In this issue

Editorial..... 2
DATV News.....4
A VSWR Tool for ATV 23cm 1230 to 1350MHz.... 6
IARU ATV Contest..... 10
International ATV meeting 2016..... 11
Contest Number Generator - Update..... 13
DATV-Express Project - May update report.....14
Teletext Editing Software and
RaspberryPi Server..... 15
Video Matrix.....19
Raspberry Pi Zero -
Very Simple Colour Bar Generator.....21
My life with Teletext.....23
Information.....27
Coming up.....28

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Editorial

Welcome to CQ-DATV 36, its always a pleasure to find Television related projects, last issue it was Alan G3SXC investigating 3D printers, this issue John G3RFL has been outside looking at his aerial farm and has tasked Alan to machine him some new parts, more of that in CQ-DATV37.

While John is waiting for the parts he has started on a new project, a VSWR monitor that will interface to his TFT screen that is already displaying aerial direction from a previous article.

John has asked us not publish the RF sensors for the VSWR project yet as he feels there are a lot of improvements to be made over the temporary ones his is using at the moment, so we have split the project up into two parts. John's ultimate objective is a TFT screen that will indicated aerial direction and VSWR and perhaps more let's wait and see.

Mike G7GTN and Peter Kwan have been looking back at Teletext.

For those of you who have not seen it, we had two systems in the UK both fully compatible with each other just different services, the BBC ran Ceefax and ITV ran Oracle. They both used a data transmission in the vertical interval to carry pages of a book, you could request the page you wanted from the TV handset and eventually when the transmission data transmitted that page it, would go into your decoder memory and display text and some rather blocky graphics, could be a bit of a wait, but popular pages were repeated more frequently to help overcome this.

Early decoders using simple Logic gates were rather complex, but soon the custom chipsets arrived and the decoder could be as simple as three or four chips.

The transmission was a little more complex in ITV we had a large Teletext computer centrally located at ITN and the ITV programme network was switched in a such a way that we always had a feed of the ITN pictures (useful for news flashes). The data was then lifted off in a data bridge and put on the station output, so you always got the data from ITN, well almost always, but in true TV fashion if we lost the feed or messed up the switching there was an automatic apology page.

What was interesting was the rack size of the data bridge and local pages, I never saw the ITN end, but to put this together with a Raspberry PI just shows how far we have come in micro computing power.

We might have lost Teletext with the coming of digital television, but I suspect being squirrels at heart there will still be ATV enthusiasts with a Teletext equipped TV in the shack, and well we still have analogue ATV repeaters that might benefit from Teletext, if not just treat it a blast of nostalgia.

Before you turn your attention and settle down, we hope, to enjoying CQ-DATV 36, can I just stress that this magazine is put together and distributed free without any commercial input. We can only go on producing this publication subject to the availability of copy or to put it another way, articles don’t just appear out of thin air we need your contributions.

Please enjoy CQ-DATV 36

CQ-DATV Production team

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://www.agaf.de/

Check out the DKARS website at:-
http://www.dkars.nl/

Contest?

As far as I have seen them, in most of your magazines I did not notice any attention for the IARU ATV contest.

In several countries there is a lot of ATV activity but even when just one contact is made, it would be appreciated to receive a log. No fancy log-installation or so, just open the excel sheet, fill out some fields, save it and send it to the mentioned email address.

The rules and logsheet are on the IARU website but a bit hard to find, therefore I give you the link:

http://pi6ats.nl/ATV%20contest%20log%20-%20ATV_yourcall_YYYYMMDD.xls

Results from last year:

http://www.iaru-r1.org/index.php/vhfuhsshf/1455-atv

If you do not have an ATV station but you have SDRsharp running with (for example) an RTLstick: you can easily receive ATV signals in the 70 cm and 23 cm band by using TVsharp. No additional installation, just run TVsharp.exe instead of SDRsharp.exe. (It is AM but you can detect FM with it). Link for direct download of TVsharp:
http://pi6ats.nl/tv.zip

Hopefully you could pay attention to it on your website and/or local infrastructure. ATV could stimulate activity and interest in frequencies VHF-and-above so lets give it a try!
Best regards, Naslov Prispevka

(*Editors note:- In order to publish this sort of information - you have to tell us, we are not mind readers*)

Rally

The BATC were at the Luton Radio Rally today, Sunday 22nd May. Tony G1HBD also brought his OB vehicle. Lots of visitors,. The weather was dry and sunny and an interesting time was had by all.

Minitioune V0.4c (new version)

Minitioune v0.4c is now the last version.(19/05/2016)

Main improvements over the v0.4b:-

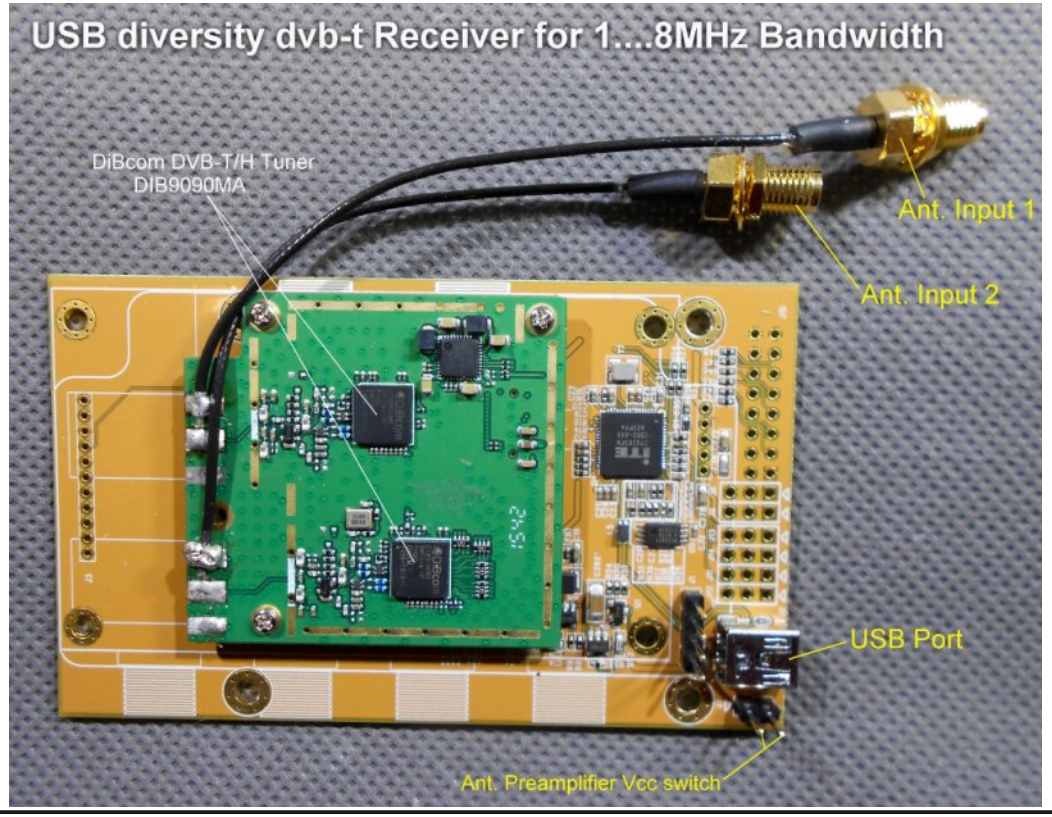
- *Fix the bug with autoPID that did not work the first time if set in the .ini file.*
- *Fix the TiouneMonitor bad display of frequency when several freq buttons have same frequency*
- *Correction of some bad colors in the interface*
- *Fix bad picture format in TiouneMonitor when in auto QSL/video mode*
- *Add a message during loading*

You can download it here:
http://www.vivadatv.org/viewtopic.php?f=60&t=470
Jean-Pierre F6DZP

New ITE Hides product, USB receiver.

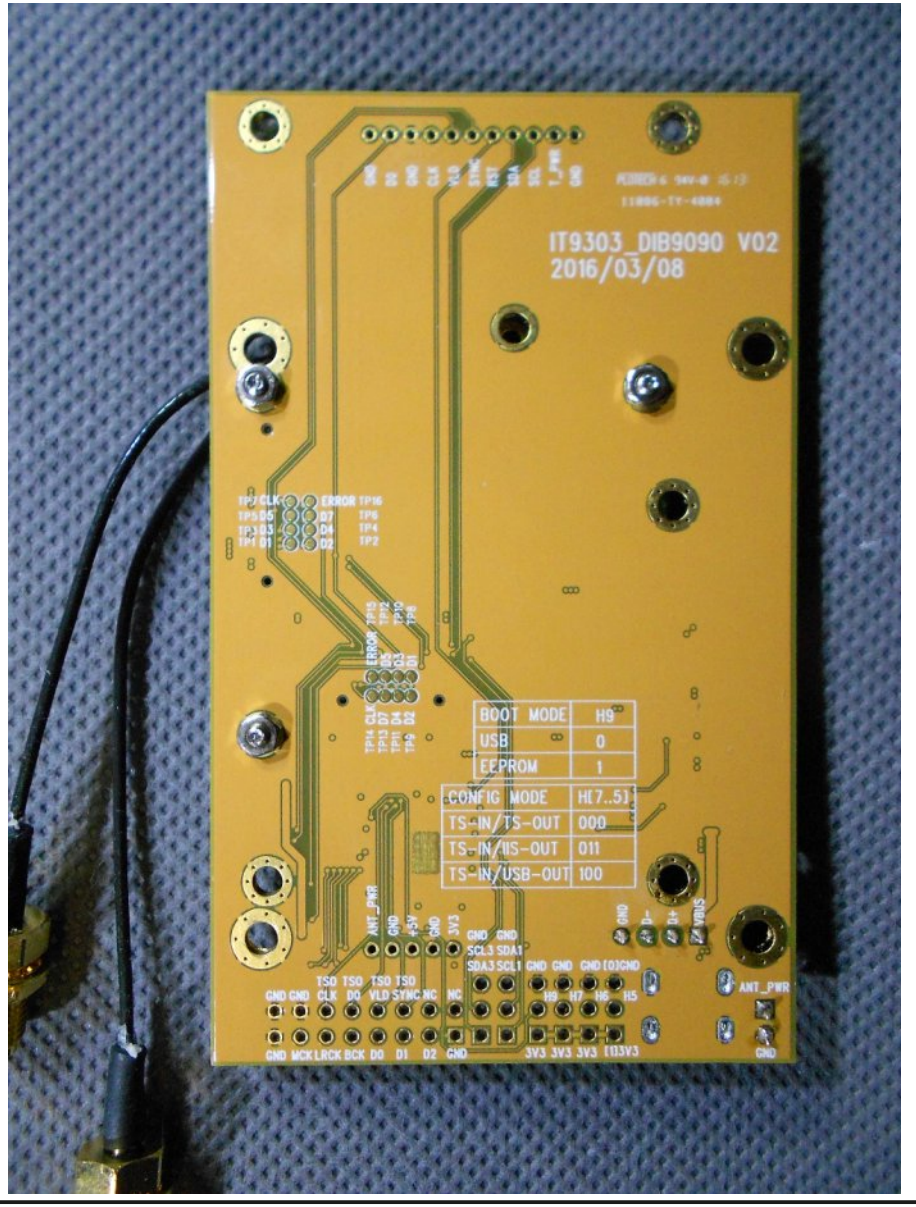
UT-160 USB receiver 1 ... 8MHz BW Diversity
UT-160 USB Receiver for 1 ..... 8 MHz Bandwidth
Diversity function !! Two input for two antennas (later Gibt's version with 4 inputs)
Bandwidth: from 1MHz to 8MHz
Frequency range: 170MHz 858MHz .....
Housing size is the same as standalone receiver HV-110. It is planned for the end of June 2016 available housing at HamRadio 2016 as Hides Fair novelty. Diversity function !! Two input for two antennas (later version with 4 inputs) Bandwidth: from 1MHz to 8MHz Frequency Range: 170MHz 858MHz ..... Chasis size: 10cm x 4cm x 7cm Scheduled for the end of June 2016, available on HamRadio 2016 as Hides fair novelty.

