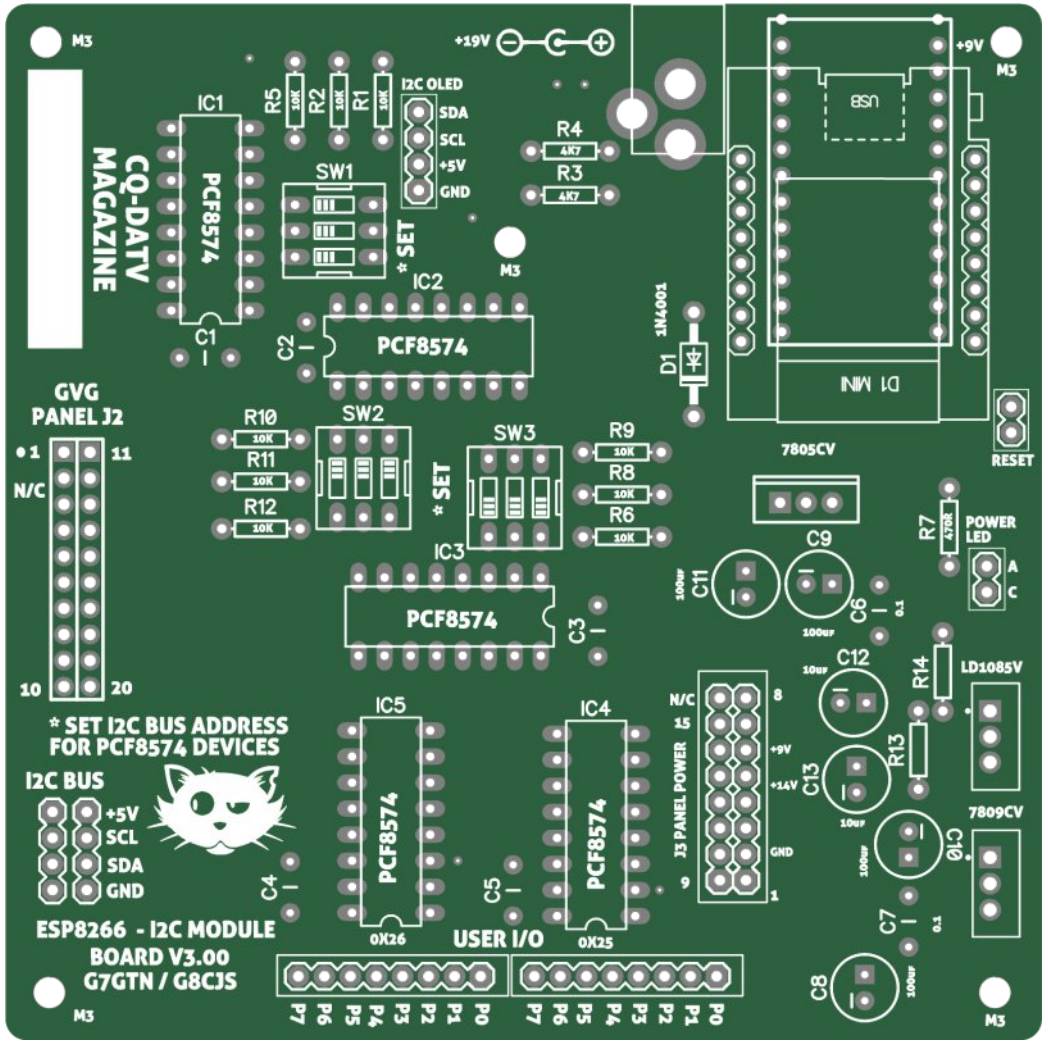
The PCB in the picture was developed before the addition of the Arduino micro which handles communications with Vmix. There are only four PCB's in existence (I have 2 of them). Mike G7GTN is the PCB designer and he has been updating the PCB to produce something where the Arduino is not held in place by the wires and a sticky pad. Mike is currently working through a list of PCB revisions, the major one is mounting the Arduino to handle Vmix MIDI communications.

If you are interested in building this project, we are considering ordering a one-off batch of PCB's.

The design currently on the drawing board will include the power regulator so the panel can be fed from a single rail e.g. 14 volts and cope with filament or LED lamps.

I am at this point unsure what other support would be needed to complete this project, it is down to your level of building and coding it might be possible to pre code some micros or even supply kits or populated boards. We would need a commitment of around a minimum of 25 orders to fund a PCB run. If you are interested, you can contact me via *editor@cq-datv.mobi*.

GVG Panels do turn up on the surplus market. There was recently one listed on e-Bay in Bulgaria (I put the link on the CQ-DATV Facebook) there was an additional cost of £30 P&P on top of the e-Bay auction price and there are currently two for sale in the States. These panels are not extinct despite their age and more may turn up in the future, so if you want to have a go ordering a PCB now might be a wise move. The code is open source and you can download GVG 15 from the website and GVG 16 with OLED support will be there in the next few weeks.



The final interface PCB, subject to testing. The two main regulators are on the edge of the PCB so they can be bolted down to the GVG base plate and use it as heat sync, should it prove necessary (Isolation kits will be required)

I have to say that sat in front of the modified panel, pressing the buttons, and seeing Vmix respond really gives me a buzz. There has been a lot of challenging work and the code will evolve further, with improvements, and revisions.

The documentation is long, it was written as the project evolved, I would like to see more panels up and running amongst our readers. This is what producing CQ-DATV is all about.
This interface could be built on strip board or Vero-board, we have published all the details and all the required magazines are in the CQ-DATV download library.

Building the interface without a PCB would add another level of difficulty that I am sure we can all do without and is why we have strived to supply PCB support.

Micro projects present an added level of difficulty and can be problematic to trouble shoot and if you add hardware errors, can be just a step too far. We need 25 interested readers to warrant the design, construction, and manufacturing of a batch run of PCB's, it is up to you, is this something you would like to take on board?

We have spent a lot of time and effort on the concept, with PCB support the construction is down to a few hours and the installation even less. If I add up Mike's and my own time on this project its considerably more.

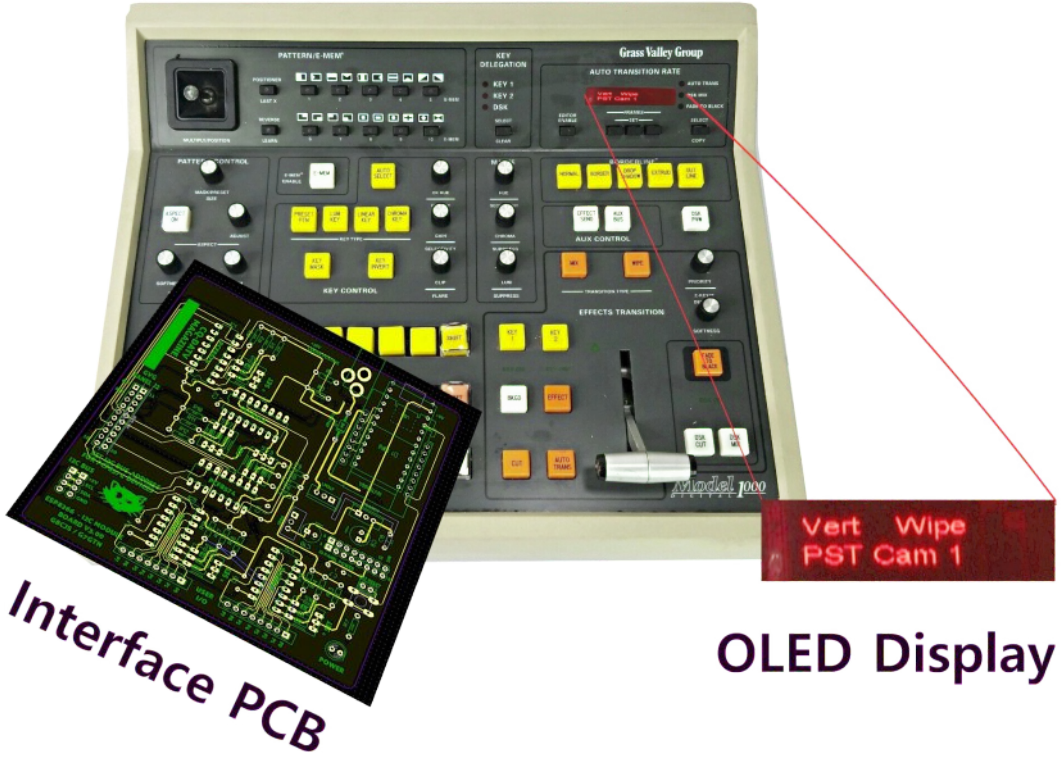
I would like to add some more bells and whistles but I am limited because some of the features I would like to add have already been restricted in the free issue of Vmix, so if implemented it would not be possible to verify they have been interfaced correctly.

If there is a reader with a full Vmix and an interfaced GVG panel, please get in touch - you could be the guinea pig for some added features. I am happy to code them just unable to verify the code works.

I have not forgotten the T-bar and I will revisit it once we get the new PCB up and running.

OLED Display
https://tinyurl.com/y5hd82cn

ANNEX help
https://tinyurl.com/y4a6vqr8



VK3RTV 2020 - Melbourne Australia July 2020

Written by Peter Cossins VK3BFG

The Victorian Education Department site at Olinda was decommissioned and the tower disassembled in January 2018. VK3RTV had been operational continuously from there for 40 years. After an extensive search, no site could be located on Mount Dandenong that did not incur a significant annual cost.

All antennas and rack equipment was therefore removed and transported for storage in my garage and garden shed.
In mid-June 2018, a week long test was made from Telstra's historic site at Surrey Hills, a high point in the eastern metropolitan suburbs of Melbourne. Most of the equipment there had been long decommissioned and co-axial cables and rack space was available.

As there was a need for an omni-directional service, it was decided to switch to vertical polarisation for the output and use one of the dipole arrays salvaged from the Olinda site. Three small panels horizontally polarised were used for a single 1255 MHz DVB-S input.

