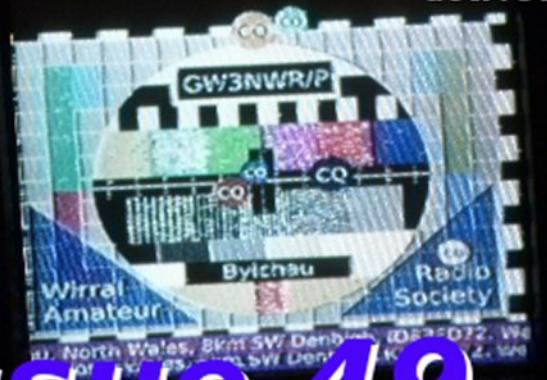


CQ-DATV

dotMOBI



Issue 49 - July 2017



<http://cq-datv.mobi>

ISSN 2059-2191

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Production Team

Ian Pawson G8IQU Trevor Brown G8CJS
Terry Mowles VK5TM

Contributing Authors

John Hudson G3RFL
Ken Konechy W6HHC

Yes it is nostalgia time.

Some of you may be old enough to remember the transmitters utilizing gunn diodes (a semiconductor electronic component, with negative resistance of the 70's.

These transmitters were in large part spin off's from the Soflan motion detectors with horn aerials and the gunn diode in a complete package, these motion detectors seemed to be at every rally stall, but alas dried up some years ago. If you modulated the power rail with a video signal they made excellent low power 10GHz TV transmitters.

The receivers were a little more complex in that you required a way of mixing the signal down to an IF frequency often around 50 to 100 MHz and then an FM IF strip and detector to recover the signal. But fortunately these units were soon followed on the same stalls by FM TV receivers for Satellite TV using KU band LNB's that could in some cases, be converted to 10GHz with a change of Puck. This did not work for all LNB's as some had rather selective filters in the front end.

The Marconi blue capped LNB marked the start of this technology in the UK. Now a new motion detector is here the HB100 and they are moving around on EBay for just a few UK pounds and outperform the old gunn diode technology in both power and stability, alas they don't come complete with antenna, but John G3RFL is on the case.

In the last issue he used one as part of a frequency counter and in this issue has pressed one into service as an FM-TV transmitter. It would seem others are on the same wavelength so as to speak, with dish feeds and horns and even a lamp shade aerial to really get some DX capability out of these inexpensive units.

Talking dish feeds, does anyone remember the penny feed which was a way of illuminating a dish from a WG 16 wave-guide, well that UK coin long since passed into obsolescence and due to the poor design of the Euro, we are reliably informed it is not a direct replacement due to a lack of foresight at the European Central Bank.

While on the memorabilia trail, our Facebook site CQ-DATV has had one or two outpourings on the old 1980's TV handbook written by our very own Trevor assisted John Wood (<http://cq-datv.mobi/handbook.php>), like all books the circuits date and chips become obsolete, but interesting to see the technology of the times which does have a habit of spawning new ideas. The TV handbook was part of a series of several books from TV compendium and Micro and TV projects, which only existed in print format, but never the less they do exist and if you would like to see more of the same we could investigate getting the rest of the series scanned and available for electronic download.

Staying with the RF side of things, Ken W6HCC has updated his TV DX contact list and presented it in this issues. Nice to see that ATV is still alive and populating our airways and the path lengths that can be achieved. Ken has also sent in his DATV express May edition report, so plenty to read up on.

Just so our magazine is balanced as we know you don't all engage in RF transmissions due to low QTH's and 20 degree gardens we have our usual Micro Corner and this time its Mike G7GTN's turn to add to our growing internet repeater using the Node MCU module and its BASIC programming.

Trevor kicked it off with control via I2C of the Transmitter on off controls, cross point switching and a rotatable receive aerial and this time Mike has added audio idents, well you did not expect Morse code did you, this is the 21st century and you can only push nostalgia so far, so its speech idents.

It may have escaped your attention that this is CQ-DATV issue 49 and the next edition CQ-DATV will mark 50 issues (half way to our centenary issue).

With more than a quarter of a million total downloads, we feel we are supporting the ATV community worldwide!

But it might not have escaped your attention that this demand is being fed by some very familiar faces and we would like to see some CQ-DATV contributions from other readers, even if it is just a photograph of your shack or something you built that did not perform and we could help with.

Let's see if we can celebrate our half century with a bumper issue. As usual all copy to editor@cq-datv.mobi.

Please sit back and enjoy CQ-DATV 49.

CQ-DATV Production team

Please note:

Due to a lack of 'elbow grease', the Micro Corner article has had to be held over to the next issue.

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.



