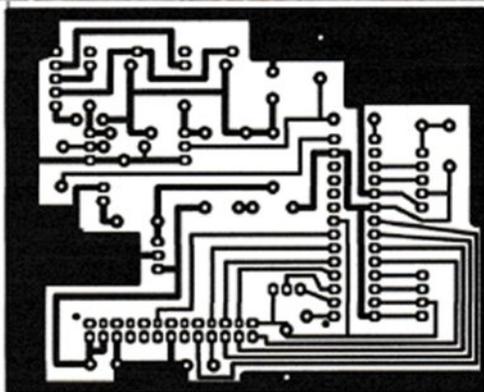
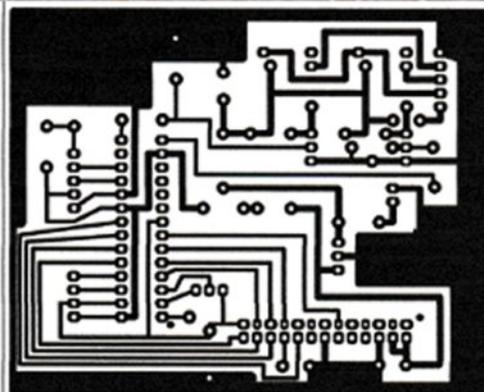


# CQ-DATV



dotMOBI



Component side  
<http://cq-datv.mobi>

Copper side  
ISSN 2059-2191

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## *Production Team*

Ian Pawson - G81QU    Trevor Brown - G8CJS  
Terry Mowles - VK5TM

## *Contributing Authors*

Trevor Brown G8CJS  
Ken Konechy W6HHC

John Hudson G3RFL  
Mike Stevens G7GTN

So we have passed our third birthday and can start looking at what we want to achieve in year four. Although we are as topical as a magazine can get, we are limited by only appearing every month, but the gaps between production are we hope filled by our Facebook page which has a growing number of friends and visitors and of course there is the DATV group

<https://groups.yahoo.com/neo/groups/DigitalATV/info>

Things that often work better in Magazines are the constructional articles and John our resident Construction Guru has put together another project, this time it is an Antenna direction indicator with a TFT screen display, using in expensive components, that John has sourced from the Internet.

We are also looking at H265 coding and if it will deliver any advantages for DATV H.265 supports HD video very efficiently and has almost twice compression of H264, but the latency is much longer than H.264. because it looks forward at more video frames, it is very also processing intensive.

Trevor has been looking again at bridge cameras and this time he is exploring the still side of it capabilities and the advantages and disadvantages of flash lighting.

February also so our first school ATV contact with Tim Peake GB1SS & Royal Masonic School for Girls, UK. GB1RMS  
<https://www.youtube.com/watch?v=KAMKAaSB4Mc>

Tim also sent a message to the staff of the Perth Royal Infirmary for taking care of his mother-in-Law (I bet that picture is framed and hanging in the hospital)

<http://www.bbc.co.uk/news/uk-scotland-tayside-central-35578594>



It's all far cry from the 1950's pictures of Matilda we covered in the last issue, but good to see that ATV is receiving main stream news coverage in 2016 as it did back in the Matilda days.

CQ-DATV Production team

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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.



STM students designing antenna to receive data from STMsat-1 Credit: STM

### HamTV school contact – a world first!

Thursday 11th February 2016, at 18:11 UTC, an educational ARISS radio contact took place at the Royal Masonic School for Girls, Rickmansworth, United Kingdom. The school contact was operated by Tim Peake, KG5BVI in the frame of the Principia mission.

It was a historic event: the radio contact was enhanced with video! Tim Peake activated the Ham Video transmitter on board Columbus.

As far back as the year 2000, a proposal for an ATV system on the International Space Station was submitted to the

ARISS Project Selection and Use Committee by Graham Shirville G3VZV.