Interference problems with co-sited equipment were identified during a first test and a two level approach was taken to solve the problem. The centre frequency for the down link originally was 446.5 MHz, based on the Wireless Institute of Australia Band Plan frequency for the old analogue channel. This placed the sound carrier at 449.5 MHz, a quite satisfactory arrangement for that technology with a band edge at 450 MHz. The centre of the old analogue band was therefore 446.5 MHz and this was adopted for DVB-T. This meant that a perfect 7 MHz DVB-T signal would terminate at the band edge 3.5 MHz higher at 450 MHz.

Fig 1 Surrey Hills Single Channel Test Rack (Note the hole in the monitor display!

Due to non–linearities in the power amplifier stages, intermodulation products always result in a spread of spectrum well outside of band edge and these were at objectionable levels given the proximity of adjacent services. The first component of the solution was to create a guard band by moving the centre frequency down to 445.5MHz. This then leaves 1 MHz between 449 and 450 MHz which can be allocated to point to point repeater links which were originally located in the lower section of the new ATV band. This arrangement has been accepted and is now a part of the Wireless Institute of Australia Band Plan for 23 cm.
The second component was to source a commercial DVB-T filter. This was problematic as the amateur bands are usually not catered for by commercial companies in this area. Comm Tech in Italy was found by Phil Gardner VK3GMZ who was prepared to re-tune one of their filters to the required centre frequency. I suspect there were sympathetic Engineers who viewed it as a challenge to their design.

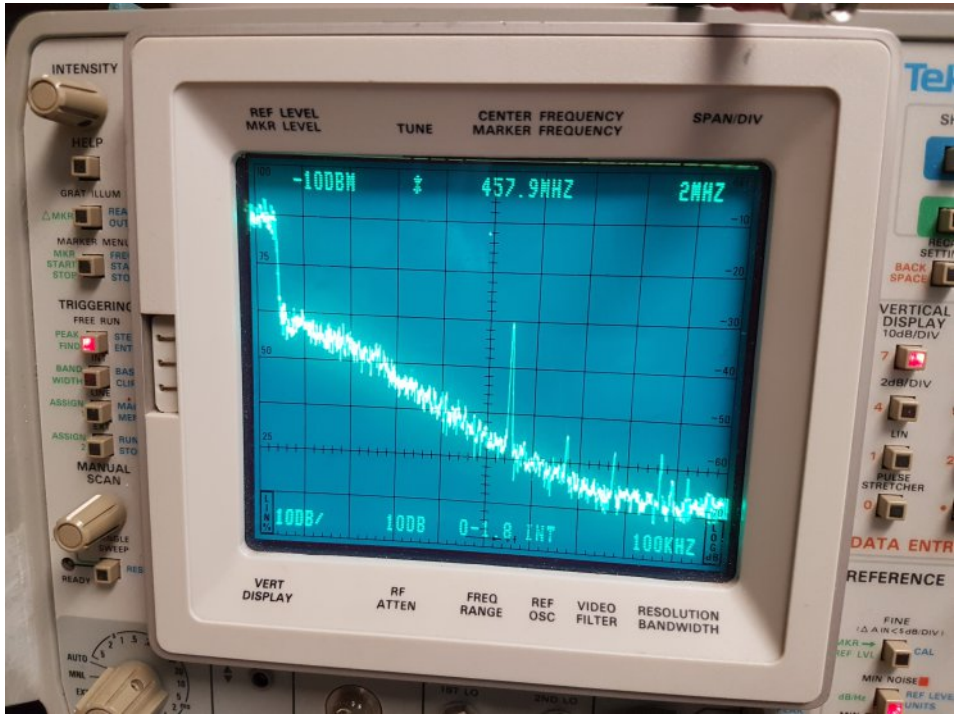


Fig 2 PA Spectrum Before Filter

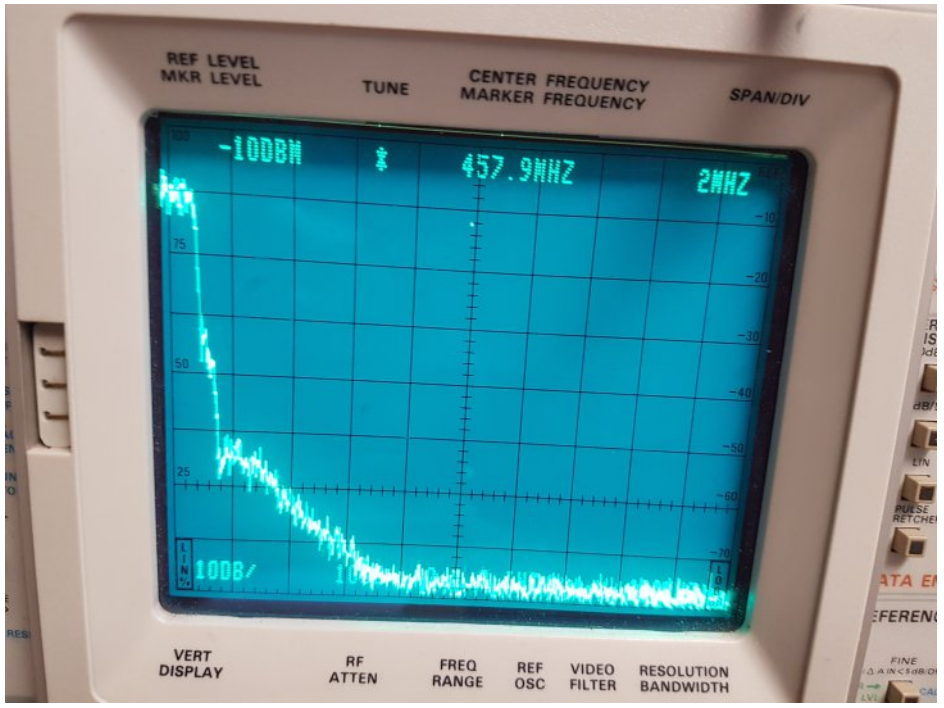


Fig 3 PA Spectrum With Filter

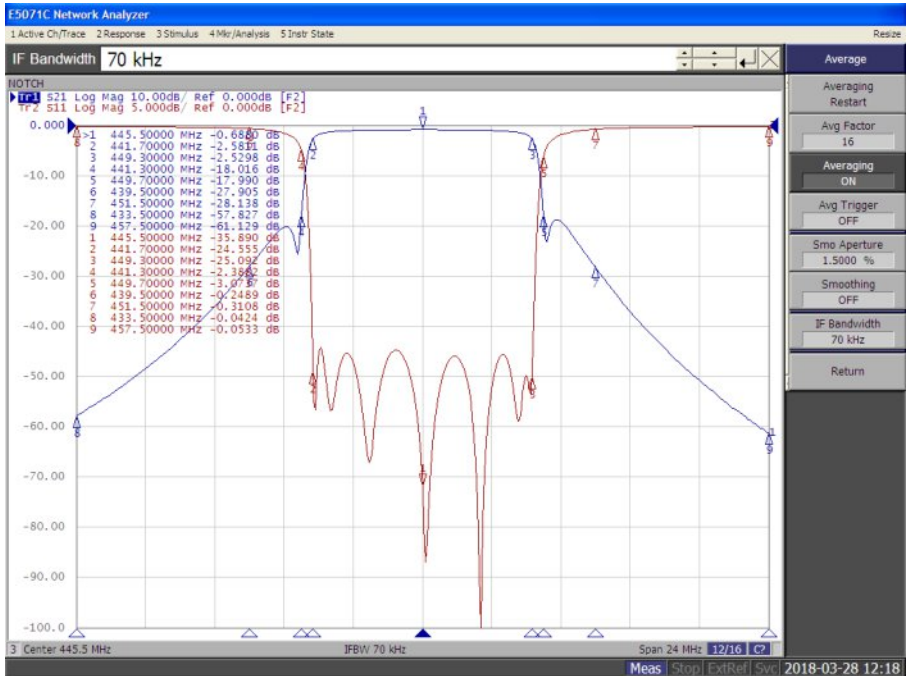


Fig 4 Filter Specification

Fig 5 Filter on Test

The cost of the filter was shared by the Eastern and Mountain Districts Radio Club and Amateur Radio Victoria.. Subsequent testing revealed a positive result with no interference to adjacent services. The test at Surrey Hills also provided data on coverage from a good metropolitan site and also receive pre-amplifier requirements.

Amateur Radio Victoria had recently acquired the lease on a site at Mount View in the eastern metropolitan area and prime tower locations and cables would be available for VK3RTV. The site is high security and requires that all O.H and S rules be strictly observed.

To maximise receive coverage. It was decided to install three antennas on three separate cables. These antennas were to be dual quads sealed in switchboard boxes.

The frequencies selected were 1278 MHz, 291^{o} magnetic, 1255 MHz, 020^{o} magnetic and 1246 MHz, 140^{o} magnetic providing optimum input coverage.

A number of field experimental measurements were made in developing the antenna these being, bandwidth and beam-width and gain referenced to a dipole.

John VK3ATV, one of the Melbourne ATV Group, organised the services of Ian Curry who offered to install the antennas.