2017 ARRL/TAPR Digital Communications Conference

September 15-17
St Louis, Missouri

Make your reservations now for three days of learning and enjoyment at the Holiday Inn Airport West in the St. Louis suburb of Earth City. The Digital Communications Conference schedule includes technical and introductory forums, demonstrations, a Saturday evening banquet and an in-depth Sunday seminar. This conference is for everyone with an interest in digital communications — beginner to expert.

Call Tucson Amateur Packet Radio at: **972-671-8277**, or go online to www.tapr.org/dcc

The poster features a night view of the St. Louis skyline with the Gateway Arch prominently displayed. Overlaid on the image are the logos for ARRL (a diamond shape with 'ARRL' inside) and TAPR (a stylized 'T' with 'TAPR' next to it).



Broken record!

Hams in England have broken the 200km distance record using 146 MHz RB-DATV.

Known Digital-ATV DX Records - Page 1			
updated 2017-06-01			
by Ken WBHHC			
24 GHz			
124 KM	JA6DME & JA6EES	2011-11-12	Locations Mont Ten Zan and Mont Ge Zan
10 GHz			
450 KM	HB9JBC & F4CXQ	2005-06-21	Locations JN40CT (Sardinia) and JN120H (Spain)
93 KM	G8GKQ & G8GTZ	2016-07-05	H.264 video - DVB-S protocol at 333 KSymbs FEC=7/8. G8GKQ used RPI and DigiThin at 250 mW. G8GTZ used PIPO and DATV-Express at 3W. Locations IO80WP (Povington Hill near Lutworth) and IO91GI (Walbury Hill)
32 KM	G8GKQ & G8GTZ	2016-06-23	H.264 video - DVB-S protocol at 333 KSymbs FEC=7/8. G8GKQ used RPI and DigiThin at 200 mW. G8GTZ used PIPO and DATV-Express at 5W. Locations IO91JA (Lane End) and IO91JH (Hamington)
5.7 GHz			
341 KM	JL1BLF & JH1GED	2011-08-06	Locations Mont Chokai-san and Mont Kashimayari-gatake
2.4 GHz			
~ 1000 KM	OR4ISS to IO9KPT (one-way)	2014-03-08	
~ 1000 KM	OR4ISS to IK1SLD (one-way)	2014-03-08	
Initial DVB-S protocol live video transmissions from HamTV in orbit aboard ISS SR = 1.34 MSymbs/sec and 2.0 MSymbs/sec using SR-Systems exciter & MPEG2 Locations Orbit to Matera, Italy and also Orbit to Casale Monferrato, Italy			
252 KM	JA6SPI & JA5MFY	2009-11-03	Locations ??
1.2 GHz			
440 KM	G4KLB & G1LPS	2010-10-11	Locations IO90BR and IO94EQ (tropospheric ducting - one-way DATV)
419 KM	G4KLB & M0DTS	2010-10-11	Locations Bourne mouth, England and Yarm, England (tropospheric ducting)
379 KM	VK3RTV(RPTR) & VK7EM	2011-02-23	Locations Mount Dandenong, Victoria and Penguin, Tasmania (operators VK3BFG, VK3DQ, VK3WWW and VK3TRX)
252 KM	JA5GYU & JA6JNR	2009-11-03	(1 Watt)
70 CM			
696 KM	F1FY to G8GTZ	2013-09-24	(DVB-S 2MS/sec FEC=1/2 - one way reception)
696 KM	G8GTZ to F1FY	2013-09-25	(DVB-S 2MS/sec FEC=1/2 - one way reception reported by FM) Locations IO91KH (near Basingstoke) and JN16VB (near Roanne, France)

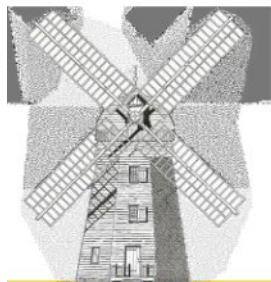
See more details at www.von-info.ch/hb9afo/recoords/recoords.htm