November 2002, a request for amateur radio facilities on the then under construction Columbus module was submitted by Gaston Bertels, ON4WF to Mr Jörg Feustel-Büechl, Director of Manned Spaceflight and Microgravity Directorate of the European Space Agency (ESA).

The request was to install wideband amateur radio antennas on the nadir of Columbus, facing the earth. With such antennas, the on board amateur radio facilities could be extended to amateur TV.

In 2003 the request was examined in detail and finally accepted. ARISS would pay for the development, manufacturing and qualification of the antennas. ESA would support the installation cost.

ARISS-Europe started a funding campaign, all donations being published on the website.

In 2004 coaxial feed throughs were installed on the port cone of Columbus. This was needed for accessing the antennas with feedlines from inside the module.

In 2005, the Royal Belgian Amateur Radio Society (UBA) signed a contract with the Wroclaw University of Technology, Poland for the development and manufacturing of the antennas. Whereas initial plans were for UHF, L-band and S-band antennas, only L- and S-band antennas could be ordered by lack of funding. The cost of the project was 47.000 Euro.

Early 2006 the antennas were delivered to ESA. Meanwhile main Columbus contractor EADS and subcontractor Alenia Spazio had reviewed mechanical and thermal constraints.

Wroclaw University proceeded to qualifications tests (cost 3.000 Euro) and the antennas failed.

In 2007 an additional contract was signed with the Wroclaw University for the development of modified antennas. This amounted to 36.000 Euro. These antennas were accepted and installed on Columbus, October 2007.

The cost of the antennas finally amounted to 86.000 Euro and was covered by a worldwide funding campaign.

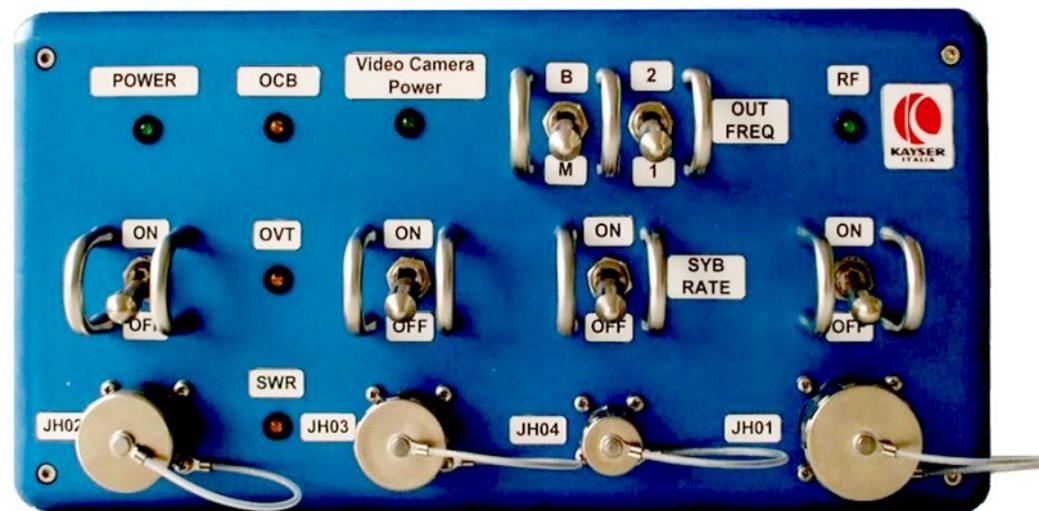
ESA supported the total installation cost of the antennas, including feed throughs and coaxial cables.

After the successful launch of Columbus and its integration into the International Space Station complex, an ARISS-Europe working group started a study for the development of an amateur television transmitter on Columbus, using one of the the S-band antennas.

A debate started between the supporters of analog television (ATV) and the proponents of digital television (DATV). The working group, which met monthly per teleconference, made progress, but was stuck by the lack of funding.

As time went by, the debate on ATV versus DATV evolved as to the advantage of the latter, but no funding was in sight...