Fig 6 Panel Front View

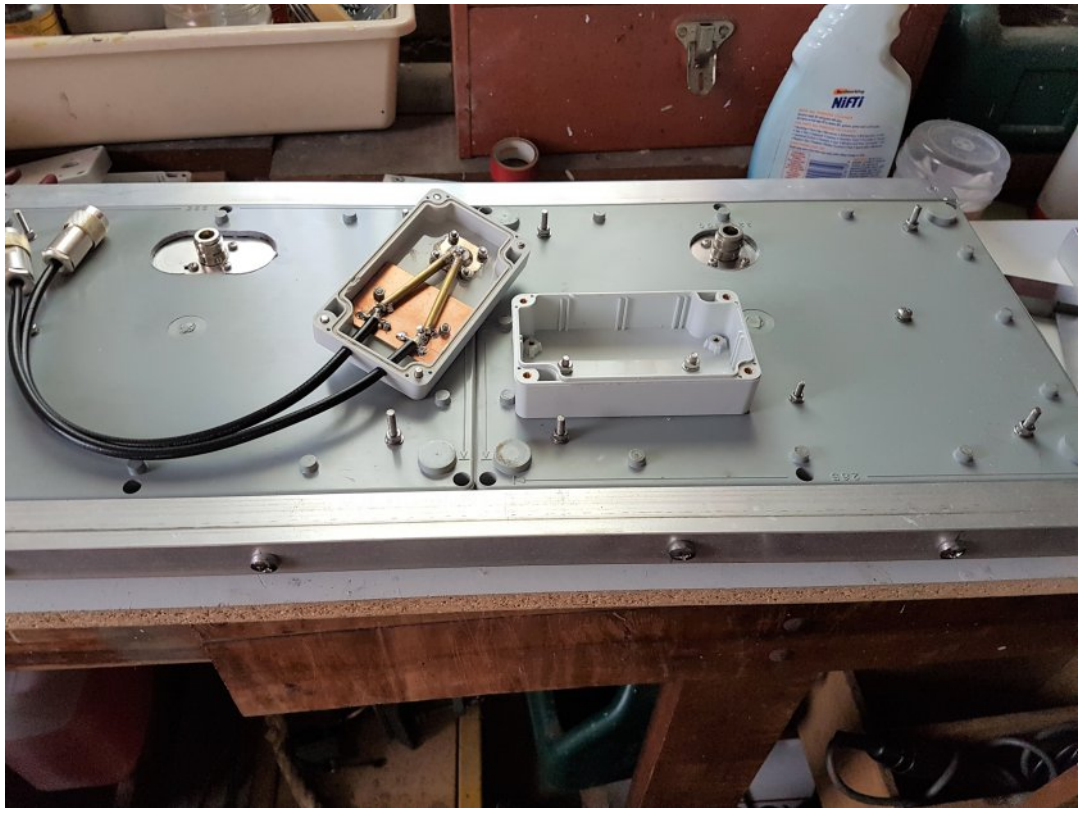


Fig 7 Panel Matching

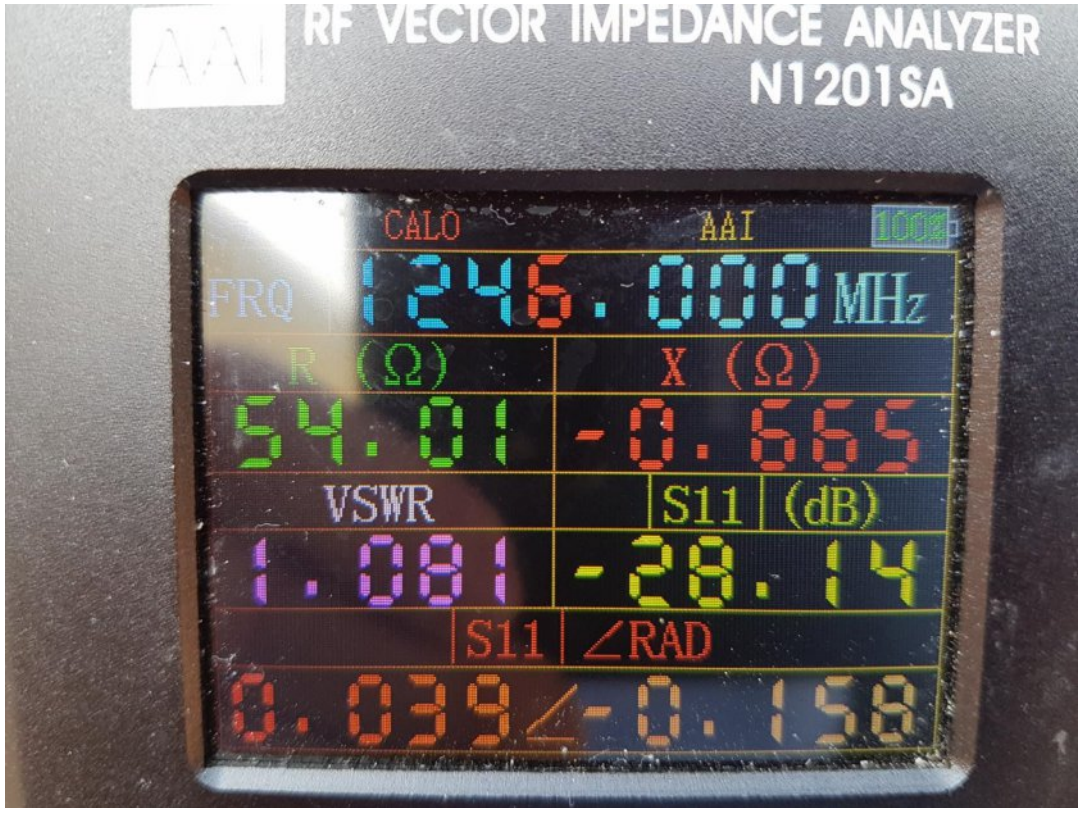


Fig 8 Performance and Outlook

Ian is a fully licenced professional Rigger and provided his services free of charge. Ian worked all day up the tower organising and testing and re-routing cables and installing the three panels. This was a significant contribution in practical and financial terms to the project.

The Melbourne ATV Group and WANSARC, a western suburbs radio club funded the purchase and installation of a binary array to serve as the 445.5 MHz DVB-T output.
The transmit exciter provides a multiplexed DVB-T signal on a centre frequency of 445.5 MHz DVB-T, QPSK modulation. The two channels are designated VK3RTV1 and VK3RTV2.
VK3RTV1 is served by two inputs, CHA is a Remote Access function which can be used for access for special visitors or remote 23 cm DVB-S nodes and CHB 1255 MHz DVB-S.

VK3RTV2 CHA is 1246 MHz DVB-S and CHB 1278 MHz DVB-S. These inputs are on a first in best dressed option. Users are urged to monitor 147.4 MHz FM as the 2 metre liaison frequency.

There are various DTMF functions including 0 VU and Colour Bar for both right and left hand audio channels and the ability to bring up the internal satellite receiver signal report.

From the top of the rack there are two Raspberry Pi's serving as the streamers to the BATC and also the Remote Input function. Then three Humax 5400 Satellite Receivers with remote IR control and a Minikits 23cm Pre-amplifier coupled to Band Pass Filters in each case. (Replacement by more modern DVB-S/S2 receivers is being planned.)

Fig 9 1246 MHz Panel

Fig 10 Mount View Tower

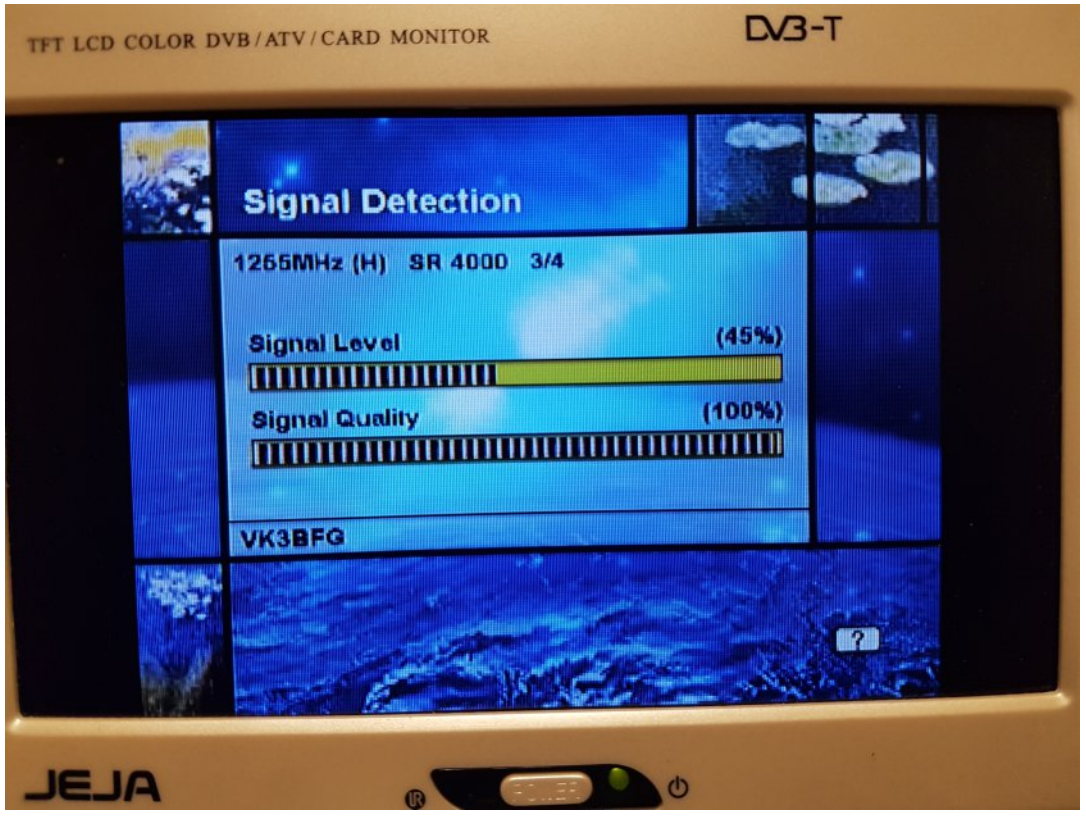


Fig 11 DTMF Code Request Signal Report

Below that are the VK3RTV1 and VK3RTV2 local monitors, VK3RTV1 Controller, Remote IR controlled Media Box, VK3RTV2 Controller, Multiplexed DVB-T Exciter, PA Controller, 500 watt PA (running light), PA Tangential Fans, 12V and 50V Power Supplies.

A significant proportion of the equipment in the rack is either totally home brew, assembled from kits or partial kits and in the case of the DVB-T Exciter, PCB's mounted into a case with power supply and protection circuits.

The tangential fans were sourced from disposed telecom equipment, re-mounted with a speed controller to reduce the hurricane level air supply they normally produce.