Known Digital-ATV DX Records - Page 2			
updated 2017-06-01			
by Ken WBHHC			
70 CM -continued			
600 KM	DB9TAN (repeater) to F9ZG	2014-11-28	DVB-S - one-way DATV - Tropospheric ducting (signal 25 dB S/N over ca) Locations Wasserluppe (Hesse state, Germany) to IN99KC (Normandy, France)
528 KM	G3PYB & F5AGO	2013-09-24	(DVB-S 2MS/sec) Locations near WYORKSHIRE and JN08DP (near Poitiers, France)
501 KM	W4HTB & WB8LGA	2014-07-26	(DVB-T QPSK FEC=1/2 2 MHz Bandwidth) - Tropospheric ducting Locations Bowling Green, KY and Marengo, OH
235 KM	G8GTZ & F9ZG	2016-06-12	H.264 video - DVB-S protocol at 125 KSymbs using DATV-Express w/ 19-ele yagi Locations JO00HU (Fairlight near Hastings) and IN99KC (near Cherbourg)
121 KM	KH6HTV to K0RZ	2011-11-21	(video resolution HDTV 1080i - protocol ITU-T/J.83B QAM-64 - one-way DATV) Locations Cheyenne, Wyoming and Boulder, Colorado
146 MHz			
294 KM	G0MUWA & G8LES	12/29/2016	tropo-ducting - H.264 video - DVB-S protocol at 125 KSymbs with DATV-Express and 9-ele yagi at G0MUW. G8LES also used DATV-Express with 10-ele X-yagi. Both produced 25W ERP. - on 146.5 MHz - UK temporary band allocation Locations IO83RO (Winter Hill) and IO91LC (Four Marks)
281 KM	G8GTZ & G0MUWA	12/29/2016	tropo-ducting - H.264 video - DVB-S protocol at 125 KSymbs with DATV-Express and 9-ele yagi at G8GTZ. G0MUW also used DATV-Express with 9-ele yagi. Both produced 25W ERP. - on 146.5 MHz - UK temporary band allocation Locations IO91KF (near Basingstoke) and IO83RO (Winter Hill)
237 KM	F3YX to F9ZG	2011-11-09	DVB-S protocol at 1000 KSymbs using modified SR-Sys MinMOD (one-way) on 145.0 MHz experimental license 5-Minute max Locations JN18AP (near Limours, France) to IN99KC (near Cherbourg, France)
195 KM	GW8VPG & G8GTZ	2016-12-11	DVB-S/H.264-video protocol at 333 KS/s - GW8VPG using DATV-Express w/ 9-ele G8GTZ also used DATV-Express w/ 9-ele yagi on 146.5 MHz - UK temporary band allocation Locations IO81LS (Blonange Mountain in South Wales) and IO90UO (Isle of Wight)
50 KM	M0DTS & G1LPS	2015-02-21	H.264 video - protocol DVB-S at 333 KSymbs using experimental DATV-Express on 146.5 MHz - UK temporary band allocation Locations North York Moors, England and Spennymoor (County Durham), Eng
50 MHz			
64 KM	G8ADM to G8LES	2015-02-10	DVB-S protocol at 1.133 MSymbs/Sec with FEC=3/4 (one-way) on 51.2 MHz using 200W avg Pwr Out and BW approx 1.5 MHz Locations North of Harrow (IO91TO) to North of Alton in Hampshire



In dit nummer:

- ◊ Red Pitaya –Hamlab
- ◊ Zelfbouw FH-2 – Remote control voor YAESU
- ◊ Een FUN-stukje door PA9JOO/P
- ◊ De nieuwe 'Syncsmurf 2'!
- ◊ En nog heel veel meer, totaal 65 pagina's



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April 2017 editie 32

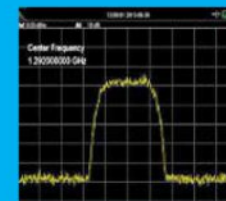
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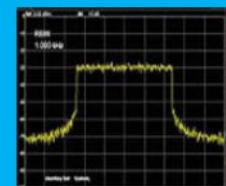


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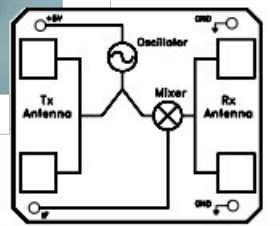
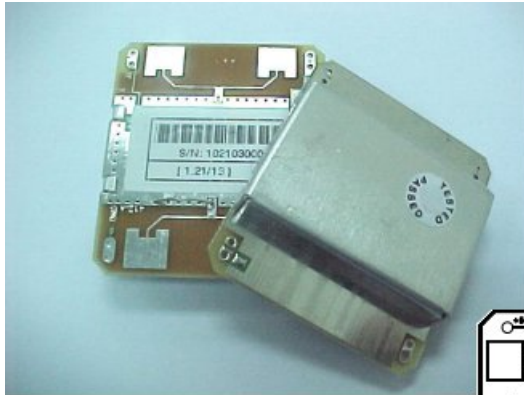
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the PURCHASE page



An FM TV Transmitter using the HB100

By John Hudson G3RFL

In CQ-DATV 48 (<http://cq-datv.mobi/48.php>), we looked at the HB100 10GHz exciter that is used as an inexpensive door radar to detect people and open the door. For this issue I thought we would have a look at pressing one into use as a 10GHz FM TV transmitter.