Final product, here without chassis



Software download on Dropbox link:
https://www.dropbox.com/sh/2msm16q9c566 ... M5gPa dl = 0?User guide:
UT-160 USB Receiver Diversity Dongle_QIG_v1.0_20160518.pdf (799.54 KiB)

Source: Darko Banko



A VSWR Tool for ATV 23cm 1230 to 1350MHz

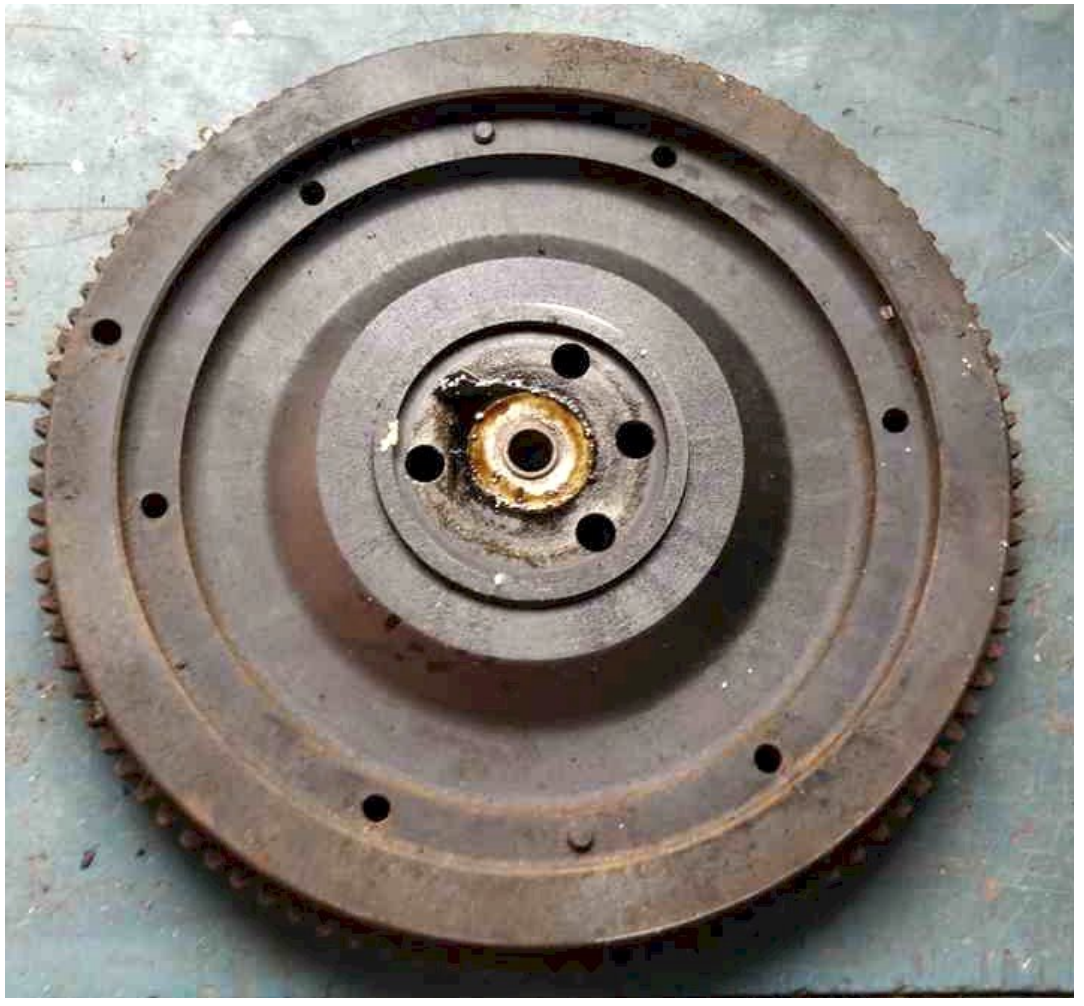
by John Hudson G3RFL

So summer is here and at last I can stand being outdoors, without my fingers going numb and my ear lobes stinging, well that's the definition of summer in the UK isn't it.

Summer is also the time of year when time outdoors is compromised by tasks called gardening and to top it all off, the lawn starts to grow and needs repeated cutting.

Using this new found outdoor freedom to it best advantage I turned my attention to my aerial farm, well I use the term farm in its broadest sense it's a pump up mast and rotator, but I like to call it an aerial farm.

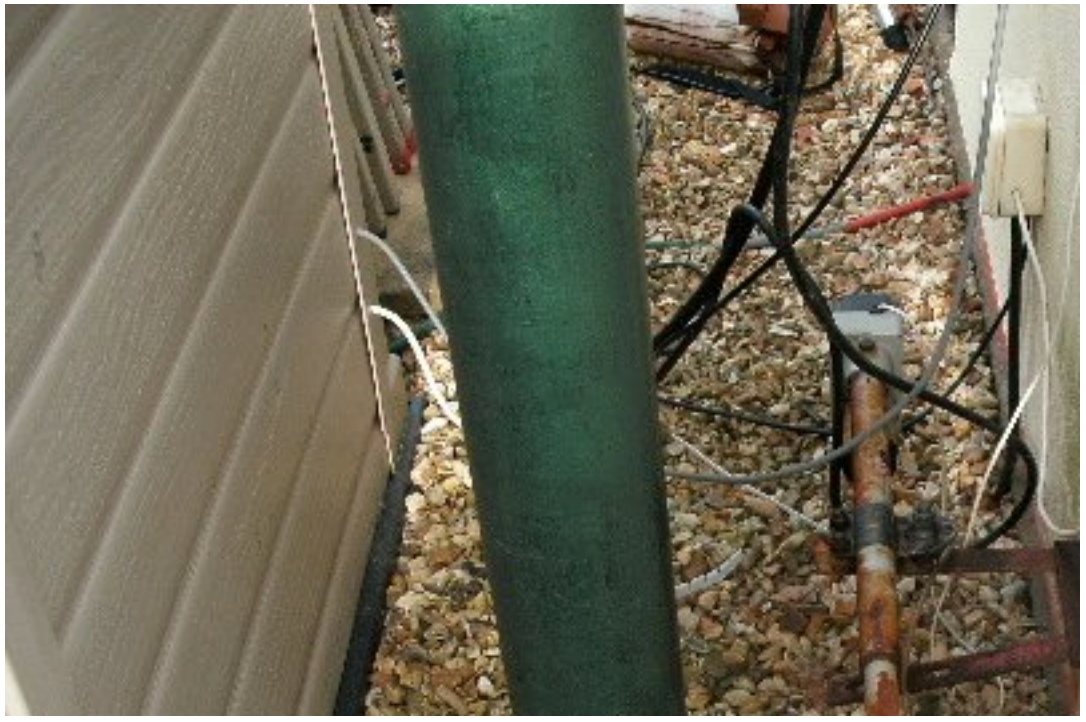
The first update will be to add a motor car flywheel and motor so that I can power the 23 cms antenna through 360 degrees at the moment it has a SAT 12 Linear Actuator which will only rotate it through 110 degrees.



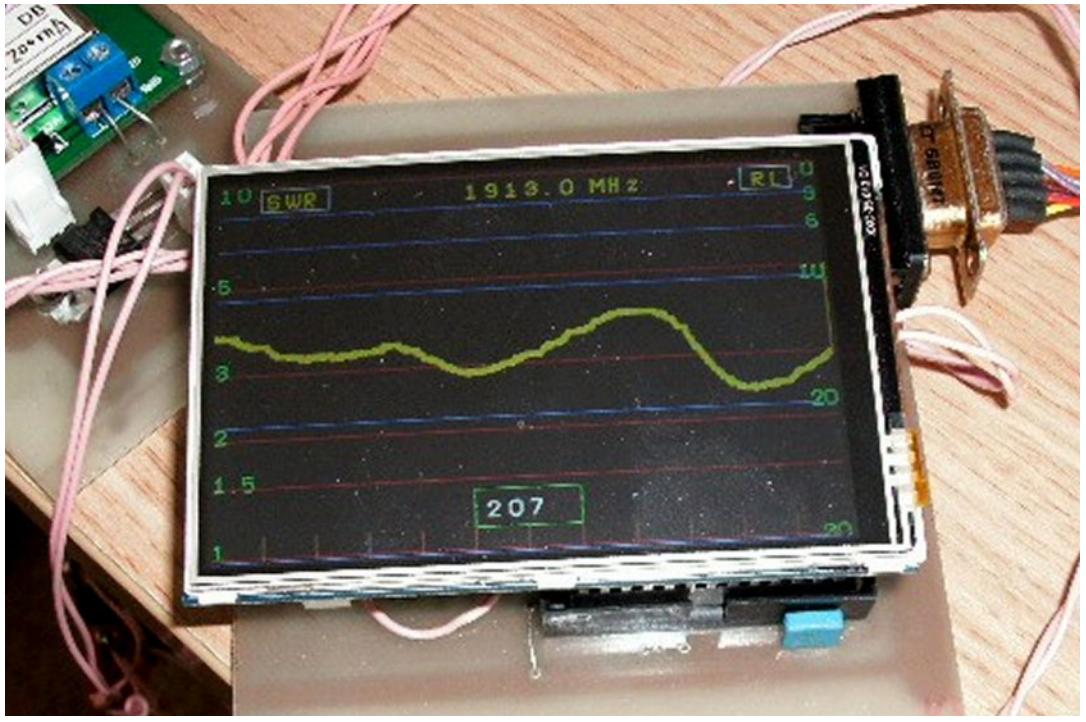
Motor Car Flywheel need machining to fit the pump up mast through the middle Alan G3SXC is on with that at the moment

This will enable the display of polar plots using the Mag sensor and a simple detector.

The antenna has positional feedback provided by a 60p sensor and is II2C connected to the shack down a simple quad cable (never been one to skimp if it needs 60p then it gets 60p)



Note how RUSTY the LINEAR ACTUATOR has become due to the sea air



TFT in VSWR Display mode

This position sensing was written up in CQ-DATV issue 33 (available free from the *CQ-DATV download site*). More on that when Alan mills out a suitable hole on the flywheel.

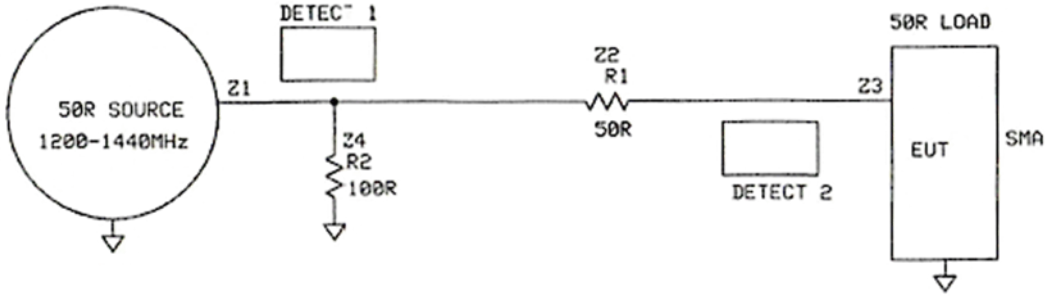
While I await the machined flywheel and perhaps an even bigger rise in UK temperatures, I also want to add some SWR diagnostics, as I have never been sure that this is correct across the band, I do know that it is optimised at 1270MHz.

To interface the SWR diagnostics to the £11 TFT LCD Colour Display that at the moment only displays the direction of the aerial and little else. So I started on the project I had been planning through the cold days of winter an SWR indicator that could be interfaced to the direction indicating TFT screen (which may by the next issue, rotate through 360 degrees, fingers crossed).

This is a little complex I need a calibration source and a two channel A/D input.

The source needs to be linear in both frequency and amplitude and yes you have it a YIG was just perfect, I built the YIG control module, at the heart of this was a dsPIC30F4012 PIC and the software enables me to control the YIG from 1230 to 1350MHz.