Fig 12 Rack

To date, the performance has been beyond expectations with most stations being able to see and access the system. Reports from viewers reinforce this.
Stations seen so far include VK3XKA, VK3BCU, VK3GE, VK3WWW, VK3KQ, VK3CH, VK3BFG, VK3ATV, VK3WV, VK3ZSJ and VK3GMZ. The most notable stations were Simon VK3ZSJ at 37.2 Km, Geoff VK3GE at 60.9Km, and Phil VK3GMZ at 33.5Km.

The most notable of the 'notables' was Phil, VK3GMZ on 25 July 2020. Phil is about the same distance from Mount Dandenong as the Repeater site at Mount View. He has been able to access the Repeater a number of times when the weather is fine. This is most likely a case of knife edge diffraction.

Fig 13 Home-brew VK3RTV1 Controller

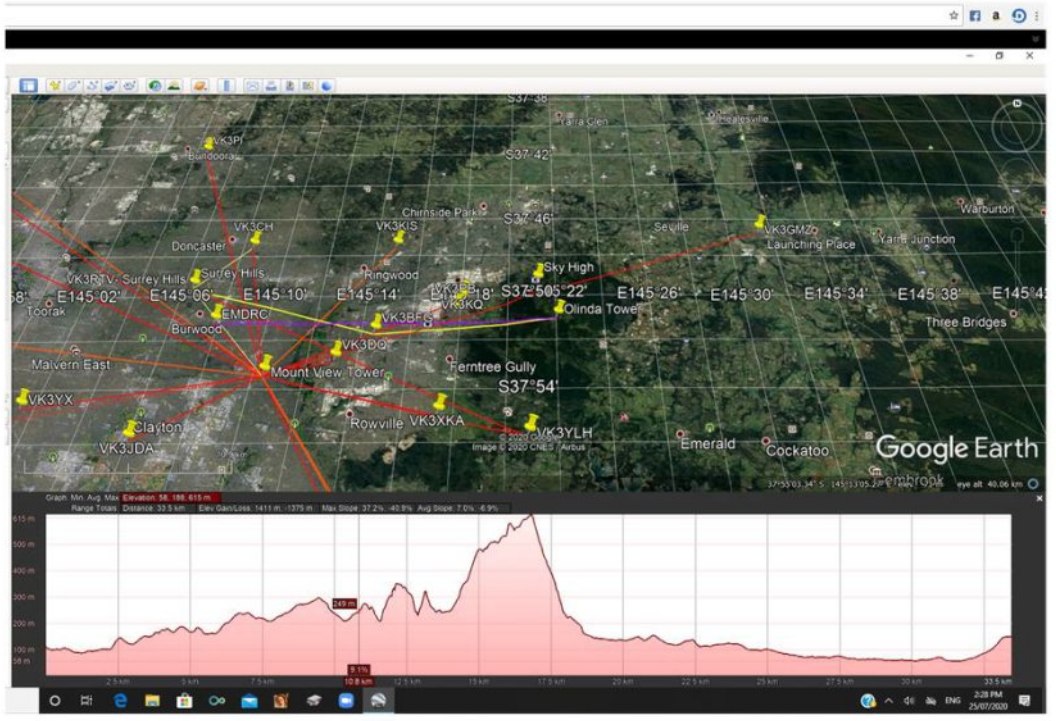


Fig 14 Path between VK3RTV and VK3GMZ

The new site has been professionally refurbished by Amateur Radio Victoria. The Tower has had a engineering inspection and with the lease arrangements that Amateur Radio Victoria has on the site, operations should now continue well into the future.

VK3RTV is again operational for the long haul and no doubt will exist in different forms as time goes by and as it has done in the past. At this time it is SD based on Composite Video and Stereo Audio. Possibilities for the future is a move to HD. As early adopters we use DVB-S for the uplinks and this is not likely to change in the near future as all current stations have an investment in this mode.

Fig 15 Phil's Son Lochlan TV Star

Fig 16 No Pixelation for Periods of Time

TV Amateur is a German Language ATV Magazine It is published 4 times a year and if you would like to subscribe go to *http://agaf-ev.org/*

Hi-Definition, Digital TV in Japan on 5, 10 & 24 GHz — 113 km!

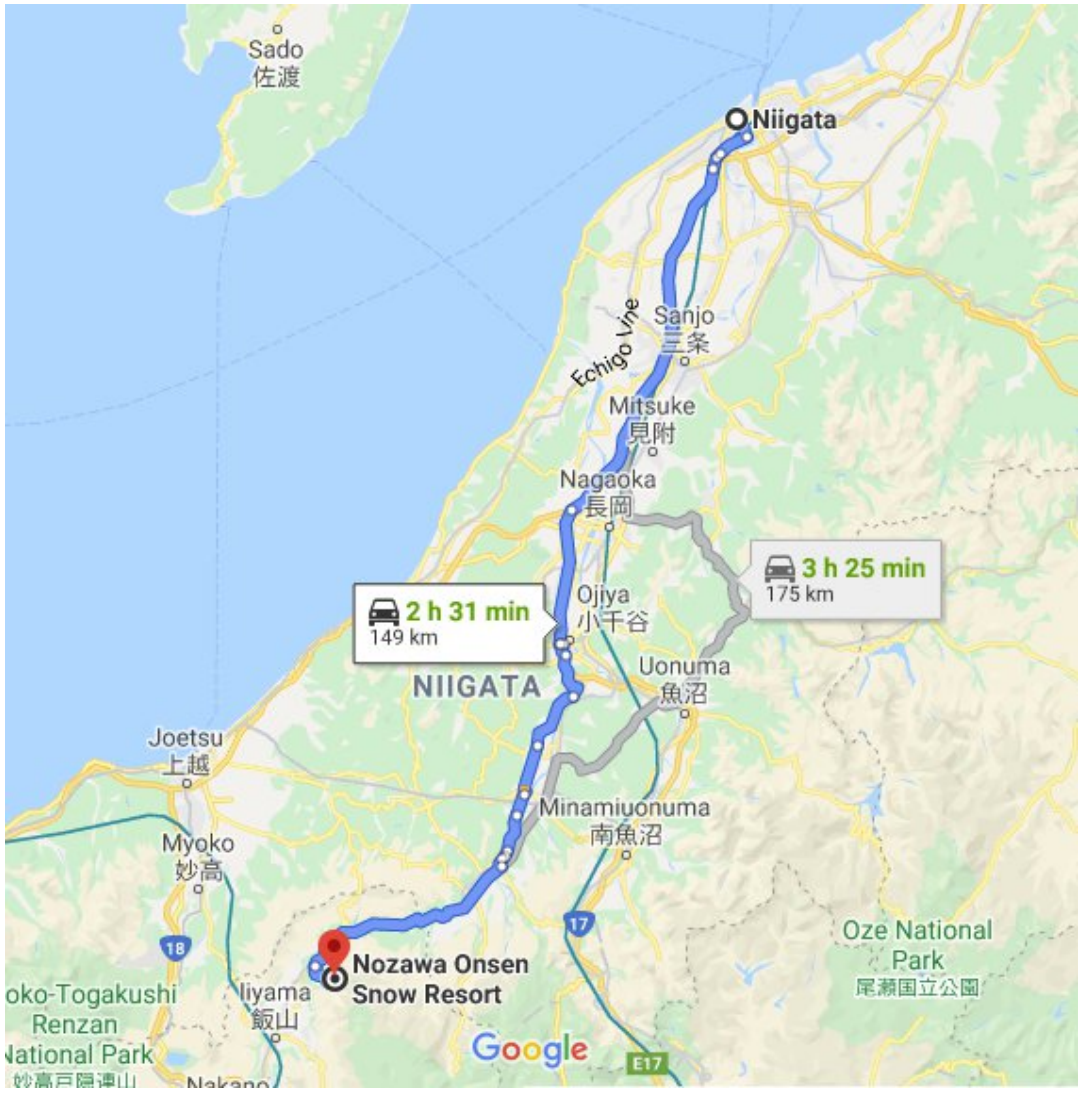
Written by Jim Andrews KH6HTV

We have just received a report from Fumio, JA0RUZ, of more impressive microwave DATV DX activity in Japan. They are using the Japanese digital broadcast standard ISDB-T which is closely related to DVB-T. On June 20th, they successfully transmitted ISDB-T pictures and audio on 5, 10 and 24 GHz over very long distances.

Fumio reports the following: "We have recently succeeded in ISDB-T full high-definition 3 band relay communication up to 24 GHz over a span of approximately 113 km, so we will report this.