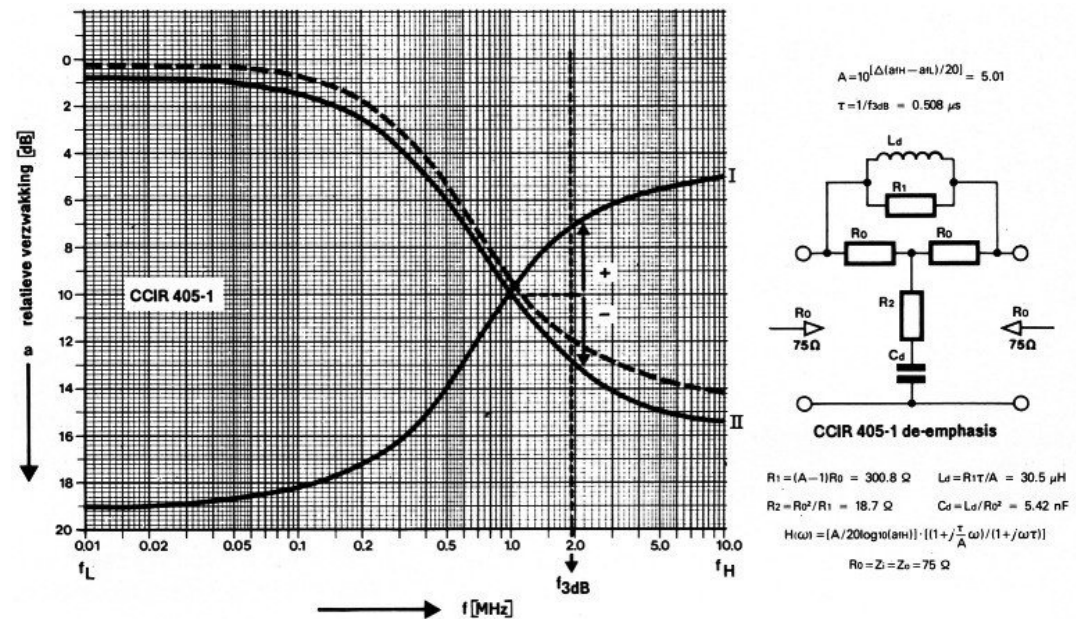


The HB 100 radar unit

The way to FM modulate these units it modulate the power rail supplying the oscillator rather like we used to do for Gunn Diodes. This modulator design was originally developed for such a purpose.

The video is first passed through a CCIR 405 pre-emphasis network that reduces the low frequencies so that the higher frequencies deliver more modulation and hence more power into the FM side bands, to combat chroma noise, a well documented FM TV problem.

CCIR 405 de emphasis is part of all FM TV receivers, so if we get the pre emphasis cure correct, then the de-emphasis cure



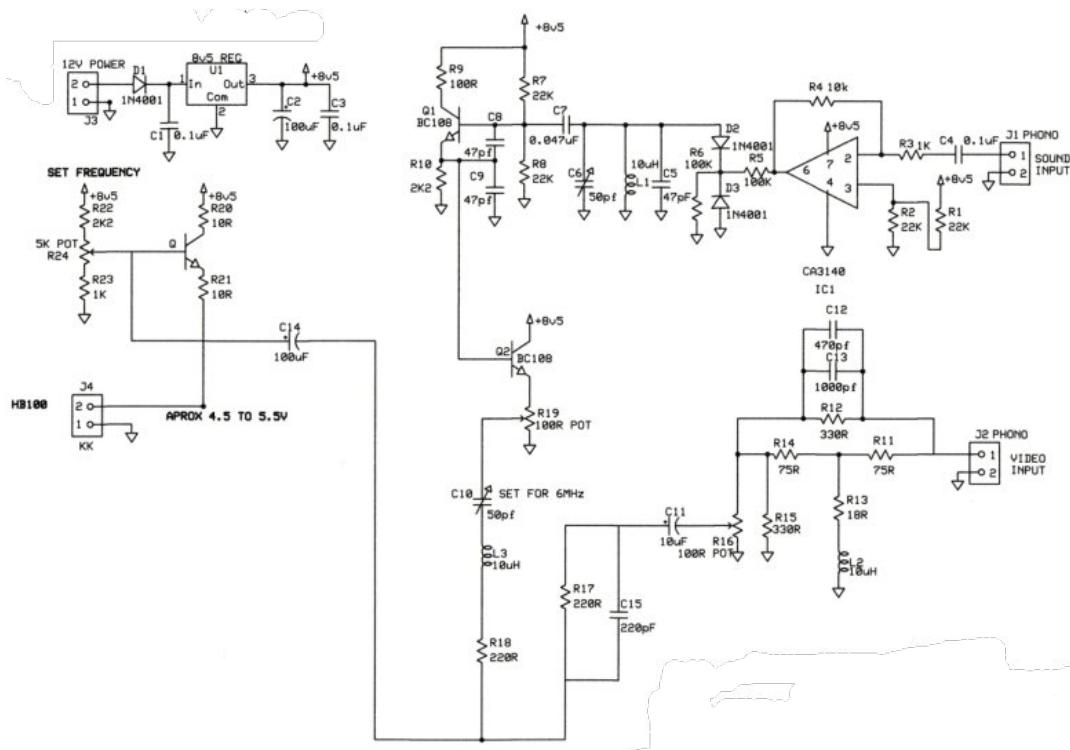
FM CCIR 405 pre and de-emphasis

will present a flat video response, with a reduced chroma noise level than flat response modulation would deliver through an FM modulated transmitter -receiver chain.