The TFT display screen is 480 x 320 Pixels so I settled for 0.25MHz per pixel step, so across the screen I had a 120MHz sweep . The X trace and Y trace had two detectors and these are the key to accurate measurement. If you think it sounds easy well let me tell you I am currently on version 4 and it might not stop there so you are going to have to wait for CQ-DATV 37 to see these revised designs.



Block Diagram of the unit

I am using the 10bit A/D so we get a value of 0 to 1023 on each channel, remember the TFT screen is not like a normal TV screen there is attached memory to store the screen image which removes the requirement for a frame or field store.

Lots of MATHS are required to work out the RL (return Loss) and VSWR (standing wave ratio), some time I wish I had paid more attention to my maths teacher at school, I just never thought I would use what he was selling.

To work out the SWR, this has this is the ratio of one to the other and involves lots of sub routines to place Values and Text. At the moment they are showing the A/D values and Freq in 0.5MHz steps (5 digits).

I used Diode detectors and as we all know diodes are not linear devices. I did get some advice from Tim Forester G4WIN.

John re your VSWR and the low power and non linear diode detectors have you considered instead of producing more RF power to overcome the non linear characteristics of the detector diodes why not place some low power amps ahead of the detector diodes thus increasing their sensitivity ?

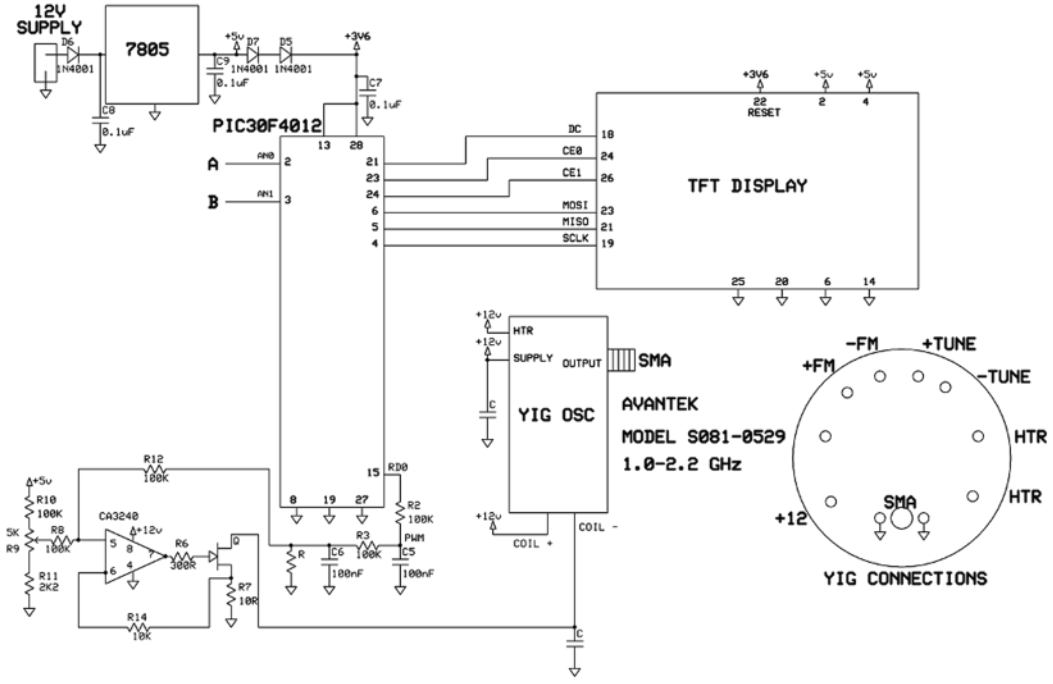
Return Loss to VSWR Conversion Table

Return Loss (dB)	VSWR	Reflection Coefficient, Γ	Mismatch Loss (dB)	Reflected Power (%)	Through Power (%)
1	17.39	0.891	6.868	79.43	20.57
2	8.72	0.794	4.329	63.10	36.90
3	5.85	0.708	3.021	50.12	49.88
4	4.42	0.631	2.205	39.81	60.19
5	3.57	0.562	1.651	31.62	68.38
6	3.01	0.501	1.256	25.12	74.88
7	2.61	0.447	0.967	19.95	80.05
8	2.32	0.398	0.749	15.85	84.15
9	2.10	0.355	0.584	12.59	87.41
10	1.92	0.316	0.458	10.00	90.00
11	1.78	0.282	0.359	7.94	92.06
12	1.67	0.251	0.283	6.31	93.69
13	1.58	0.224	0.223	5.01	94.99
14	1.50	0.200	0.176	3.98	96.02
15	1.43	0.178	0.140	3.16	96.84
16	1.38	0.158	0.110	2.51	97.49
17	1.33	0.141	0.088	2.00	98.00
18	1.29	0.126	0.069	1.58	98.42
19	1.25	0.112	0.055	1.26	98.74
20	1.22	0.100	0.044	1.00	99.00
21	1.20	0.089	0.035	0.79	99.21
22	1.17	0.079	0.027	0.63	99.37
23	1.15	0.071	0.022	0.50	99.50
24	1.13	0.063	0.017	0.40	99.60
25	1.12	0.056	0.014	0.32	99.68
26	1.11	0.050	0.011	0.25	99.75
27	1.09	0.045	0.009	0.20	99.80
28	1.08	0.040	0.007	0.16	99.84
29	1.07	0.035	0.005	0.13	99.87
30	1.07	0.032	0.004	0.10	99.90
31	1.06	0.028	0.003	0.08	99.92
32	1.05	0.025	0.003	0.06	99.94
33	1.05	0.022	0.002	0.05	99.95
34	1.04	0.020	0.002	0.04	99.96
35	1.04	0.018	0.001	0.03	99.97
36	1.03	0.016	0.001	0.03	99.97
37	1.03	0.014	0.001	0.02	99.98
38	1.03	0.013	0.001	0.02	99.98
39	1.02	0.011	0.001	0.01	99.99
40	1.02	0.010	0.000	0.01	99.99

Also found a useful VSWR conversion data sheet on the net

He was not alone looking at what other people have done overcome the diode detector voltage drop or its crushing at the top end. Because these occur at the bad SWR end, so I opted for 13db 0.5W AMP from Ebay to increase the drive to the detectors.

Maths corrections can be done on the input volts if needed, but at the moment I think I can use these to not only get the linear FREQ but the AMPLITUDE linear has well. (more on these in CQ-DATV 37).

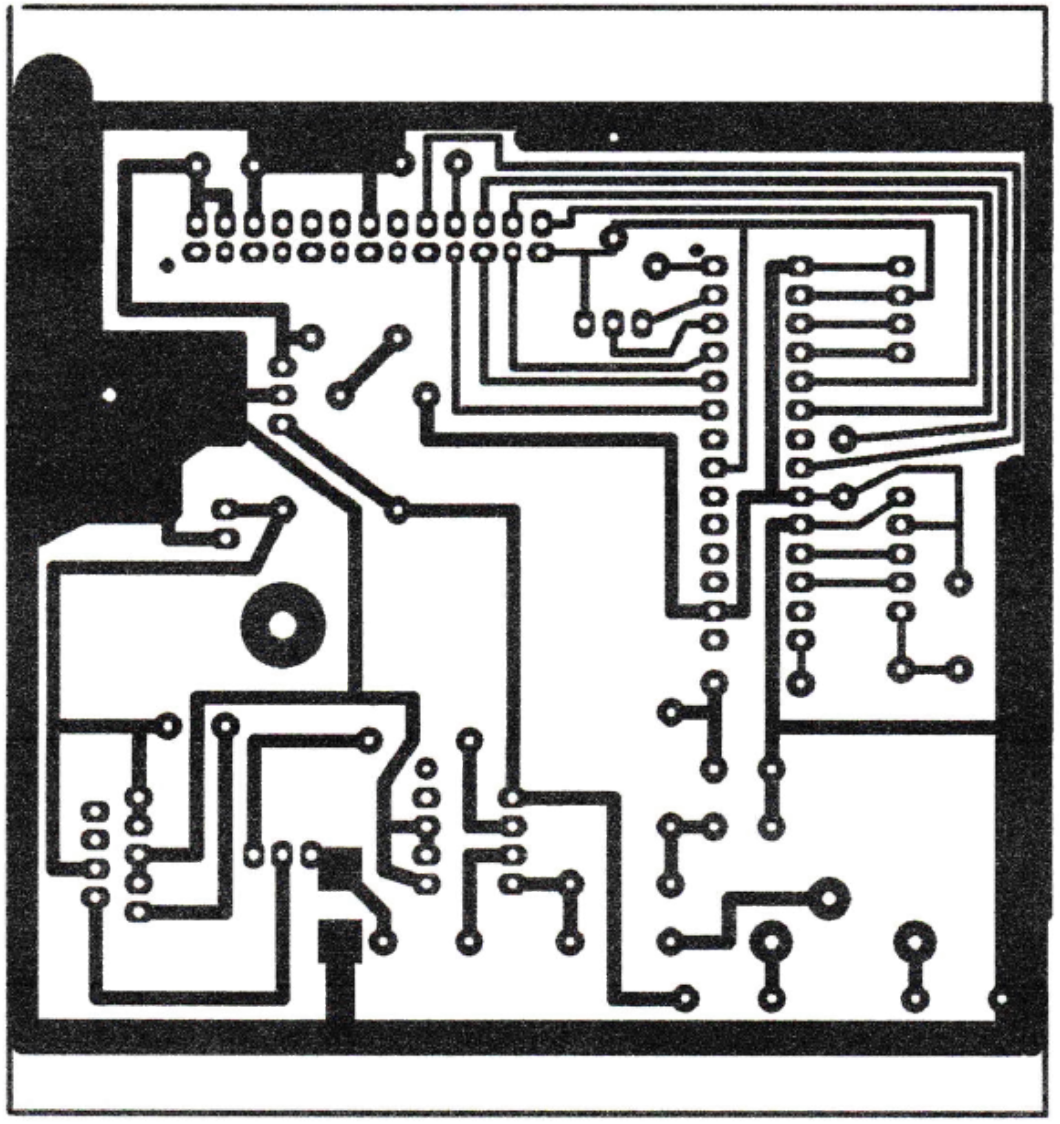


VSWR part 1 display

I have split the diagram into 2 parts so that I can improve the second part which is working but as my school reports always said there is room for improvement.

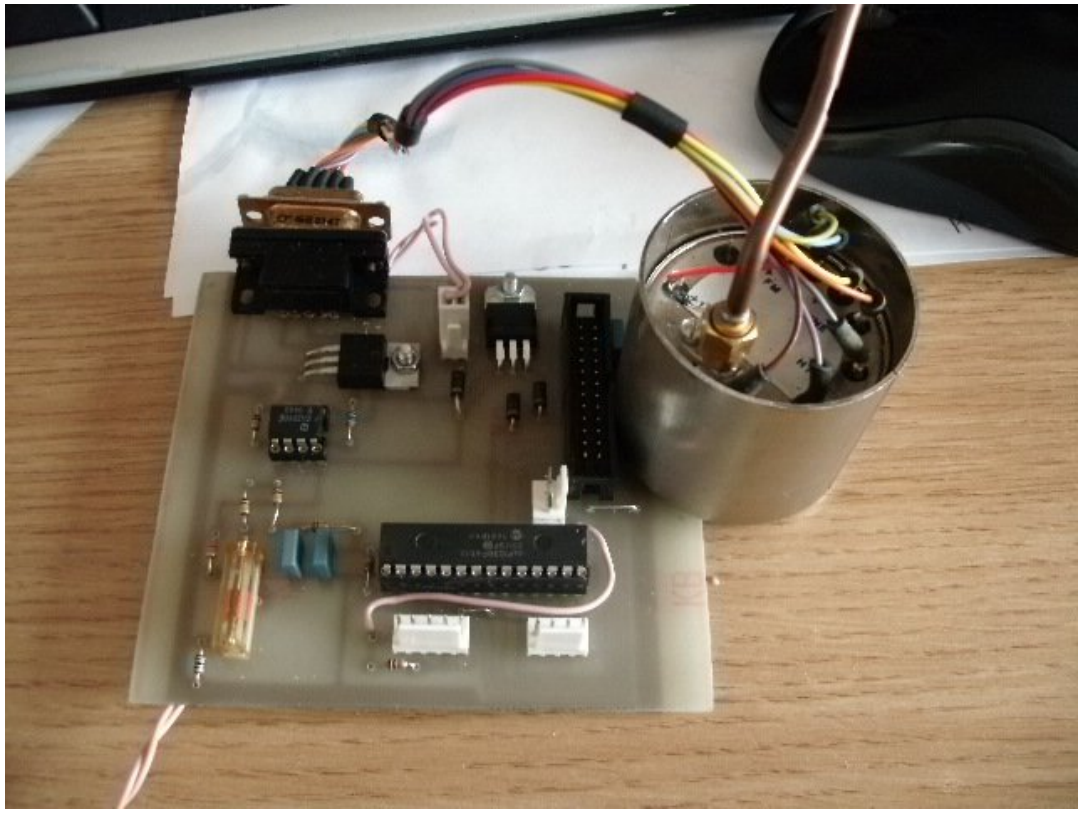
R9 pot sets up the lower FREQ and the R near to C6 sets the Upper FREQ, the coil used is the tune one and the FM is not used.