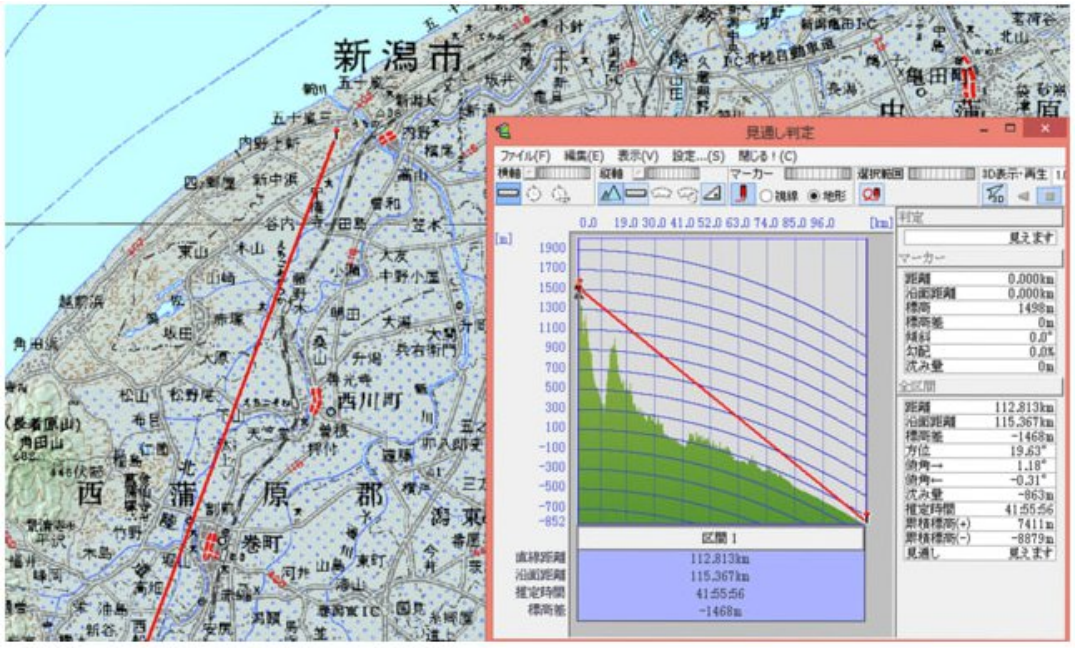
The configuration is as follows:-

- *JA0RUZ: 10GHz full high-definition transmission =>*
- *JA0RGP: 10GHz reception/recording =>*

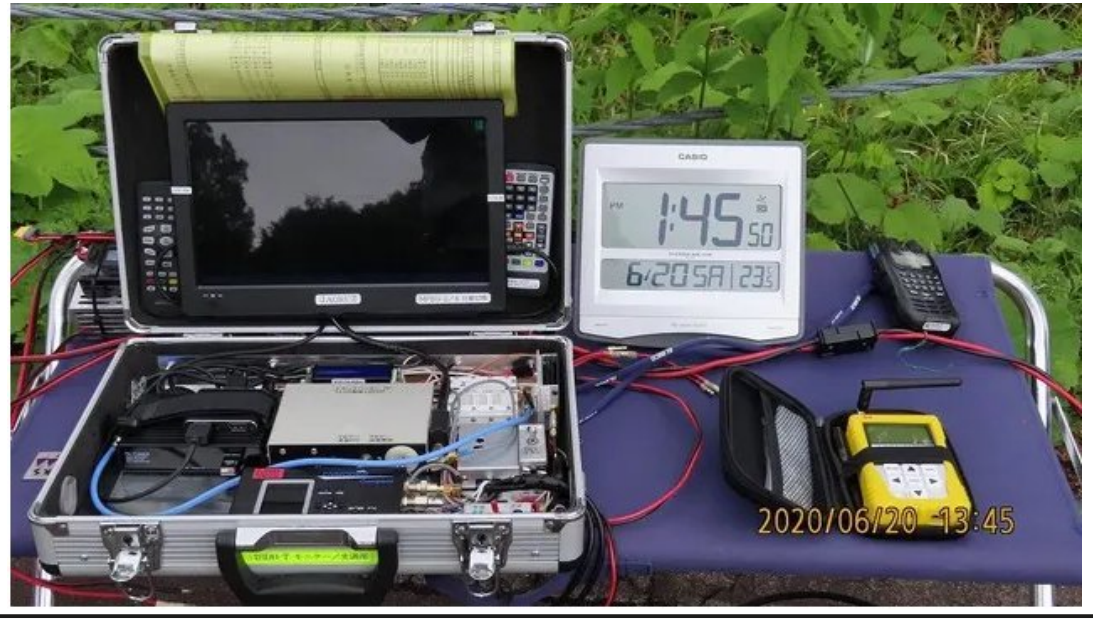


- *JA0RGP playback video transmitted at 24GHz =>*
- *JA0RUZ 24GHz reception =>*
- *Retransmission of that video at 5GHz =>*
- *JA0RGP 5GHz reception — "Retransmission successful!"*

"FHD-ATV was operated between Nozawa Onsen Ski Resort and Niigata City . "Mutual distance of about 113km".



It was sunny up to Nozawa Onsen Muranaka on the day, but it started to rain when I started climbing the Okushiga Forest Road for a while , and it seemed that I was on top of a rain cloud from an altitude of about 1200 m, and I could operate without problems until the end of the rain .This time, it is possible to receive almost stable FHD video from 5G to 24G, and it is thought that the effect of the antenna created by JA0RGP has appeared. It should be noted that the success of over 10km, +24G full high definition ATV 100km may set a world record .



Video that we sent in 10G was recorded by the JA0RGP station, and even if it was a round-trip video that was sent back in 24G, it was almost returned. There was no freeze."

The recorded video can be watched on You-Tube at the following link:

https://tinyurl.com/yac2q6x8

Fumio's blog web site also gives details of this and other microwave dx-peditions.

https://tinyurl.com/yare6wbs

NanoVNA Technical Evaluation

Written by Jim Andrews, KH6HTV
Reprinted from Boulder Amateur Television Club TV Repeater's REPEATER June, 2020

The May issue of QST included a product review of the NanoVNA Vector Network Analyzer. Based upon this review, I decided to purchase one. For the claimed capabilities of this device and it's extremely low price of approximately $50, for an instrument to test S21 & S11 from 50 kHz to 1.5 GHz, how could one go wrong?

Upon unpacking the NanoVNA and turning it on and running a few quick tests, I was impressed. I have made some careful evaluations. The following documents my various tests. All of my tests were for transmission, S21, (insertion loss in dB) and reflection S11, (return loss in dB) in the log Magnitude display mode

Calibration

For awhile, I had issues getting the VNA to maintain a proper calibration. One step in the calibration process is extremely vital and easy to overlook. After performing the complete Open, Short, Load, Isolation & Thru calibrations, one hits the Done button. But you are not really done at that point. You must first SAVE the calibration in one of five Calib files. Then recall the Calib file and run some tests on it to verify it is valid. Put the Short back on at the reference plane. The S11 plot must be a flat line at 0dB RL. Next connect the THRU connection again. The S21 plot must also be a flat line at 0dB IL. If there are any deviations from these flat 0dB lines, you have an invalid calibration. You need to repeat again your calibration process.

Calibration Standards

NanoVNAs use SMA connectors. Most NanoVNAs come with a pair of short RG-174/U coax cables and a set of Cal standards. They are all with SMA plugs (male) connectors. They are a Short circuit, Open Circuit and a 50 Ω termination (Load). Also included is a short SMA jack/jack (f / f) barrel adapter for connecting these and also for making the Thru connection. It should be noted that a short circuit is a much better cal standard than on open. On open is really not a true "open" circuit, because there is fringing capacitance from the end of a coax cable, and if not shielded radiation also. Thus for testing purposes, always use a Short.

I immediately discarded the RG-174 cables and replaced them with higher quality RG-316/U, SMA, 12" cables.

For evaluation purposes, I also then used some other calibration standards. I also had some precision Anritsu Open/Short calibration standards with K connectors. (note: K connectors are mechanically compatible with SMA, but have a higher frequency range extending to 40 GHz).

My other standards were a set of DC-18 GHz, SMA attenuators ranging from 1dB to 30dB. These all had extremely flat responses across the 1.5 GHz range of the NanoVNA. An obvious use of these attenuators was to check the S21, insertion loss calibration of the VNA. Another not so obvious use is to check the S11, return loss calibration.

To do this attach the attenuator to the reference plane test port, but do NOT connect the other end to the S21 (Ch1) test port. Instead screw the SMA Short onto the other end of the attenuator. Now as the incident rf signal passes thru the attenuator of Y dB loss, it will then strike the short circuit and be totally reflected back to the input, again passing thru the attenuator and again losing more power. The return loss will thus be 2 x YdB. For example, with a 3dB attenuator, in this setup, the measured S11 return loss must be 6 dB. With a shorted attenuator, the return loss plot should be a completely flat line, if the analyzer is properly calibrated.

I performed evaluation tests over 3 distinct frequency ranges using the SMA attenuators. 1. HF 1 to 30 MHz, 2. 70cm band and 3. the full range 10 MHz to 1.5 GHz. I obtained extremely good calibration results on the narrower HF and 70cm bands. There was more ripple on the full 1.5 GHz sweep, but it appeared to be OK up to 1.2 GHz. Beyond there I would deem the results to be questionable, using the full sweep. It would be OK, if one used a narrower sweep at the very high frequencies.

For my final acid test of the NanoVNA, I compared it's results to those obtained by much more expensive Network Analyzers. The first one was a Wiltron model 5447A Scalar Network Analyzer. It covers from 10 MHz to 20 GHz. This was an extremely expensive instrument. My company Picosecond Pulse Labs purchased it in the early 90s for $20,000. It had calibration traceable to NIST and was recalibrated every year while it was in service on the production line. (note: Wiltron was subsequently purchased by Anritsu).