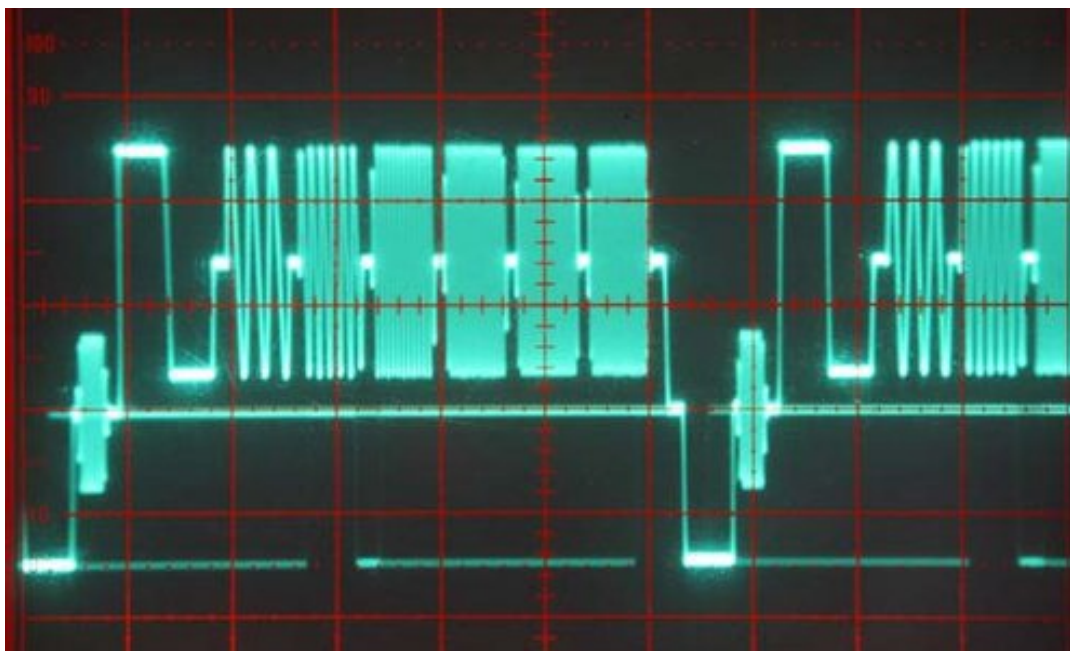
Audio is applied to a simple CA3140 op amp which has a stage gain of 10, set by R3 R4 to ?????? and then used to modulate Q1 (BC108) sound sub-carrier oscillator by driving two 1n4001 diodes which are behaving as variable capacitors.

The oscillator is set to 6MHZ by C5 C6 and L1. The video and audio sub-carrier are then combined to modulate a BC547 which provides the necessary current gain required to drive the HB 100 which draws about 30mA from a 5 volt supply, R24 provides fine tuning of the HB100 frequency, by adjusting the voltage that is video and audio modulated..

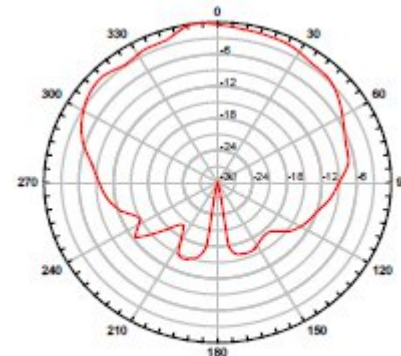
Having now tamed the HB100, got it on frequency and managed to video modulate it, the next stage has to be interfacing it to a suitable aerial.



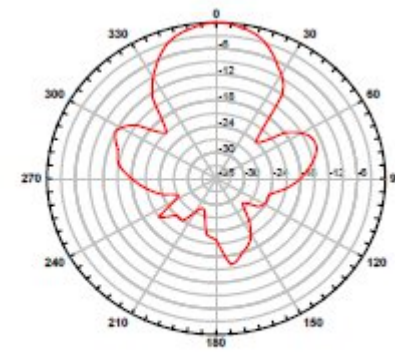
HB 100 Video Modulator



Research took me to <http://f6hcc.free.fr/10ghz.htm> and Jean's work, where he placed the unit at the focus of 60 centimetres offset dish. The HB100 module "illuminates" the full surface of the parabola and the gain is high (about 30 dB). Having done much work with dishes, it is important to illuminate the full surface of the dish and not over illuminate where power is wasted.