When you buy these they come with a 9 PIN "D" type plug so I fitted a "D" 9 pin socket on the Display PCB.



PCB for the project viewed from the component side

The Display PCB will be the same as in the development units and the detectors will be just a PIGGY PCB.



Populated PCB

The Detector outputs A and B have a 3 pin KK connection, the DETECTOR PCB has a SMA to SMA RF lead at 23cm.

The TFT screen will of course have the bezel from the last issue that Alan made using his 3D printer

To be continued in CQ-DATV 37

IARU ATV Contest

Don't forget the annual IARU ATV Contest is happening in 2 weeks time on **Saturday/Sunday 11/12 June**.

The International Contest includes all bands from 432 MHz up and additionally, the BATC will run an ATV Contest on 71 MHz and 146 MHz at the same time, so the contest will effectively be "all bands" in the UK. To encourage RB-TV activity there will be be 2 prizes of £50 Amazon Vouchers for the best DX RB-TV Contact during the contest.

- *The contest runs from 1pm BST on Saturday 11 June until 7 pm BST on Sunday 12 June*
- *All bands from 70 MHz upwards - analogue and digital.*
- *Full details and links to the log sheets are on the BATC Forum:*

http://www.batc.org.uk/forum/viewtopic.php?f=75&t=4519

- *At least 4 stations have already committed to going out portable. Please post details of your planned activity on the forum.*

It would great to see as much activity as possible - you don't have to go out portable and if you just work your normal contacts across town, please submit a log as it would be good to show the rest of Europe how active we really are!

International ATV meeting 2016

Every year ATV enthusiasts from Italy, Austria and Slovenia get together. This year the meeting was held in Maribor on the 9th of April in the Qlandija shopping centre which incidentally coincided with an exhibition on the 70th anniversary of the Maribor radio club.
https://www.youtube.com/watch?v=bswzCDNksfw&feature=youtu.be

After the visit we drove to a nearby hill, Sv. Urban, near a pleasant inn. To bring us up to date there followed by a presentation. From Austria came OE6RKE Robert Wilhelm OE6VLG, Pauline OE6YLF. From Italy Mauro IV3WSJ, from Slovenia Štefan S51L, Rudi S58RU, Dolf S52DS, Josip S54JP, Marjan S56EJL Stane S57UCB Andrej S56WAN and Marjan S58TX.

Whilst having good home-made food, we talked about the possibilities of connecting ATV repeaters between the eastern and western parts of Slovenia.

Due to the configuration of the ground this would be very difficult. However the possibility that this could be through Austria and Italy.

Once in Austria Gerlitzu again on the ATV repeater. In solving this problem it is Robert OE6RKE suggested using Hamneta.

Most of us are not familiar with this method of communication, so we were briefed by various ATV enthusiasts.

A current theme in the field of equipment is the introduction of digital television. There are different standards. In Austria the mainly of type DVB-S. Slovenia and Italy, DVB-T, which has proved better in the conditions when there is no direct visibility between the transmitter and the receiver.

This was followed by a practical demonstration of the recption of various ATV signals. The repeater S55TVL Ljutomer we received both analog and DVB-T to 1.2GHz. Wilhelm OE6VLG accessed the Khunegg OE6XLE analog repeater and Dobl near Graz DVB-S and 10GHz award from Hutwischa. Due to bad weather, the reception of the repeater on the Koralpe failed.

Traditionally, these meetings present new products in this area, which this time did not happen. Another reason was because of language problems due to not understanding the three languages.

We went home happy because we learned about new ATV repeaters, their work and installations.

73, Štefan S51L

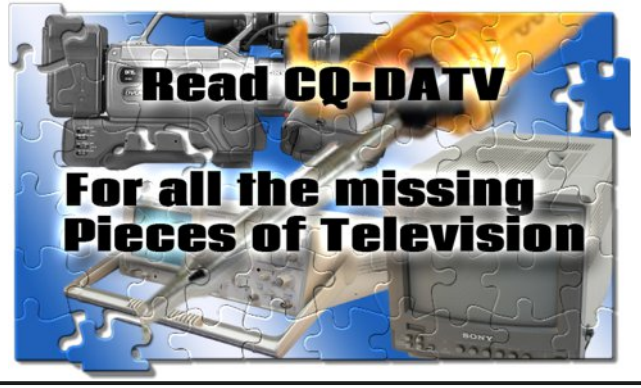
Raspberry Pi Zero Contest Number Generator - Update

Mike G7GTN

The contest number generator from issue 35 was always intended as a dedicated project.
Since the pi Zero modules are still rare the following small changes will allow the use of a mouse to close the python interpreter down and hence allow you to escape from full screen mode and continue working.

```
# Line 105
pygame.init()
pygame.mouse.set_visible(0)

# Line 319
while running:
    for event in pygame.event.get():
            if event.type == pygame.QUIT:
                running = False
                pygame.quit(); sys.exit();
            # Any mouse button to quit - add after line
            if event.type == pygame.MOUSEBUTTONDOWN:
                pygame.quit(); sys.exit();
    time.sleep(1)
```



DATV-Express Project - May update report

By Ken W6HHC

The good news is that the Express_DVB-S_Transmitter software (long discussed on the Forums) for using the hardware board in a Windows environment is now available for download in BETA-release. The BETA-version v1.10 can now be downloaded from the DATV-Express web site at *www.DATV-Express.com* on the DOWNLOADS page. Also available on DOWNLOADS page is a NOTES.TXT file (aka README) for v1.10. No User Guide is yet available for this BETA release. One of the real advantages of this software for windows is that it uses the FFmpeg library of software CODECs (H.262, H.264, and H.265) for encoding the video (no Hauppauge boards needed). Figure 1 below shows the MAIN user interface screen when running the Express_DVB-S_Transmitter software

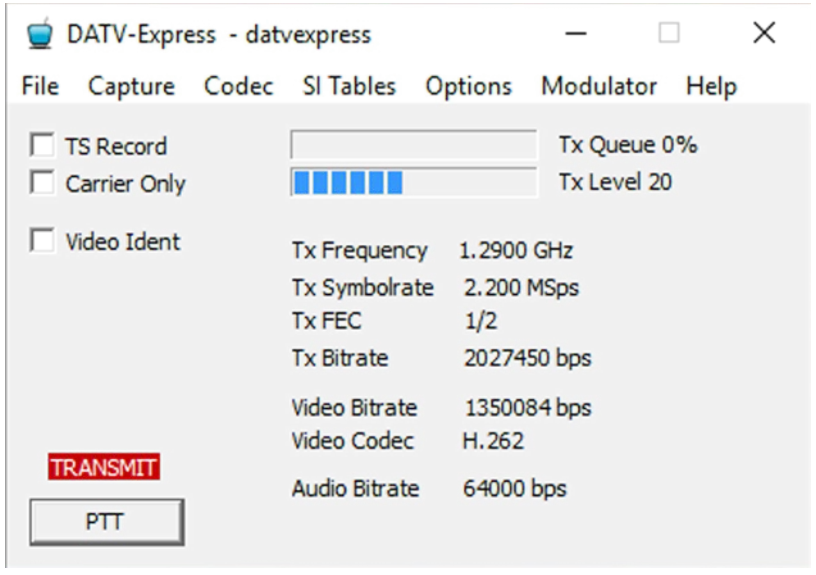


Fig 1- The MAIN users screen running Express_DVB-S_Transmitter. The PTT button has been toggled to the TRANSMIT mode.

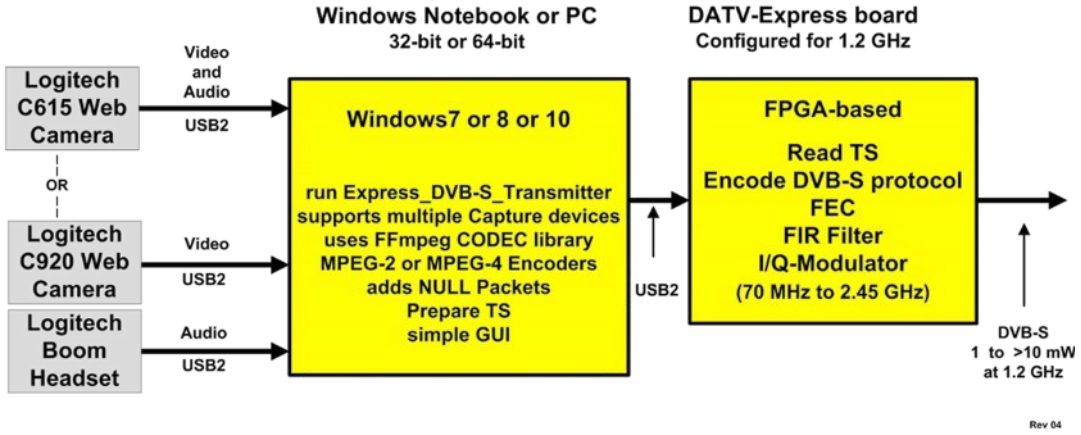


Fig 2- Typical set-up for Express_DVB-S_Transmitter software for Windows that was tested on Win7 and Win10.

W6HHC testing used both the LogiTech C615 and C920 webcams for MPEG-2 (aka H.262). WA8RMC testing included a NTSC video camera with a EasyCap USB-dongle. G4GUO testing favors using vMix video software with Decklink mini recorder or the Magewell USB3 dongles.

One of the impressive features (to me) of this software implementation that Charles G4GUO has achieved is that the video latency is less than 0.5 seconds for MPEG-2 encoding…much smaller than even my old trusty SR-Systems Minimod hardware transmitter could achieve.

The next step is to complete a draft version of a Users Guide for this Windows software (already started).