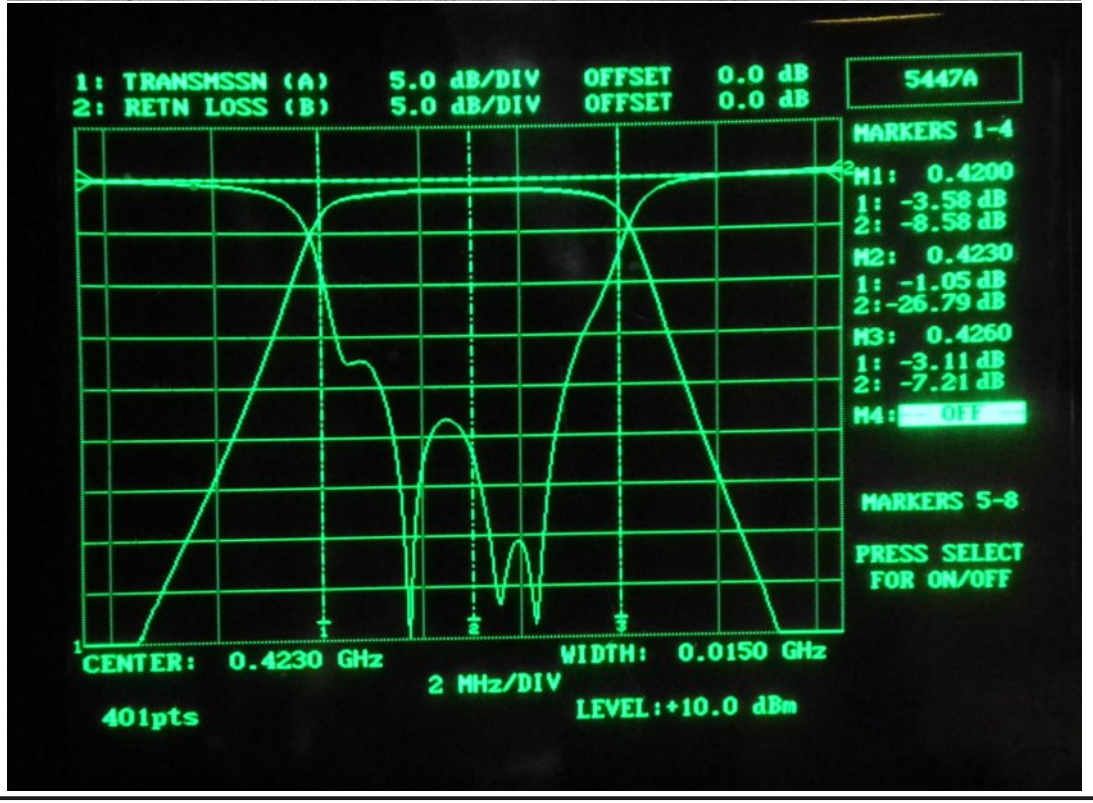
The second test instrument was a new Rigol model DSA-815 Spectrum Analyzer with a built-in tracking generator. It covers from 9kHz to 1.5 GHz and costs about $1,500. The Rigol makes S21, insertion loss / gain measurements directly using the tracking generator output passing through the device under test into the spectrum analyzer input. The S21 setup is calibrated by a Thru connection and then pushing the "Normalize" button. It is also possible to make S11, return loss measurements with the Rigol using a directional coupler on the output of the tracking generator. The coupled output from the coupler then goes to the spectrum analyzer input. The S11 setup is calibrated by attaching a short circuit at the reference plane at the end of the coax cable connected to the directional coupler, and then pushing the "Normalize" button.

The test object used to compare the various Network Analyzers was a KH6HTV VIDEO, 70cm, 6 MHz, Band-Pass Filter, model ATV-BPF-XXX.

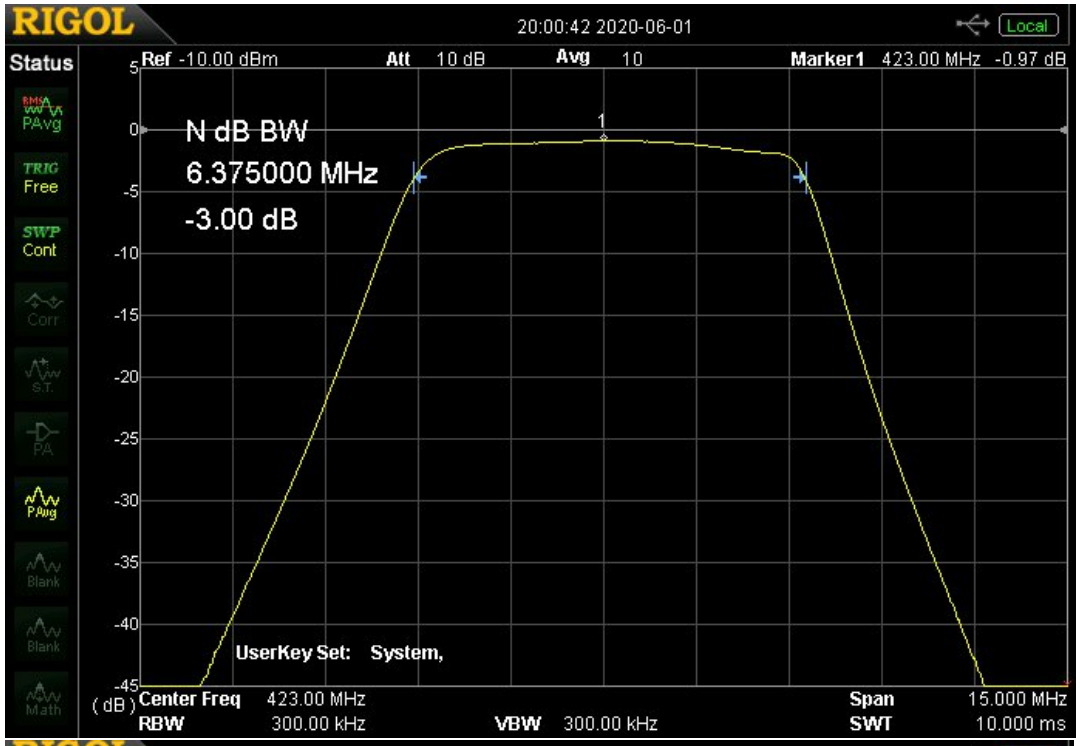
The BPF was first tuned to channel 57, 423 MHz, using the Wiltron 5447A. The first photo shows the results. It was then tested using the Rigol and finally the NanoVNA.

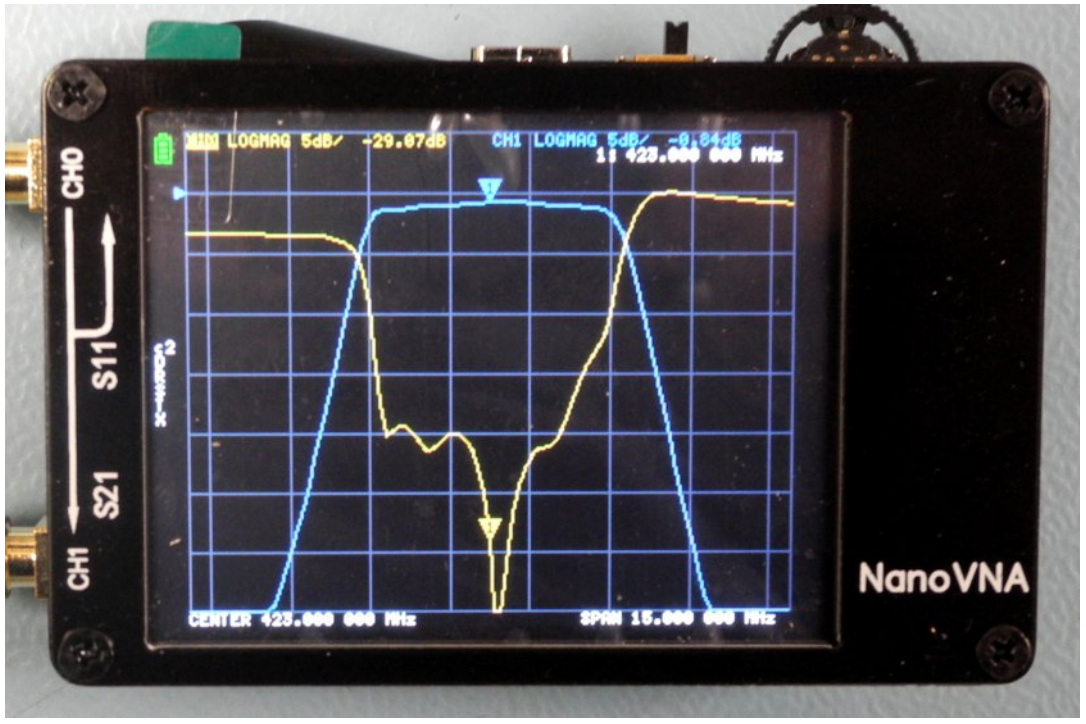
This table compares the results of the measurements made with each network analyzer

Network Analyzer	S21 (423 MHz)	-3dB Bandwidth	S11 (423 MHz)
Wiltron 5447A	-1.05 dB	6.2 MHz	-27 dB
Rigol DSA-815	-0.97 dB	6.375 MHz	-26 dB
NanoVNA	-1.08 dB	6.450 MHz	-29 dB



Right: Ch 57 Band-Pass Filter – measured with Wiltron model 5447A, 10MHz-20GHz, Scalar Network Analyzer.. S21 & S11 center frequency = 423 MHz, span = 15 MHz, 5dB/div markers are at 420, 423 & 426 MHz





Above: Ch 57 Band-Pass Filter – measured with NanoVNA Blue trace is S21 Yellow trace is S11 center frequency = 423 MHz, span = 15 MHz, vertical scale is 5dB/div. Note: the insertion loss was corrected by the initial calibration offset of 0.25dB. The S11 shown on the lower stop-band seems questionable, as it should be about 0dB rather than the indicated -4dB

Left: Ch 57 Band-Pass Filter – measured with Rigol DSA-815 1.5 GHz Spectrum Analyzer & tracking generator. S21 on top. S11 below center frequency = 423 MHz, span = 15 MHz, 5dB/div & 1.5 MHz/div

Note: The major drawback to the NanoVNA for tuning narrow band devices, such as this filter, is the relatively slow sweep time for the 100 point scan data acquisition and processing. It makes it difficult to make fine tuning adjustments.

Receiving DVB-T ATV Signals on a Raspberry Pi

Written by Bill Eberle AB0MY and Don Nelson N0YE
Reprinted from Boulder Amateur Television Club TV Repeater's REPEATER June, 2020

The Raspberry Pi OS (once called Raspian operating system) for the Raspberry Pi with applications included contains an application called VLC. VLC is a widely used video application on many platforms from PCs, tablets, and smart phones to the Raspberry Pi. The functioning and personality of VLC, from my observation, are identical to how it functions on PCs.