Azimuth



Elevation

RF Polar diagrams for the bare HM100 unfortunately not a perfect cone but for a small shallow dish requiring 120° might get a reasonable illumination.

But there were other solutions on the net and this elegant solution by Peter PA1SDB uses an IKEA lamp shade which just happens to be a parabola.

The HB100 was placed with the two transmitting antennas in the dish of a dish because the antennae are on the edge of the HB100 print.

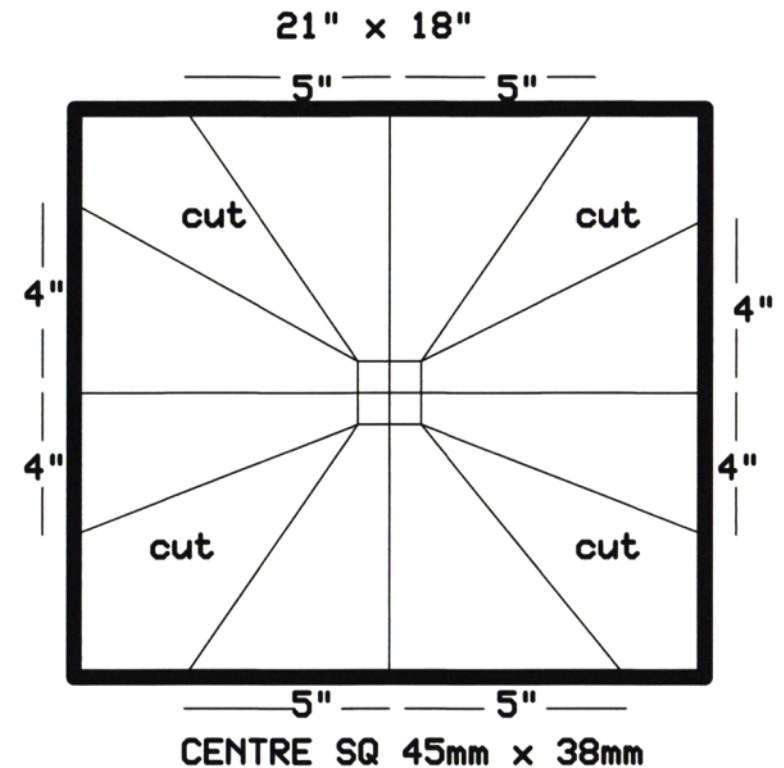
The maximum radiation, the focus point, was found by measuring the field strength at a distance of 8M with a 1N23C diode detector.

Left: Test Signal having passed through CCIR 405 pre and de-emphasis



Another problem is that the dish also focuses the sun light and heat onto the centre and mounting sensitive electronic equipment there and also equipment, like the HB 100 that can change frequency with heat can be a problem. You might have guessed it's June and we have had a couple of warm days in the UK with a forecast of more to come and I am in a reflective mood over a cold beer in the garden.

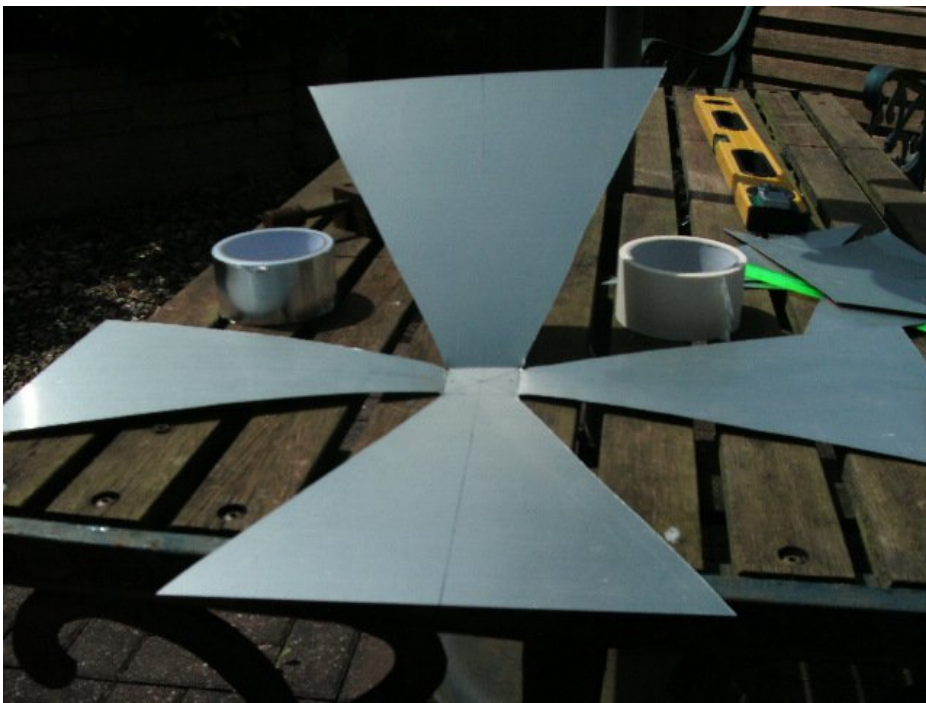
So to try and bring something new to the party, I opted for a horn antenna. This was cut out of a simple piece of 22 SWG aluminium purchased from PlumbBase.