73…de Ken W6HHC (project speed set to slow…)

Teletext Editing Software and RaspberryPi Server

Mike G7GTN

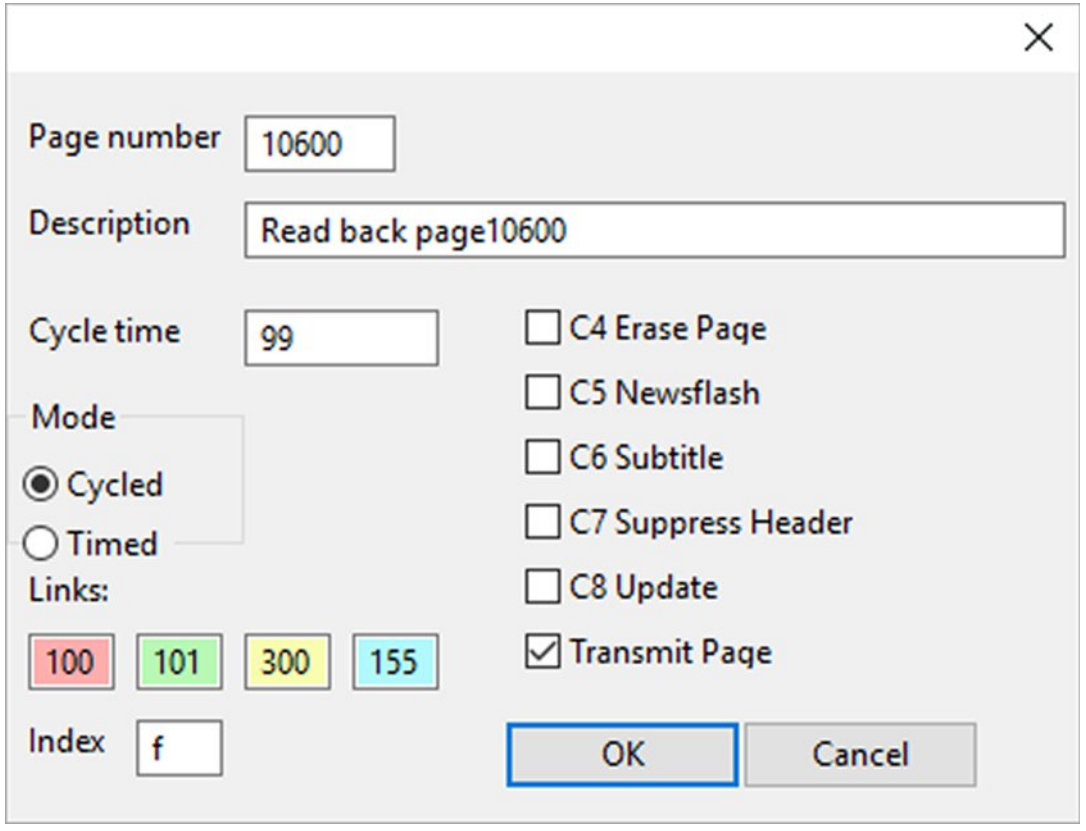
Following on from Peter's personal TV engineering introduction it is very nice to see his quite considerable teletext knowledge & expertise has been put to very good use. We will have a quick look at the Windows PC software he has written to allow us to create our own full specification (Vertical Blanking Interval) level 1 teletext pages.

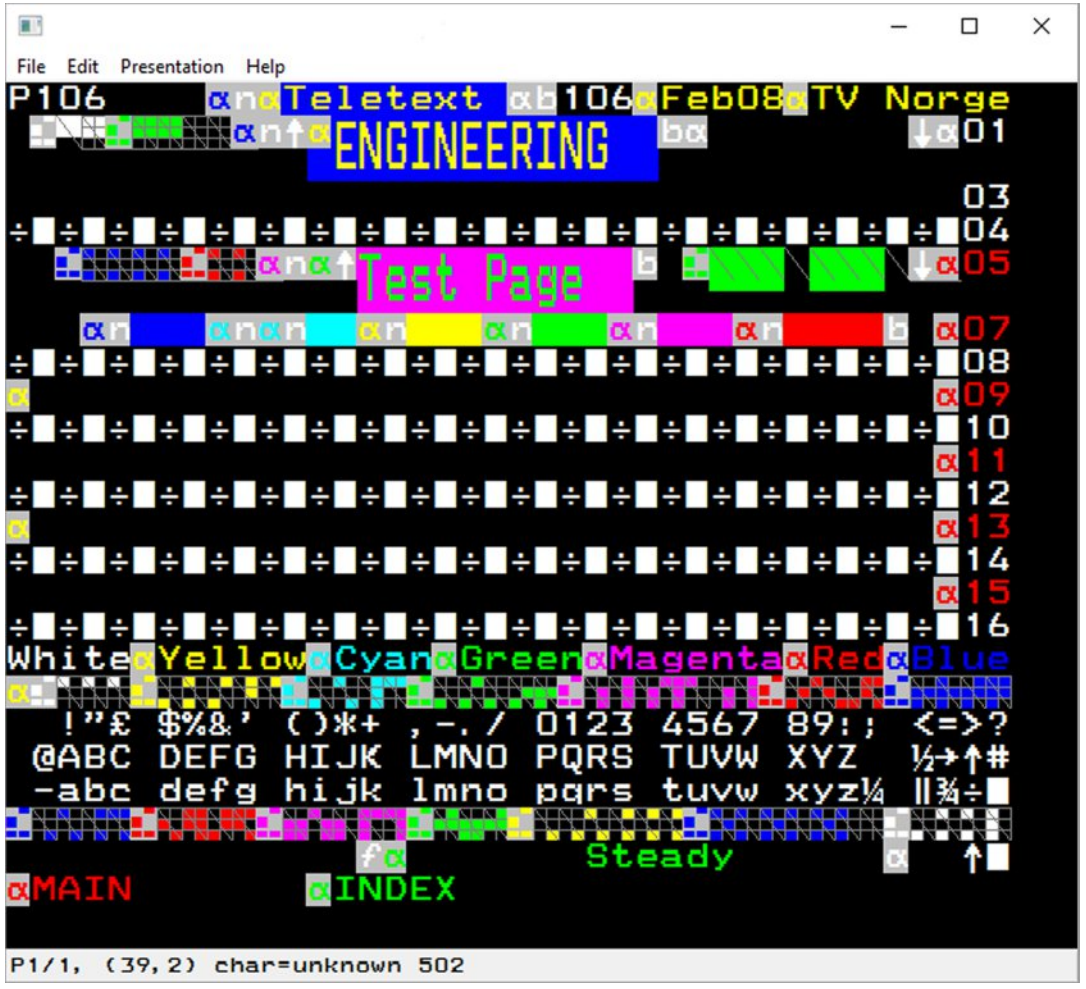
As with the teletext that we probably all now fondly remember we can create our own pages in a much more simplified fashion and no more hacking or manually compiling hex files to insert the required control codes in to Eproms as with the original G8CJS Teletext Pattern Generator.

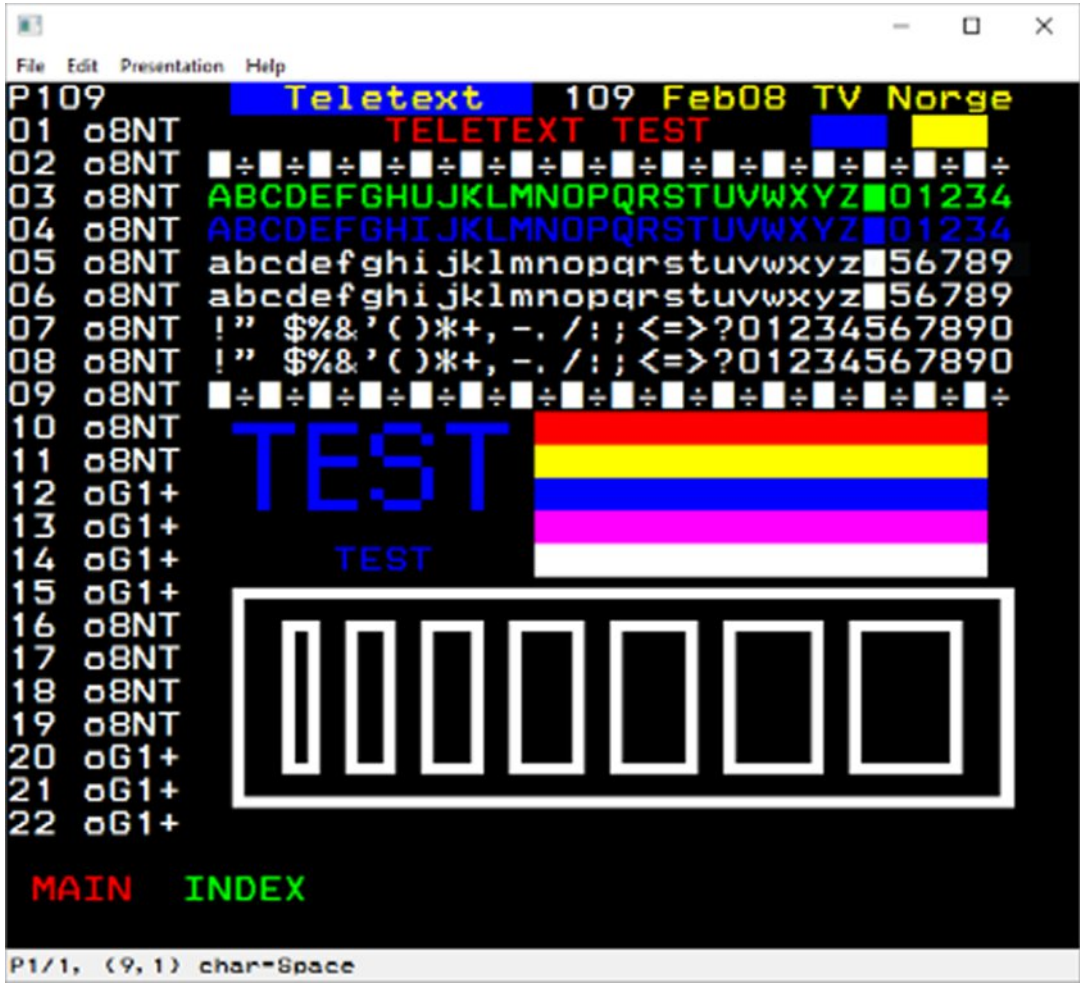
Certainly an excellent manual in PDF form is already part of the free software download package, so is worth twenty or so minutes of your time to read this and become better acquainted with all the features he has created.

On launching the application you will be presented with a sample page 100 that you can start to edit straight away.

Pressing the ALT key will make all the teletext control codes visible.







Designs being composed within the wxTED teletext editor software

A large selection of pages is very helpfully included in the download so you should be able to quickly start designing your own unique screens.

One very nice feature is the ability to assign the four fastext remote buttons (RED-BLUE) if you wish to do some page linking.

The properties dialogue box allows you to make use of this. These links all sit on line number 24.

Now making use of the teletext signal – the ubiquitous analogue television

Using the raspberry pi Zero and the VBIT software we can send our own teletext service to any television set that has a teletext decoder built in.

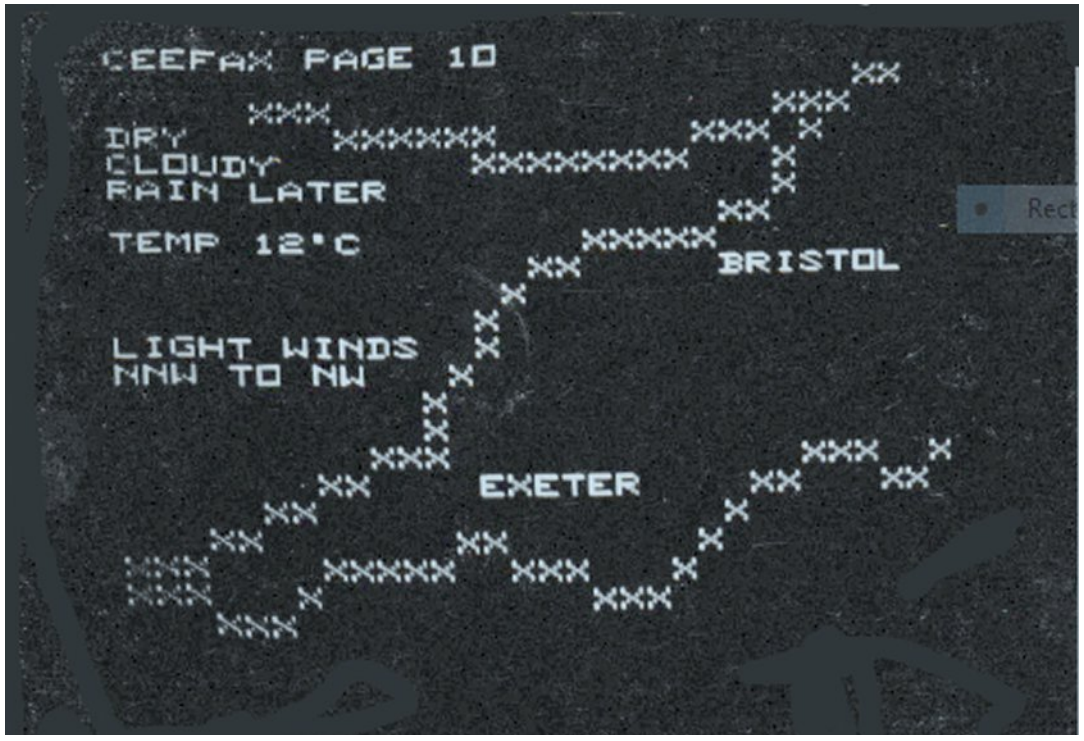
Your self-designed pages are stored in the /home/pi/pages directory and will be loaded on pressing the remotes teletext button.