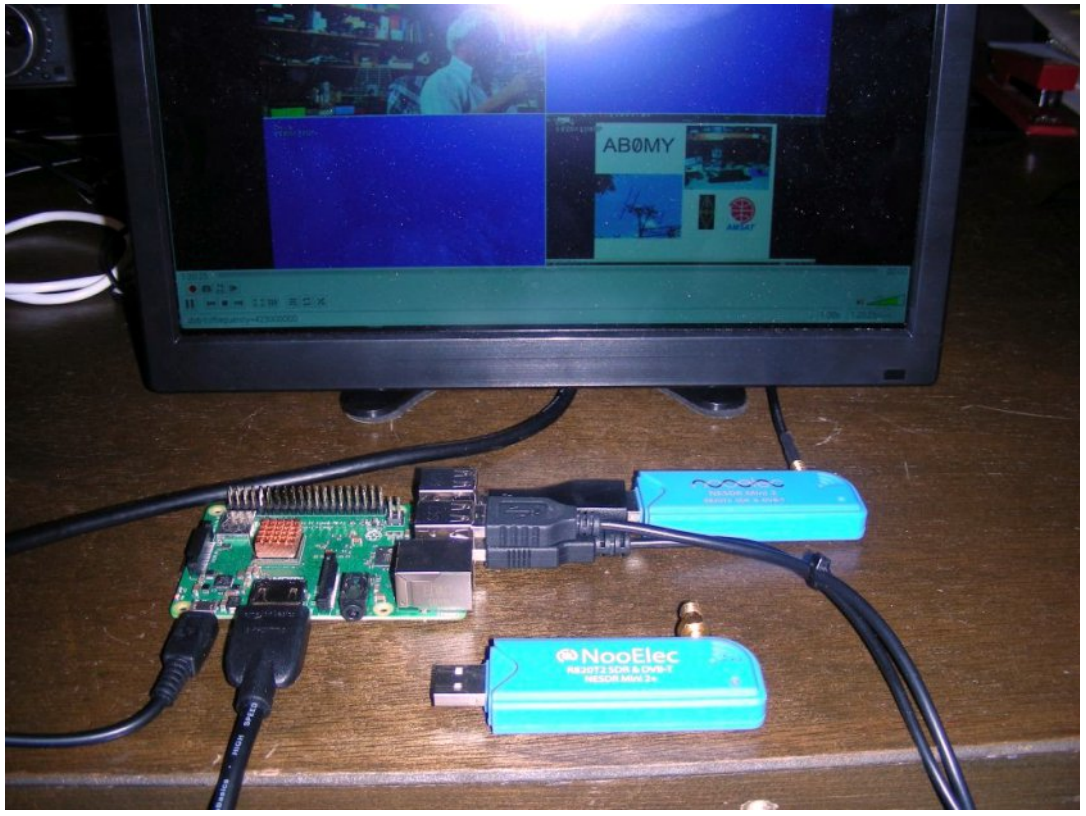
When a software-defined radio (SDR) dongle, with a USB plug, is plugged into a Raspberry Pi (RPi), the RPi software automatically recognizes the presence of the dongle, and the VLC application will allow the user to tell the dongle to receive DVB-T signals on a given frequency and with a given bandwidth. VLC documentation will give the user the details of how to make the software work.

The VLC application has been demonstrated to work with both a Raspberry Pi 2 running the Raspian operating system and a Raspberry Pi 3 running the Raspian operating system. It also has been verified for a Raspberry Pi 4.

Some notes:

1) The USB connectors on the RPi are close packed, so an extender of some sort is needed to connect the SDR device to the RPi.

2) VLC uses the operating system's built-in support for the RTL-SDR chips, and as such the maximum frequency is limited to around 860 MHz by the Linux drivers. (If you have used one of these devices at higher frequencies [they will



Live 70cm, DVB-T video image being received with RPi-3 using a Nooelec model NESDR Mini 2 SDR (spare in foreground.)

function up to around 1700 MHz] with some SDR package, you were able to do that because your SDR software uses its own set of drivers.) If you want to use VLC at higher frequencies, there is a workaround for this described by Clayton Smith, VE3IRR, at the following link (described near the bottom of his page):
https://irrational.net/2014/03/02/digital-atv/

He also describes using the "BladeRF" for transmitting digital ATV.

3) The following link is the best way to get the Raspberry Pi OS: *https://www.raspberrypi.org/downloads/*

4) Method

- Once you have your RPi up and running and your SDR dongle connected, start the VLC (it is under "sound and video").

- *Select: Media > Open capture device.*
- *Select tab Capture Device.*
- *Select Capture Mode (drop down) TV-digital.*
- *Select DVB-T.*
- *Enter frequency and use the bandwidth drop down and select 6 MHz. (The default "automatic" sometimes hasn't worked for me.)*

5) Links for the Nooelec SDRs:

https://tinyurl.com/y27gxtqx

https://tinyurl.com/oc6z2hv

6) Reply to my email to VE3IRR requesting permission to reference his work: "You're certainly welcome to quote or paraphrase that part, or use whatever else you like from my blog. 73, Clayton (VE3IRR)"

This is your free ATV magazine.
Please consider contributing an article!

Grandma

One evening a grandson was talking to his grandmother about current events. The grandson asked his grandmother what she thought about the shootings at schools, the computer age, and just things in general.

The Grandmother replied, "Well, let me think a minute, I was born before television, penicillin, polioshots, frozenfoods, Xerox, contactlenses, Frisbees and the pill. There were no credit cards, laser beams or ball-point pens.

Man had not yet invented pantyhose, air conditioners, dishwashers, clothes dryers, clothes were hung out to dry in the fresh air and man hadn't yet walked on the moon.

Your Grandfather and I got married first, and then lived together. Every family had a father and a mother.

Until I was 25, I called every man older than me, "Sir."And after I turned 25, I still called policemen and every man with a title, "Sir."

We were before gay-rights, computer-dating, dual careers, daycare centers, and group therapy.

Our lives were governed by the Ten Commandments, good judgment, and common sense.

We were taught to know the difference between right and wrong and to stand up and take responsibility for our actions.

We thought fast food was what people ate during Lent.

Having a meaningful relationship meant getting along with your cousins. Draft dodgers were those who closed front doors as the evening breeze started. **Continued page 34...**

Linear Class A, CATV Trunk Amplifiers for 70 cm Driver Amps

Written by Jim Andrews, KH6HTV

Reprinted from Boulder Amateur Television Club TV Repeater's REPEATER July, 2020

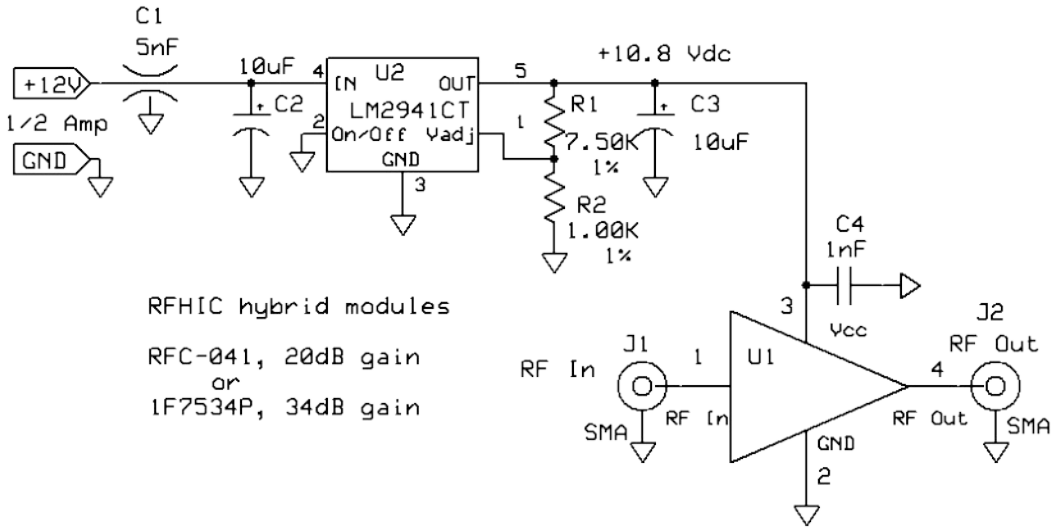
Recently while looking though my electronic parts cabinet, I stumbled on some CATV amplifiers I had purchased ten years ago. I used one of them (RFC-041) in my very first 10 watt (pep), VUSB-TV transmitter. I called it my model 70-1. (see the next article) The parts were hybrid modules from RFHIC in Korea. They were the RFC-041 and the 1F7534P.

Unfortunately, they are no longer available from RFHIC. However, the concept of using CATV trunk amplifiers as very linear drivers should be kept in mind when designing your next 70cm or 33cm, ATV transmitter. Thus, I am showing you what can be accomplished with them.

The RFHIC specs. for these amplifiers were: 12Vdc at 1/2 Amp, Gain 19dB (RFC-041) & 34dB (1F7534P). The 1F7534P was specified for CATV service from 50 to 750 MHz with outputs of 44dBmV. The RFC-041 was specified for mobile data radio service in 800 MHz band with very low distortion at 20dBm output.

I decided to build up a couple of amplifiers in the Hammond die-cast enclosures (1590ABK) and see how well they would work for DVB-T service. The RFHIC specs. were very specific about not exceeding +12Vdc. Thus to be able to operate them from +13.8Vdc, I also installed a low drop-out voltage regulator, LM-2941CT and set it for 10.8Vdc. This allowed me to operate the modules from +11 to +15Vdc without fear of damage.

So, how well did they work ? A 1.5 GHz swept frequency, S21, test showed they actually were very wide band with about 1 GHz bandwidths and very flat responses.



The gains were about 20dB & 34dB respectively. The low frequency corners were about 20 MHz The return losses, S11 & S22 were quite good over the extended range also, being of the order of -15 dB. I tested the output power vs. input power at 430 MHz. It was very linear for both units with a very sharp knee at the -1dB gain compression point and very rapidly saturating there after. For the RFC-041, P(-1dB) = +33dBm = 2 Watts. For the 1F7534P, P(-1dB) = +30.4dBm = 1.1 Watts.

I next tested the amplifiers for DVB-T service. The RFC-041 worked well up to +20 dBm (rms) output at 441 MHz. At that point, the shoulder break-point was -32dB. Driving it any harder, even by 1dB, compression started occurring. Backing off the drive by only -3dB, lowered the output to +17dBm (rms), but improved the shoulder breakpoint dramatically to -41dB. The RFC-041 could also be used on the 33cm band (915MHz), but with lower max. output of +15dBm (rms) with a -34dB shoulder break-point.