Then, suddenly, supported by the enthusiasm of Italian astronaut Paolo Nespoli IZ0JPA, who had performed many ARISS school contacts during his 2010-2011 expedition aboard the Space Station, at the initiative of AMSAT Italia, an Italian manufacturer, Kayser Italia, presented a project for an amateur radio DATV transmitter to ESA's educational services.



In 2012, this proposal was accepted and ESA signed a contract with Kayser Italia for the development and the manufacturing of a DATV transmitter on S-band.

This transmitter, dubbed 'Ham Video', was installed on Columbus and ESA transferred the custodianship of this equipment to ARISS.

It was a long way, spanning sixteen years, from the initial proposal to the first ever HamTV school contact.

A new era opens for ground station operators, interested in receiving digital amateur television from the International Space Station. A technical challenge already met by a few ground stations in Europe, USA and Australia.

Long life to HamTV and success to the pioneering ground stations, world wide!

Gaston Bertels, ON4WF ARISS-Europe past chairman



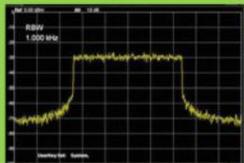
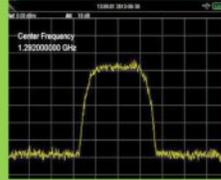
## Digital Amateur TeleVision Exciter/Transmitter

now available from

# DATV-Express



- A more affordable DATV exciter can now be ordered
- Fully-assembled and tested PCBA
- DVB-S protocol for DATV (using QPSK modulation)
- Can operate all ham bands from 70 MHz-to-2450 MHz
- RF output level up to 10 dBm (min) all bands (DVB-S)
- Software Defined Radio (SDR) architecture allows many variations of IQ modulations
- “Software-Defined” allows new features to be added over the next few years, without changing the hardware board
- As extra bonus, the team has been able to get the board to transmit DVB-T 2K mode, however we cannot guarantee the performance of that protocol. Caveat Emptor!
- Requires PC running Ubuntu linux (see User Guide)
- Price is US\$300 + shipping – order using PayPal



For more details and ordering

[www.DATV-Express.com](http://www.DATV-Express.com)

register on the web site  
to be able to see  
the PURCHASE page



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# Amateur Television Quarterly