Real teletext output as seen on an analogue portable

Following the supplied instructions on the VBIT website allowed me to have this running in less than 5 minutes.

My pages were transferred to the pi Zero using the Microchip ENC28J60 Ethernet module. A most handy feature is that changes made in the editor package will be immediately updated on the television on transfer if you are still sat on this page. This makes testing out quick ideas very functional indeed.

The full source code for both the PC teletext editor and the VBIT server code are all freely available.
So if you want to better understand how this has been done you now have an excellent educational resource at your fingertips. There is also an active Facebook Group for all teletext discussions which is in the reference links.



Picture from Alan G3SXC of homemade teletext decoder output. How times have certainly changed.

Web References

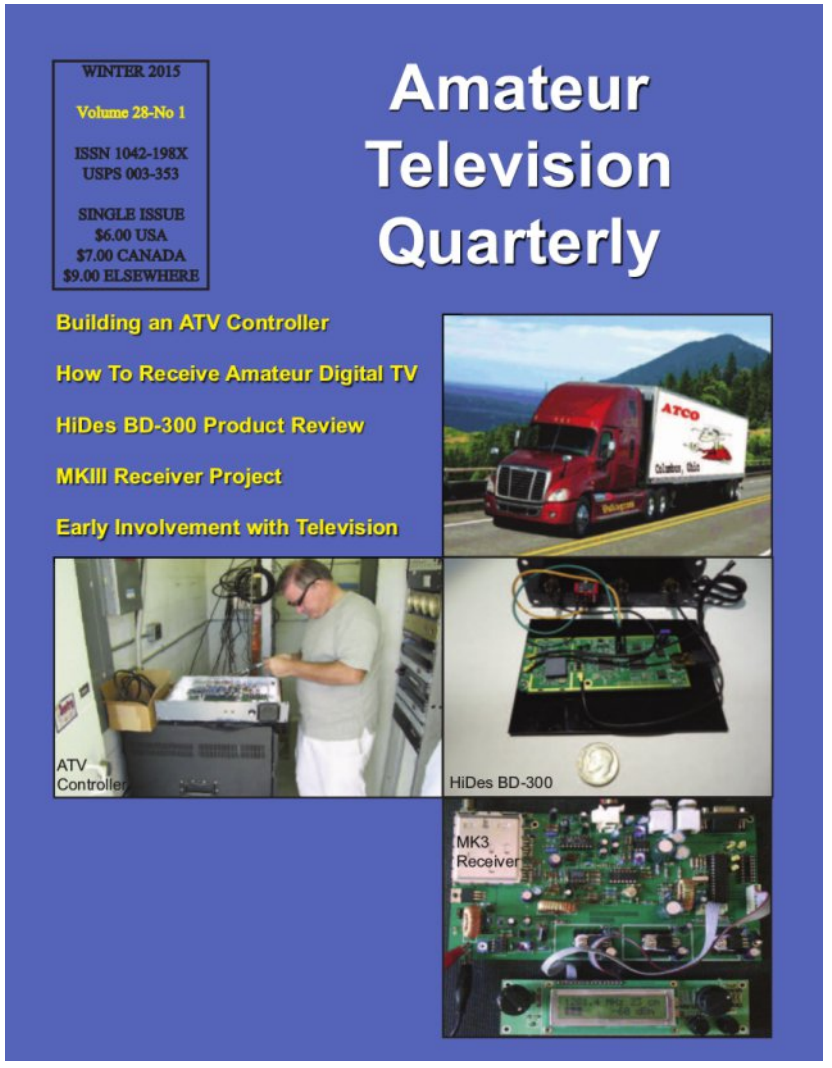
wxTED PC Teletext Editor
http://teastop.co.uk/teletext/wxted/index.html

VBIT homepage
http://teastop.co.uk/teletext/vbit

Facebook Teletext Group
https://www.facebook.com/groups/TeletextGroup/

IBA Technical Review No 20 Developments in Teletext
http://www.ntlpa.org.uk/memorabilia#

BBC CEEFAX – A step toward the digital world video clip *http://www.bbc.co.uk/programmes/p0166zr3*



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Video Matrix

By Ulrich Vogel - DK4BT

This article first appeared in TV AMATEUR 180

Due to the ever increasing number of video sources in the Shack, I had an increasing desire for an electronic switching matrix for the four video receivers, each of which could be routed to the main monitor for viewing.

The project was going to be a home build unit and the main source of components was going to be my junk box, which ruled out SMD devices. I decide on microprocessor and a numeric keypad for the control.

The keypad can select one of four analogue voltages routed along one of three lines to the micro controller (PIC16F690) these lines are periodically sampled and debounced in a software routine.

The software converts this analogue sample to a BCD and outputs it to a 7447 which converts it to drive the seven segment display device. The microprocessor contains a non-volatile EEPROM memory, so the selection is retained as the last status if the power is removed.

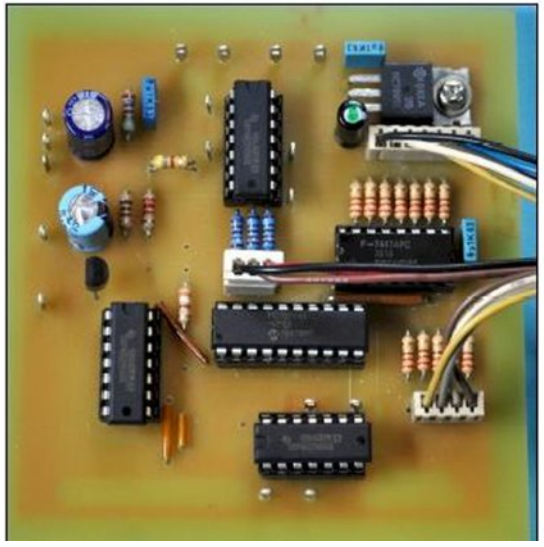
The micro then drives 2 HEF 4066 analogue switching IC's for audio selection and 1 for video selection, Key 0 turns off all the inputs. The # key toggles the mode between it being an 4 audio, 4 video matrix to its other mode which is no audio , but an 8 video input matrix (I.E the 4 audio inputs become video inputs too) this change of use is indicated by the illumination of LED one. The changing of the audio inputs to video is done by E0 E1 E3. And in the 8 video input mode the audio is turned off.

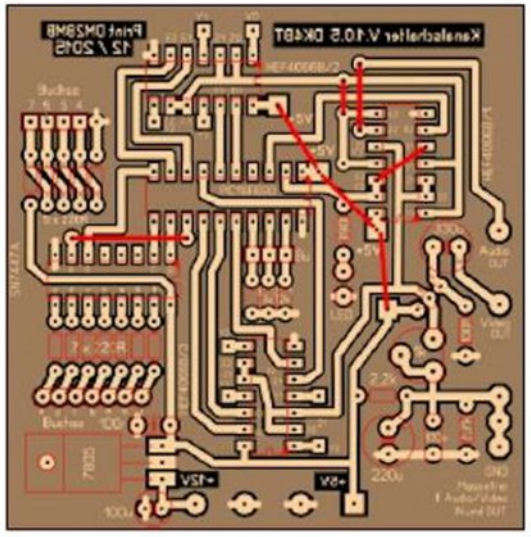
The component values are not critical neither is Transistor T1. Most NPN transistor will be suitable.

Construction was on a single sided PCB and the red lines indicate the wire jumpers required.

Technical specs measured are:-

- *Operating voltage 5.0V floating*
- *Operating Current <200 mA*
- *Peak amplitude of the input signal max. ± 1.5 VSp*
- *Insertion loss Audio (RL = 10 ohms) 0.3 dB*
- *Contact resistance Audio <400 Ohm*
- *Lower limit frequency 0 Hz Audio*
- *Upper frequency Audio> 1 MHz*
- *Video output resistance 100 Ohm*
- *Video input impedance 2 ohms*
- *LRL video (RL = 100 ohms) 10 Hz*
- *Upper frequency 15MHz Video*



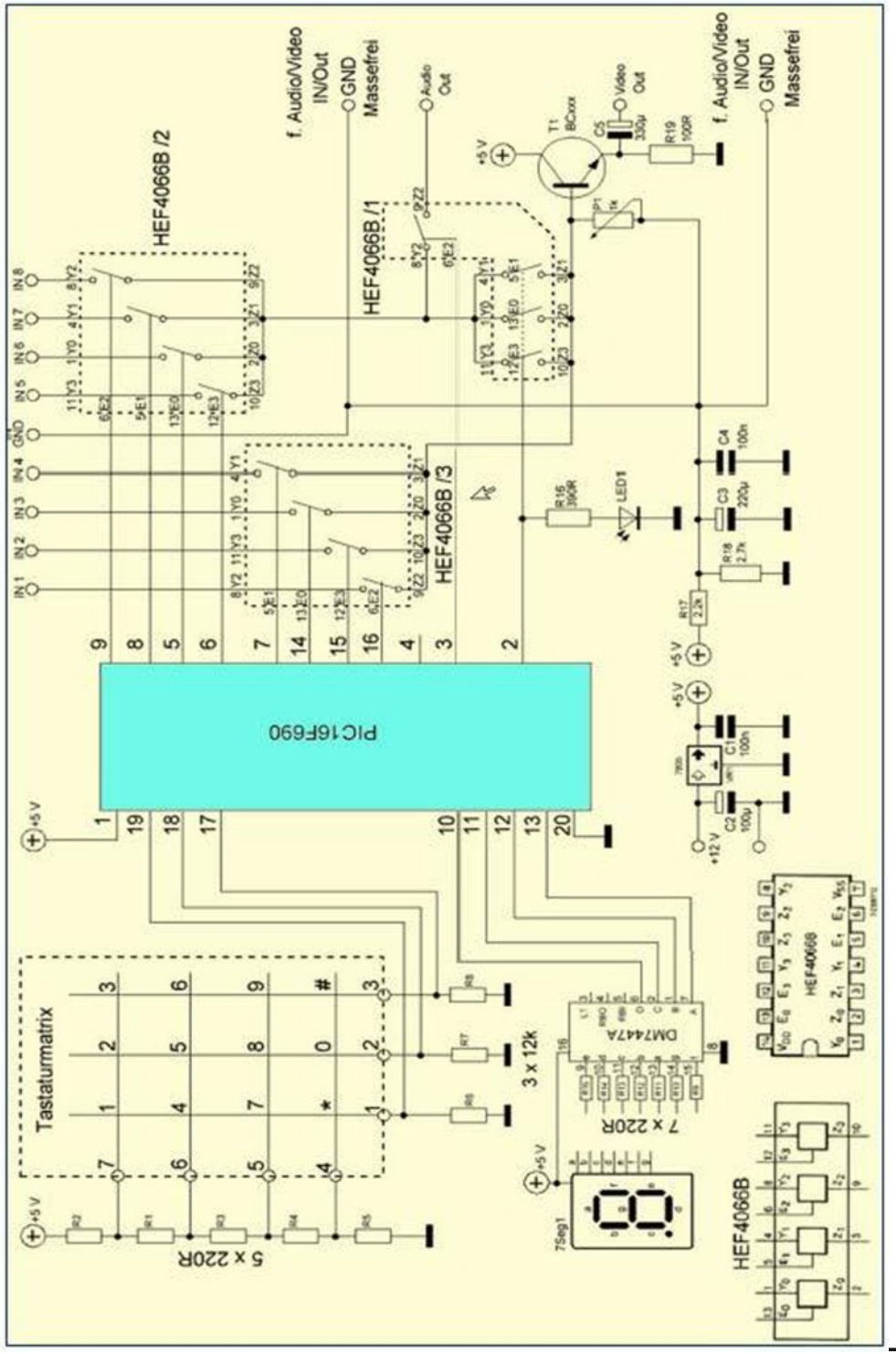


Circuit documents

The idea in the development of this Video switch was a simple but effective device, for easy self build.