Above: Horn template

Above left: Jean F6HCC's solution might also need a little weather proofing

Left: PA1SDB's centre fed IKEA Lampshade



The cut out horn

Once I cut out the shape in my carefully calculated template, it was a simple fold into the horn, my geometry seemed to work and the basic horn took shape.

It then needs the edges sealing together, never the simplest of operations for small units. I have soldered them together in the past, yes you can solder to aluminium.

You need to clean the joint well, immerse the job in an oil bath, scrape the surfaces again and then solder them while still immersed in the oil bath. You need a powerful soldering iron, that delivers plenty of heat, as the oil bath has a cooling effect. For this task I was clearly going to have to come up with a different solution.

I went for gaffer tape for the strength and lined the inner joints with silver window alarm tape, something I might revisit later.



Johns prototype HB100 Horn

The last problem was interfacing the horn.

I did consider connecting a semi rigid coax to the HB100 and then using the other end to fashion a wave guide probe for adding to the horn, but for the time being I mounted the HB100 inside the HORN on two bolts.

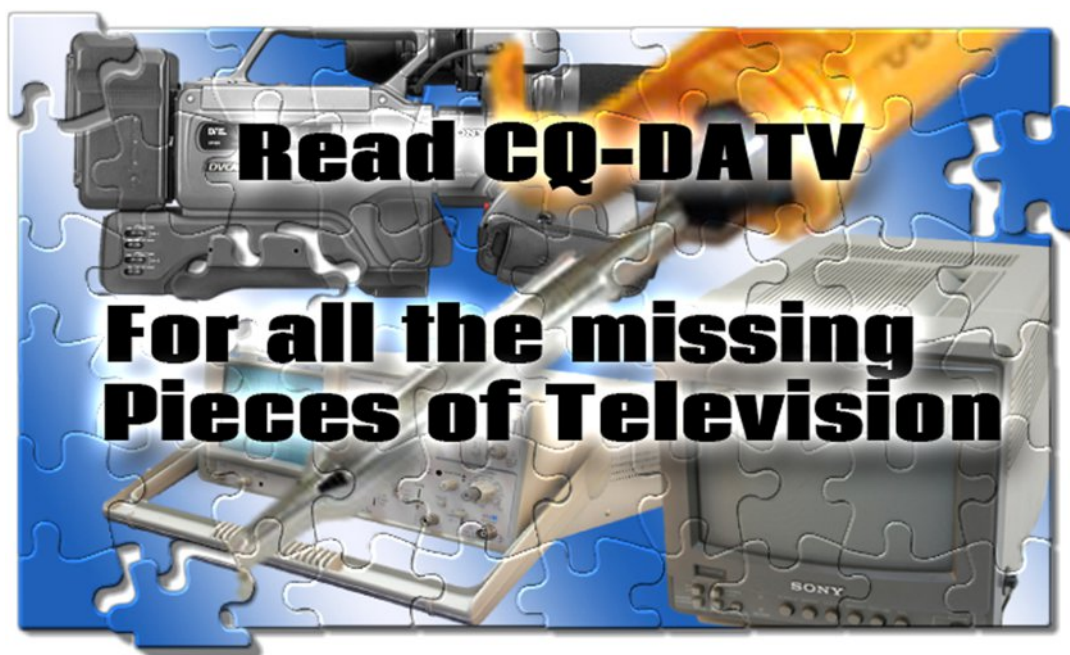
I did not cut the horn out just drilled two holes so I could run some gain measurements which were a little disappointing in that I initially measured a gain of 10dB and this had side lobes, but 20dB down.

So perhaps the dish solution might be the way to go as it delivered a 20dB improvement over my simple horn.

Watch this space!



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Im Heft: Einladung und aktuelle Informationen zur
 AGAF-Jahreshauptversammlung am 6. Mai in Glövizin



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CQ-DATV NEEDS YOU!

Without reader input CQ-DATV would be an empty ePub/PDF file (which I don't think many people would find particularly interesting). We are always looking for articles, reports, anything! Even small things like letters and desktop screens help fill the magazine.