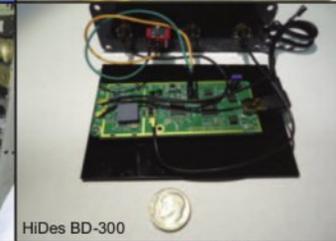
Building an ATV Controller

How To Receive Amateur Digital TV

HiDes BD-300 Product Review

MKIII Receiver Project

Early Involvement with Television



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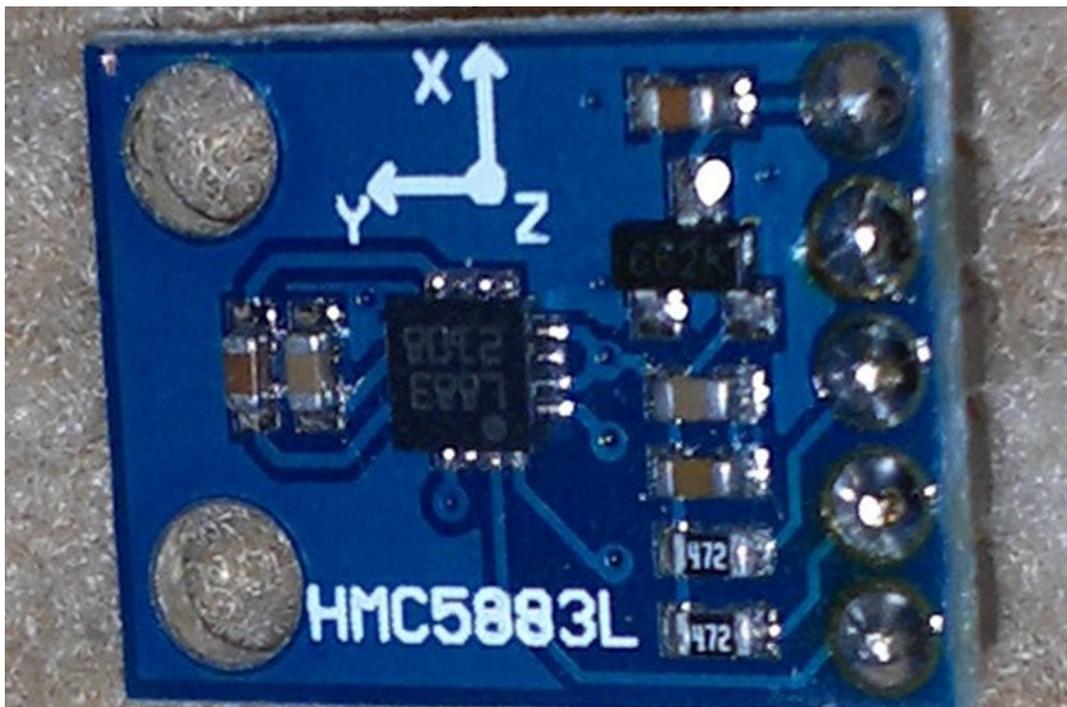
## Antenna Rotator with a TFT direction indicator

By G3RFL

In the last issue of CQ-DATV, I introduced a TFT screen that I purchased on eBay. And interfaced via a PIC to display some rather attractive colour bars.

In this issue I want to show you how I have interfaced it to an antenna rotator.

A three axis magnetic sensor indicates the direction of the antenna, attached above rotator, which supplies I2C data to indicate three-axis positional information. The sensor is the Honeywell HMC5883L, I bought 10 for £6 on eBay, and it pays to shop around.



I2C sensor

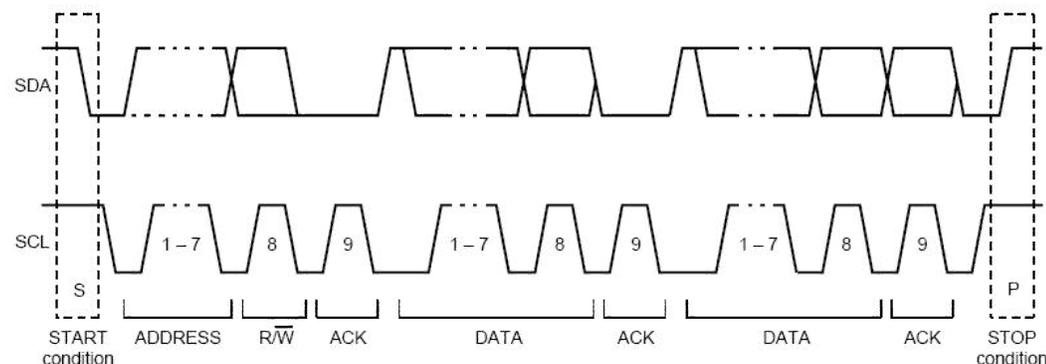
I just use the "X" & "Y" values which are 16 bit as I merely rotate my aerials, but for someone wanting to track the International space station and needs to add tilt "Z" to the aerial system, this magnetic sensor is ideal, but for this article lets remain in 2D and restrict ourselves to terrestrial contacts and kick E.T. into the long grass for the time being.

I2C data is a two wire interface plus 0V, data SDA and clock SCL. I hard drive these direct from the PIC ports because we have a long lead and need to reduce the impedance to stop RF and cable capacitance problems also we are only driving one device.

The PIC communicates to the TFT LCD RGB 320 X 480 pixels using the SPI format...in my case the speed of the I2C is around 1MHz. The I2C Comms first asserts a START logic then the SENSOR checks is it me and is it read or write then does its stuff.