All information required for this project, the circuit diagram with the component values, a layout for the single-sided printed circuit board, a detailed description, and software for the mono-set microcontroller as source are in assembler and a HEX file are available from the author.

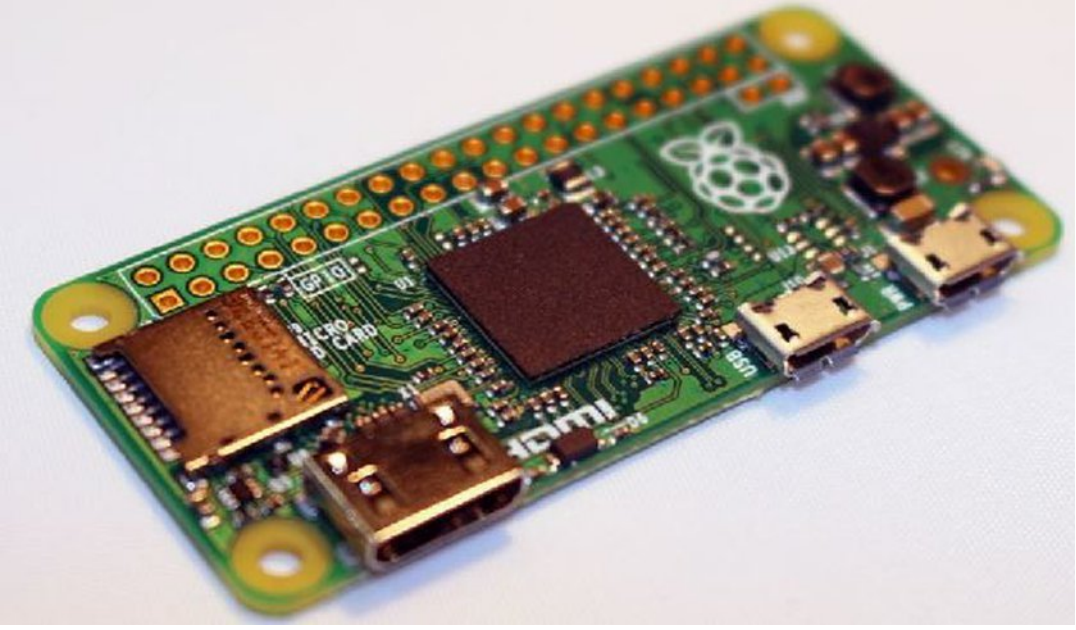
Also, the finished TIG programmed processor is available from the email address *dk4bt@darc.de*



Raspberry Pi Zero - Very Simple Colour Bar Generator

Mike G7GTN

Introduction



The recently released but still at present ultra-rare Raspberry Pi Zero was the perfect module to build a very quick PAL Colour bar generator.

I created two simple bar images and added the facility to be able to add a caption or Callsign by using pushbuttons connected to an additional two I/O (GPIO) Pins.

The fifth button is used to remove this pre-set Caption or Callsign and takes us back to just basic full screen bars. This is a simple beginner type project with plenty of scope for user expansion & additional experimentation.

Connecting PAL Composite video output

On the Zero modules we can populate the standard 2.54mm two way pin header to make our PAL (or NTSC) connection to our required video output source either video monitor or transmission chain. The square around the hole indicates the Video side with the circle being the ground connection.

Next we need to edit our systems boot config.txt file to inform the Operating system what specific standard of composite video output is required and also specify an aspect ratio at the same time, which in my case was 4:3. This is further detailed in the Contest number generator project published in CQ-DATV magazine edition 35 so really that should be a reference to this; additionally this is documented within the code.

Switching the bar images and user captions

The 5 standard push button switches are wired directly to GPIO pins (Figure 1), the other end of each to ground. The software implements pull down resistors on the BCM chipset using the Python GPIO library.

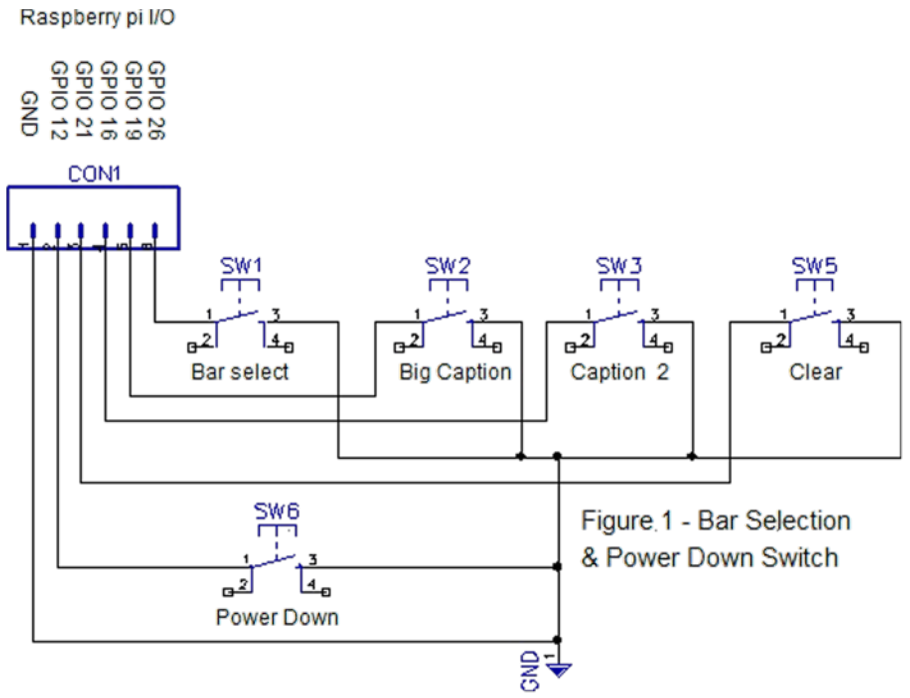


Figure 1 - Bar Selection & Power Down Switch

Caption Configuration

Use is made of the python pygame library to load our colour bar image and add any Callsign or caption text required. The image used is sized at (768X576) pixels.
A sample of the first caption text configuration is shown. You need to make changes to the X & Y locations of the text to suit the size of your required captions.

```
# Small caption
def captiontwo(channel):
    # Calculate these values depending on your own captions length
    # First number is across the screen, next number is down
    ptext.draw("G7GTN - TELEVISION", (73, 346), fontname="mode7", fontsize=56, alpha=0.9, owidth=1, color="white")
    ptext.draw("TALKBACK 144.750MHz", (64, 430), fontname="mode7", fontsize=56, alpha=0.9, owidth=1, color="white")
    pygame.display.flip()
```

The code which includes comprehensive installation instructions is available from the CQ-DATV software page as *BARSCODE.ZIP*

Operation

Pressing the clear button will take you back to full screen bars with no captions being shown. At present we have two styles of bars that your captions can be overlaid on.

The power down button shuts the pi zero down safely to save any Operating System corruption issues from an abrupt forced close.

Additional Note

If you wish to close the running code down you may connect a mouse to the USB port and press either key. This will stop the python interpreter and allow you to continue working on the Zero.

You could also add an additional push button switch if so desired to carry out the same function.

References

- Pygame programming reference material
  http://pygame.org/hifi.html
- Pytext additional text functions
  https://github.com/cosmologicon/pygame-text
- Windows Testcard maker software
  http://www.oodletuz.fsnet.co.uk/soft/tcmaker.htm

My life with Teletext

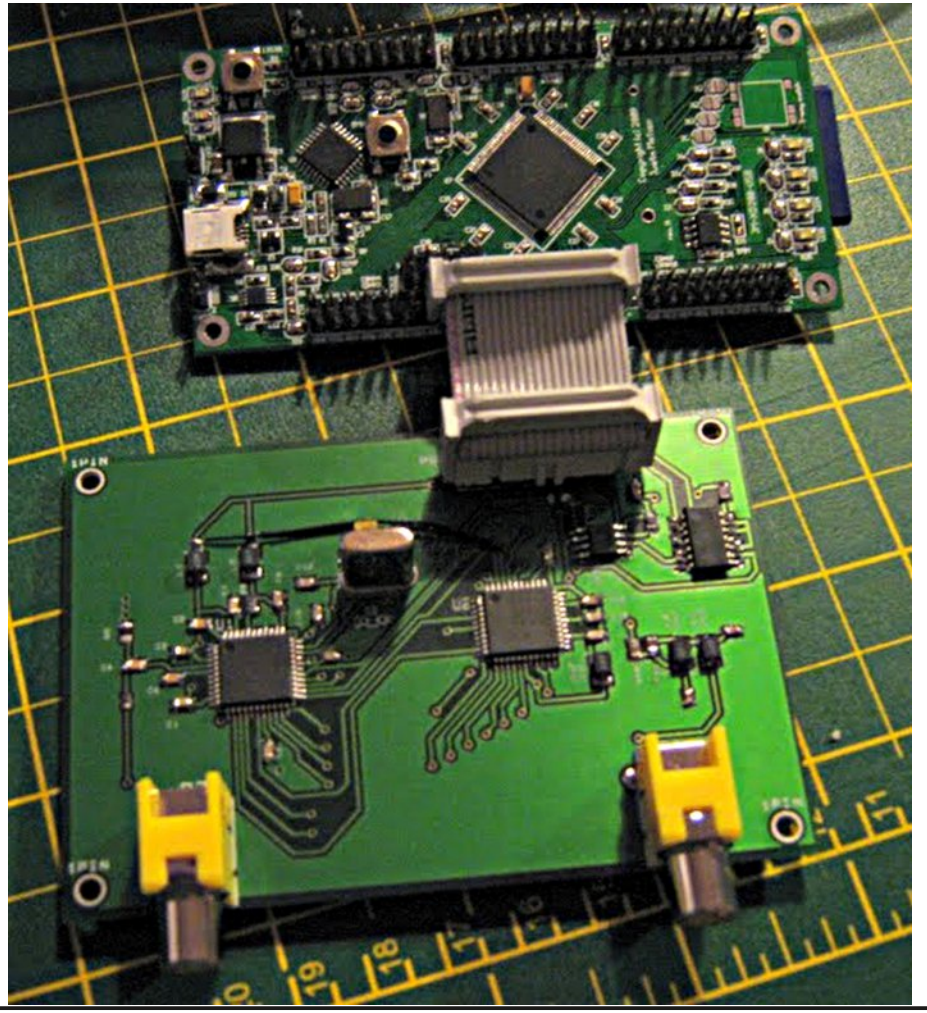
By Peter Kwan

My earliest introduction to teletext was drooling over the circuits in Wireless World. It was a huge complicated project and far beyond what a teenager could build or afford. My second job was at the Moving Picture Company. One of the latest gadgets was the Quantel Paintbox. If you wanted to save your work you could back it up, one picture per 8 inch floppy disk. You can imagine the piles of floppies. One bit of magic was that you could run a backup straight to videotape. This involved the Paintbox outputting full frame teletext at about half a megabyte a second.

Next I moved onto ITN where I animated maps, charts and sport live on air using the extraordinary VT80 machine but that is another story. Our top floor computer graphics office in Noel Street was next to the news part of Oracle. They had three or four workstations each with an oversized keyboard with lots of weird coloured keys. A bunch of PDP-11s ran the show.