The CATV Trunk Amplifier, 1F7534P put out even more rf power. It worked well up to +23.8dBm (rms) output at 441 MHz with a shoulder break-point of -31dB.

Dropping the drive by -3dB, improved the shoulder to -39dB with an output of +20.8dBm. It was also tested on 915 MHz. The max. output was +18.7dBm with a -35dB shoulder break-point.

One from the vault - UART 232 TO USB Converter

First published in issue 3
Written by John Hudson G3RFL

The FT232R

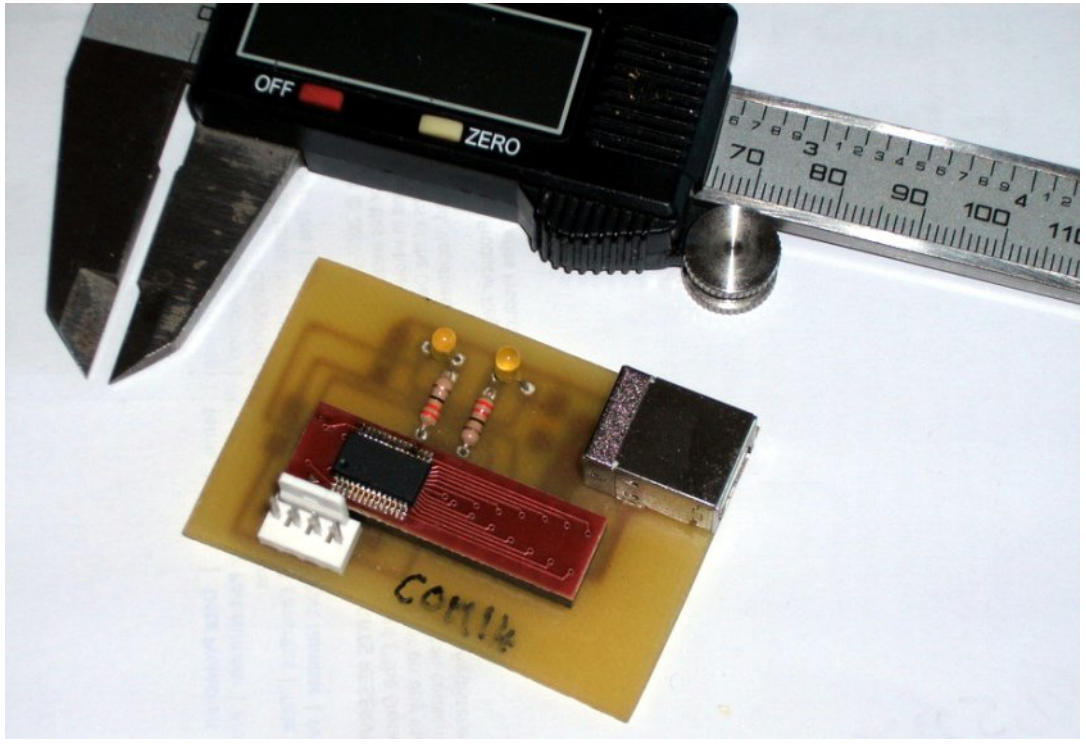
As technology advances so fast many different DATA interfaces take place it becomes harder and harder to keep up. Nowadays the equipment seems to have steadied down to using the USB format and that's what you get on most modern PC's

So I came up with a problem when I wanted to use RS232 the sort of previous standard but find no PC's uses it now and it's a bit slow.

I love writing in Assembler language and using PIC u/P and all have a serial UART type of output some later ones will drive USB direct but need a lot of overhead software understanding to get it correct until I found a little chip that converts UART to USB and does all the fancy set-up logic for you just UART in and USB out it's the FT232RL and its Bi-directional and better still its addressable given many options.

Because I like to make things in building blocks I set out to make a PCB just to run this interface has a test unit for my developments and can be plugged into a DEV PCB with ease. Now on it we have a TX led and an RX led to show it is working and it is all powered from the USB lead I have two 10k isolation resistors on the UART lines to protect the chip from the unit it goes into (u/P).

When you plug the PCB into a USB lead the PCB leds flash has the PC sets things up all by magic registers and you just talk at whatever baud rate you want to the chip and off it goes. It took a lot of time and headache out of doing it. The circuit was even made easier by buying a ready made 28 pins SSOP to 20 pins DIL Socket then I can make it plug-able (my eyes are going now 67).



Just look at devices internal block diagram a really well designed unit by FTDI. It runs on its own internal Oscillator at about 48MHz (see diagram - next page).

There are more complex chips in this series that will do whatever standard you want.

2 FT232R Block Diagram

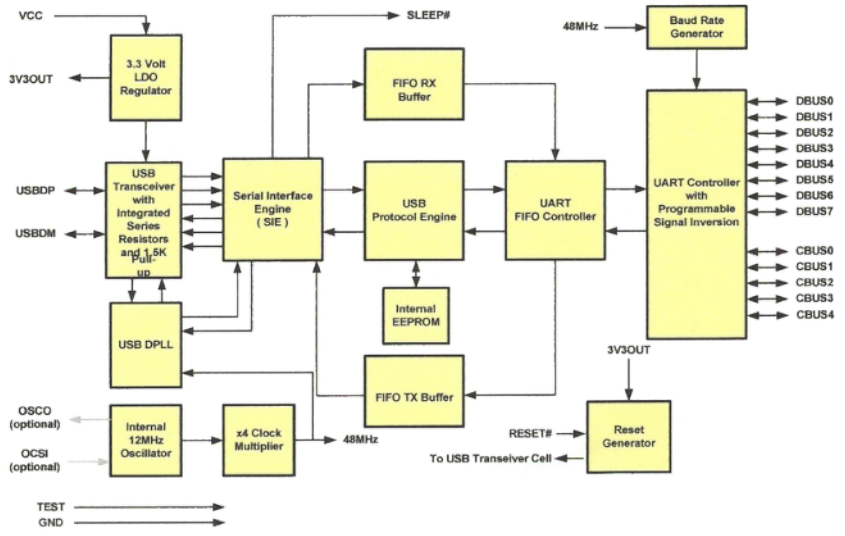
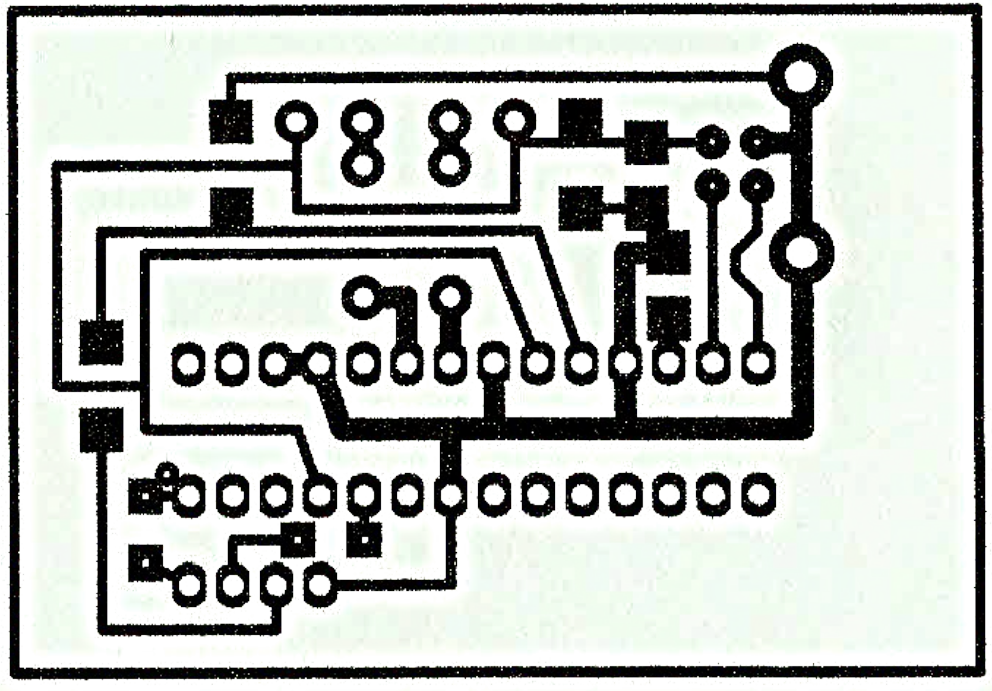


Figure 2.1 FT232R Block Diagram



...From page 30

Time-sharing meant time the family spent together in the evenings and weekends — not purchasing condominiums. We never heard of FM radios, tape decks, CD's, electric typewriters, yogurt, or guys wearing earrings. We listened to Big Bands, Jack Benny, and the President's speeches on our radios. If you saw anything with 'Made in Japan' on it, it was junk.

The term 'making out' referred to how you did on your school exam. Pizza Hut, McDonald's and instant coffee were unheard of. We had 5 & dime stores where you could actually buy things for 5 and 10 cents.

Ice-cream cones, phone calls, rides on a streetcar, and a Pepsi were all a nickel. And if you didn't want to splurge, you could spend your nickel on enough stamps to mail 1 letter and 2 postcards.

You could buy a new Ford Coupe for $600, but who could afford one? Too bad, because gas was 11 cents a gallon.

In my day, "grass" was mowed, "coke" was a cold drink, "pot" was something your mother cooked in and "rock music" was your grandmother's lullaby. "Aids" were helpers in the Principal's office, "chip" meant a piece of wood, "hardware" was found in a hardware store and "software" wasn't even a word.

We were the last generation to actually believe that a lady needed a husband to have a baby. We volunteered to protect our precious country. No wonder people call us "old and confused" and say there is a generation gap.

How old do you think I am? Pretty scary if you think about it and pretty sad at the same time.

This woman would be only 68 years old. She would have been born in 1952.

Source: Anonymous

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