Guidelines

The single rule for an article is that it must somehow be linked to ATV or one of its many derivatives, CCTV, repeaters, aerials/dishes etc.

Write your article in whichever software you choose. I would recommend LibreOffice (this is cross platform). But please spell and grammar-check it!

Writing



There is no word limit for articles, but be advised that long articles may be split across several issues. In your article, please indicate where you would like a particular image to be placed. We will try to adhere to this, but page layout may require us to move them around a bit. Please do not use any formatting in your document.

Images



Images should be the best resolution possible and in PNG format (preferred), or JPG with low compression. Images can be embedded in the document to show their position, but must also be included as separate image files (PNG or JPG).

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Back issues are here:-
<http://www.cq-datv.mobi/ebooks.php>

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Sorry, we do not pay, CQ-DATV is a free magazine. Your reward is seeing something you created in print and knowing you contributed to the ATV community around the world.

When you are ready to submit your article, please email it to:
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DATV-Express Project - May update report

By Ken W6HHC

The DATV-Express project team has officially slowed down to “back-burner” mode.

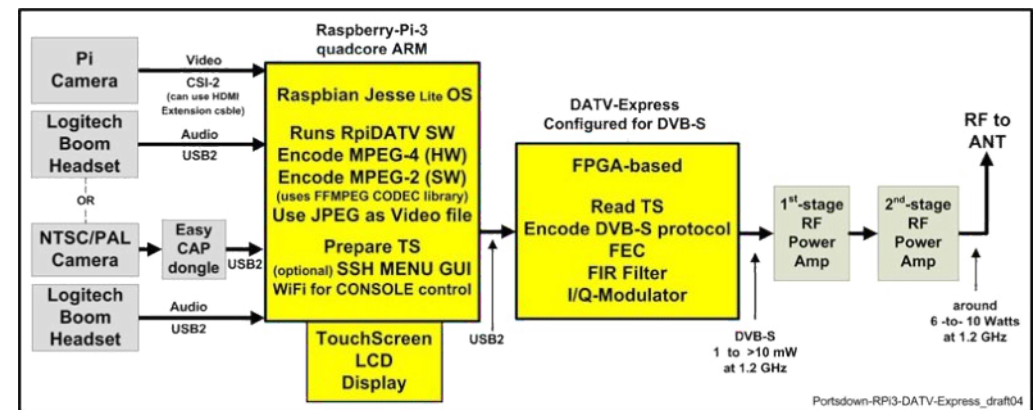
Art WA8RMC reported increased attendance (maybe 150 hams) for the ATV forum sessions at the recent “Dayton Ham-vention” at the new location in Zena Ohio (right next door to Wright Patterson Air Base). Art reports good inventory on the DATV-Express boards.

Ken W6HHC continues to test-and-learn the terrific DVB-S DATV exciter Portsdown Project that is based around RPi-3 and the RpiDATV software of Evariste F5OEO (modified by BATC Portsdown team). Ken’s test set-up is using the (optional) DATV-Express board as the modulator (instead of the normal Portsdown modulator board). Ken has succeeded in transmitting video:

- MPEG-2 encoding with Pi-CAM
- H.264 encoding with Pi-CAM
- H.264 encoding with NTSC camera via EasyCAP video capture
- Test patterns via JPEG file

Charles continues to take a break from the DATV-Express efforts and is involved with with the team working on the USA Phase 4B geosync satellite project that will use DVB-S2X protocol primarily for data transmission of voice, JPEGs, and TCP-IP. Charles mentioned that there is no announced launch date for the Phase 4B satellite, yet.

Future DATV-Express Project Reports are expected to be quite short for the rest of 2017.



Block Diagram of Portsdown/RPi-3/DATV-Express using either Pi-CAM or EasyCAP or even JPEG file as video source

“Project speed set to back-burner”....de Ken W6HHC



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But if you have a Kindle 3G then yes, but only to Amazon, and there is not a lot of ATV material on their site. Smart phone reading apps are ok providing that you have a 3G data connection.

Note: These links will fire up your devices browser and if you are using 3G/4G then you will incur data usages charges.

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CQ-DATV welcomes contributions from our readers. It does not necessarily have to be on ATV, as long as it is of interest to our readers.

Although a formatted article showing the layout can be sent, we prefer an unformatted text file of the script, along with annotations of where important images should be placed. All images should be identified as Fig 1 etc and sent seperately.

Images should be in PNG format if possible and the best quality available. Do not resize or compress images, we will do all the rework necessary to publish them.

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.

CQ-DATV reserves the right to redraw any schematics and pcb layouts to meet our standards.

Coming up in CQ-DATV

Is this the latest issue of CQ-DATV? [Click here](#) to go to our web site to check to see if there is a later edition available.

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