On News at Ten I'd often be watching the BBC results teletext page waiting for a midweek soccer result to come in. I'd quickly type in the numbers and rolled the football live when Alistair Burnett came to read that story.

I was fortunate enough to land a job with MRG Systems who made all sorts of teletext equipment. The first job I did was to make the BBC's Programme Delivery Code work more reliably. It took a lot of hacking to make something that sort of worked. A few years later I analysed it to see exactly how it should work and rebuilt the whole thing from scratch. It worked great after that.



Another thing that I worked on was an advertising opt-out system. This would encode special control packets into teletext and send them out with the normal transmissions.

Machines in the regions would decode these messages and pre-roll VTRs and switch video This was so that you could have regional ad breaks.

For example a French language station in Switzerland might transmit to Belgium and France but each country would have its own adverts. This network is still active across Europe.

The biggest system was the BBC's Presfax and Regional Recall systems. Presfax gave exact timings for programmes and links. HUDFax (Head up Display) gave countdowns and showed the next five items in double height text.

Regional recall was a teletext packet that would kill all regional programming and switch everything back to London. If something really big happened then London could take control. I don't think it was ever used.

This was a complete main and reserve chain for BBC One and BBC Two. It took data straight from the scheduling system and transmitted it as teletext to the four nations and twelve regions. This was so that everyone knew what was happening to the nearest 25th of a second. It was decoded and displayed using teletext character generators in each control room.

It was transmitted over air so if you could decode teletext databroadcast IDL-B you could see the schedules too. The switchover to digital did not kill this service. It still runs internally to the BBC even today.

Occasionally I see the system running when they show the interior of the control rooms.

However, I had an idea that the teletext inserters that we made and sold for thousands of pounds could be done in a cheaper way.

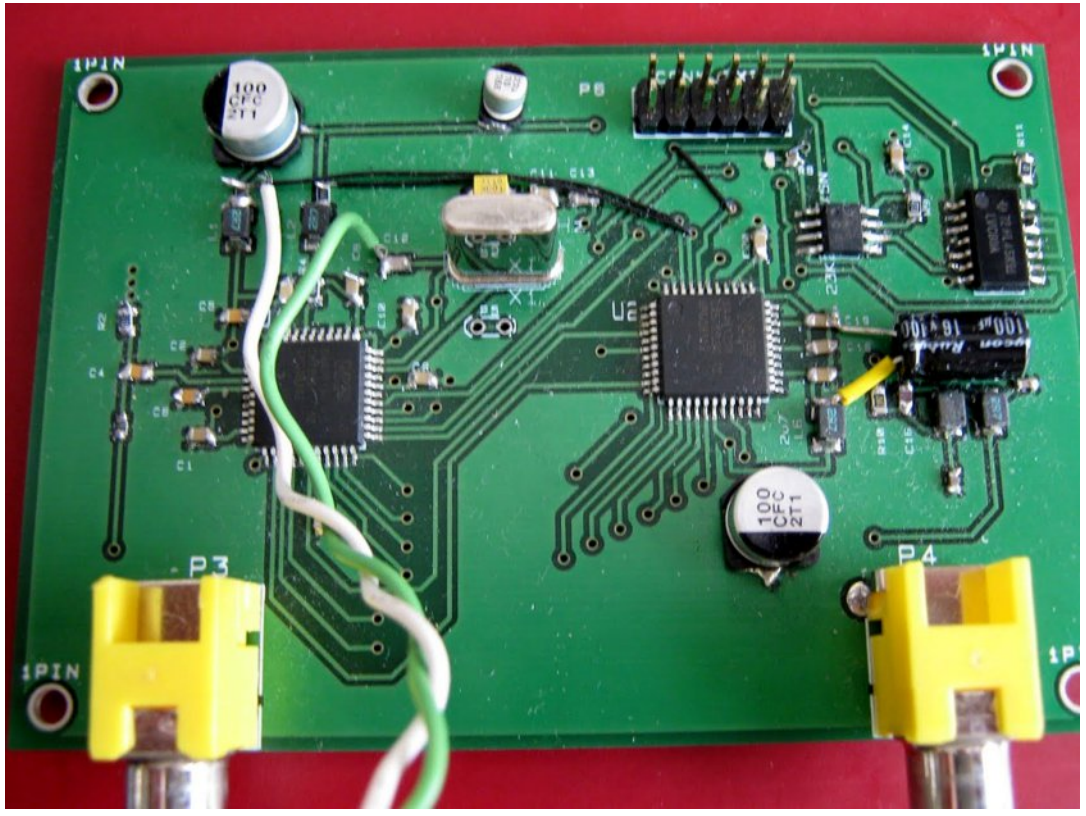
Over one Christmas break I doodled lots of designs and Googled lots of chips. My design evolved until it was down to four chips plus an Atmel AVR controller board.

I was quite proud of re-purposing a 70p serial ram chip to take the place of a £20 FIFO. Once I saw the final design of VBIT I knew I had to build it.

I downloaded Kicad and by the middle of January I had the PCBs in manufacturing. I also had access to SMT tools so I could populate the boards myself.

I wrote a heap of code and much to my amazement I was getting teletext out.

Phase two of VBIT was because the 8-bit Atmel AVR was too small for the task and it needed a lot of hacks to get around the limitations of memory and speed. The next VBIT had similar circuitry but a smaller board and had a convenient ribbon cable and a regulator to interface to the Pi. I rewrote most of the software so that it was split into the teletext stream handling and the hardware video timing. I nearly manufactured 160 of these but it turned out that the interest in the project didn't match the orders. I ended up making a dozen.

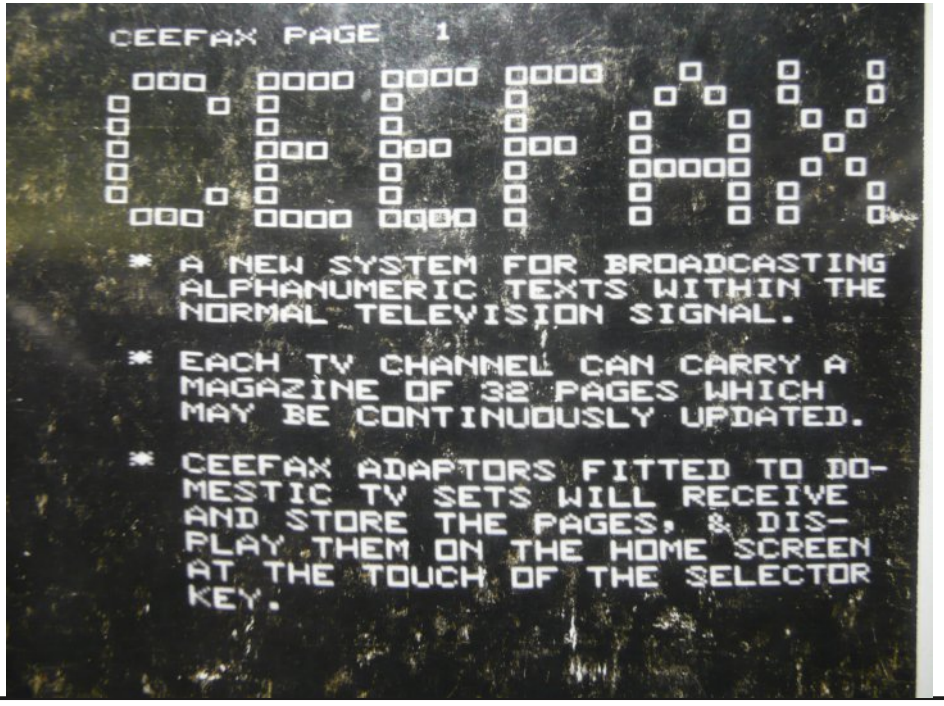


Then analogue switch off happened and I was out of a job. It was then that I wrote the teletext editor wxTED because I thought that having current Windows GUI experience might be helpful in getting a job. While on my break from work something amazing happened.

Alistair Buxton had been moving on a separate path towards the same goal of creating affordable teletext. He had designed an AVR teletext generator of such ingenuity that it only used three cheap chips and in a most ingenious way. Then he excelled himself again and whittled it down to NO chips by using the Pi's on board video. Much to his credit, his software could accept data piped into it. This meant that I could take my teletext stream and instead of pumping it into the FIFO I could send it directly to Alistair's video driver and so VBIT-Pi was born.

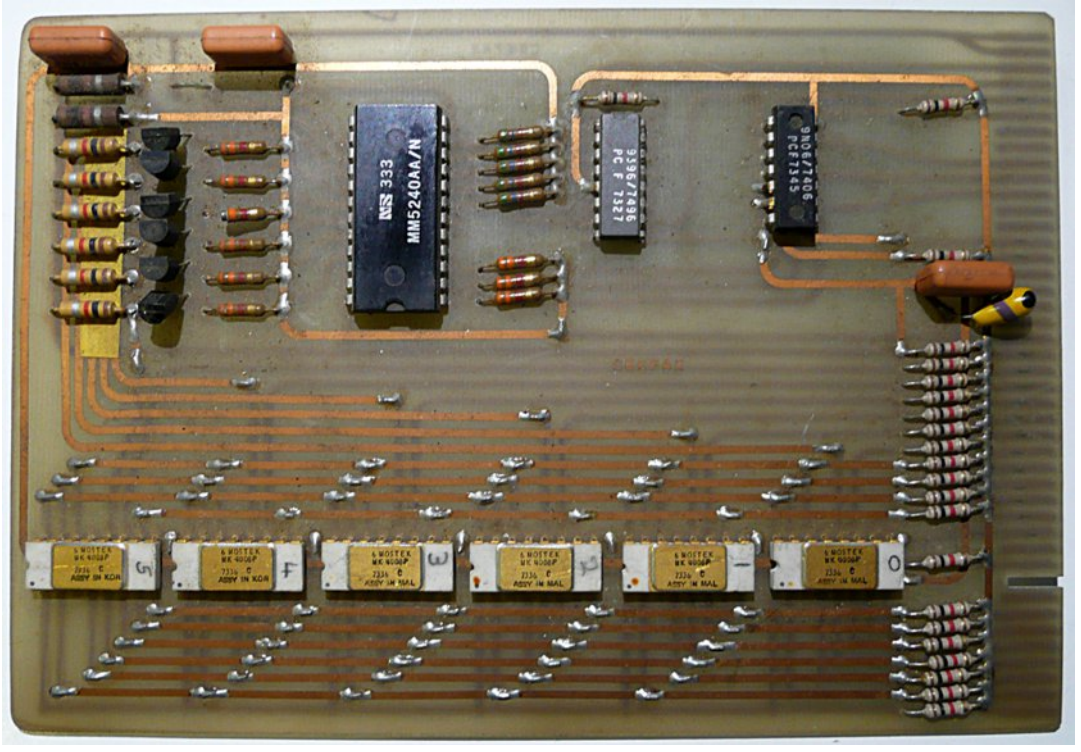
You'll find me active at "Teletext-The Facebook Group" or @PeterKVT80 on Twitter. If anyone wants to show off their teletext page designs then please join the Facebook group. The group would really appreciate that. Currently I am working on a teletext viewer that works in a browser and will also combine an editor. It doesn't have a domain yet but work is in progress at *http://23.251.131.26:8080/*

Alan Critchley comments



This brings back memories. Circa 1973 when the BBC were sending experimental transmissions from Winter Hill my boss got me a copy of the spec and I built a decoder - about 42 TTL chips I think + memory and character rom.

This could only do upper case as I could only afford six 1K x 1 bit dynamic memory chips, they were over £7 each - about a weeks wage I think for the six. Those were the days. I have some recordings on 8in spools of 1/2in tape and the old Shibaden VCR but the tapes have deteriorated and the VCR hasn't run for 40 years so don't think we can recover those.



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If you are sending a construction project, please include the dimensions of any pcb's and make the pcb image black and white, not greyscale.

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