The Sensor is set in INIT to point to six BYTES in its registers starting with "X" MSB "X" LSB "Z" MSB "Z" LSB "Y" MSB "Y" LSB. Each read the master (PIC) returns an ACK but on the last byte in sends a NACK to return the pointer back to the beginning register. Then a STOP command finishes that stage.

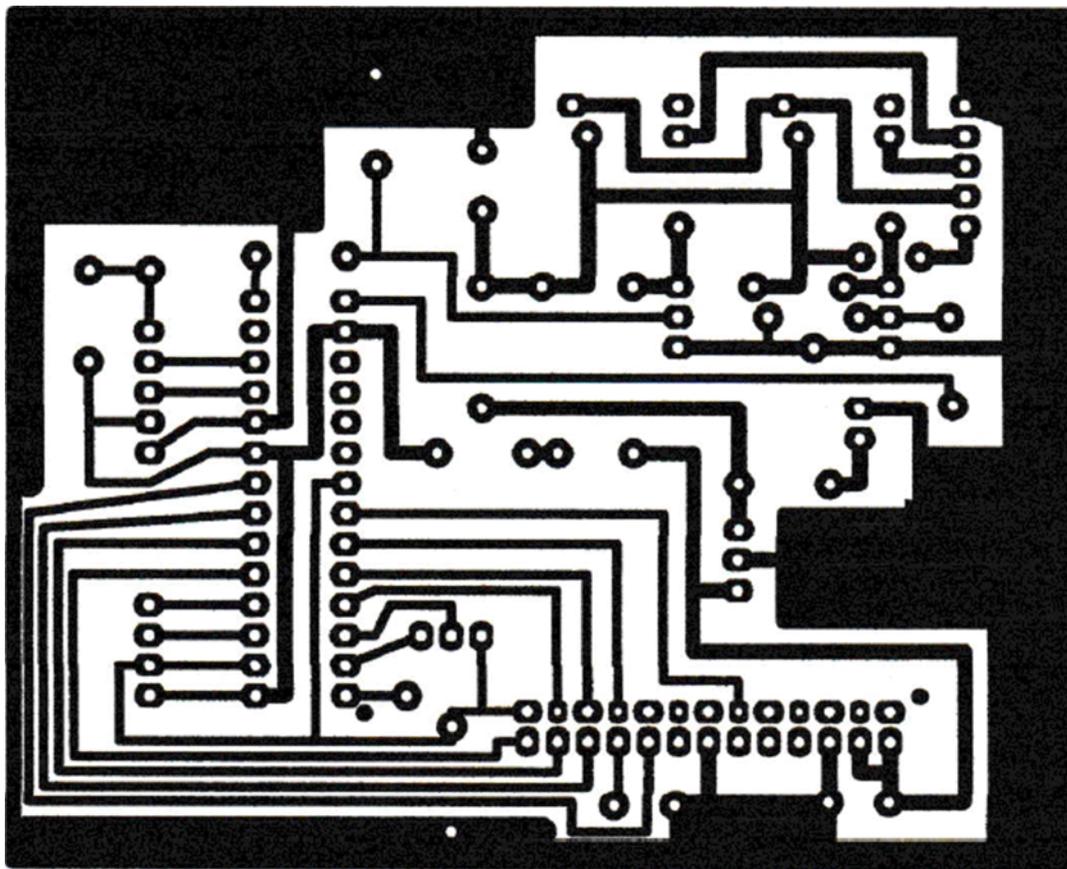
My software takes these values and compacts them into 3 x 16bit WORDS that are Signed Integers.





So it is a simple matter to finger with a plastic pen the screen to indicate the desired direction of the antenna. The screen will then illuminate the difference between the two headings and this coloured section will then decrease as the beam heading moves round to meet the selected direction.

The construction was on a single sided home etched PCB.

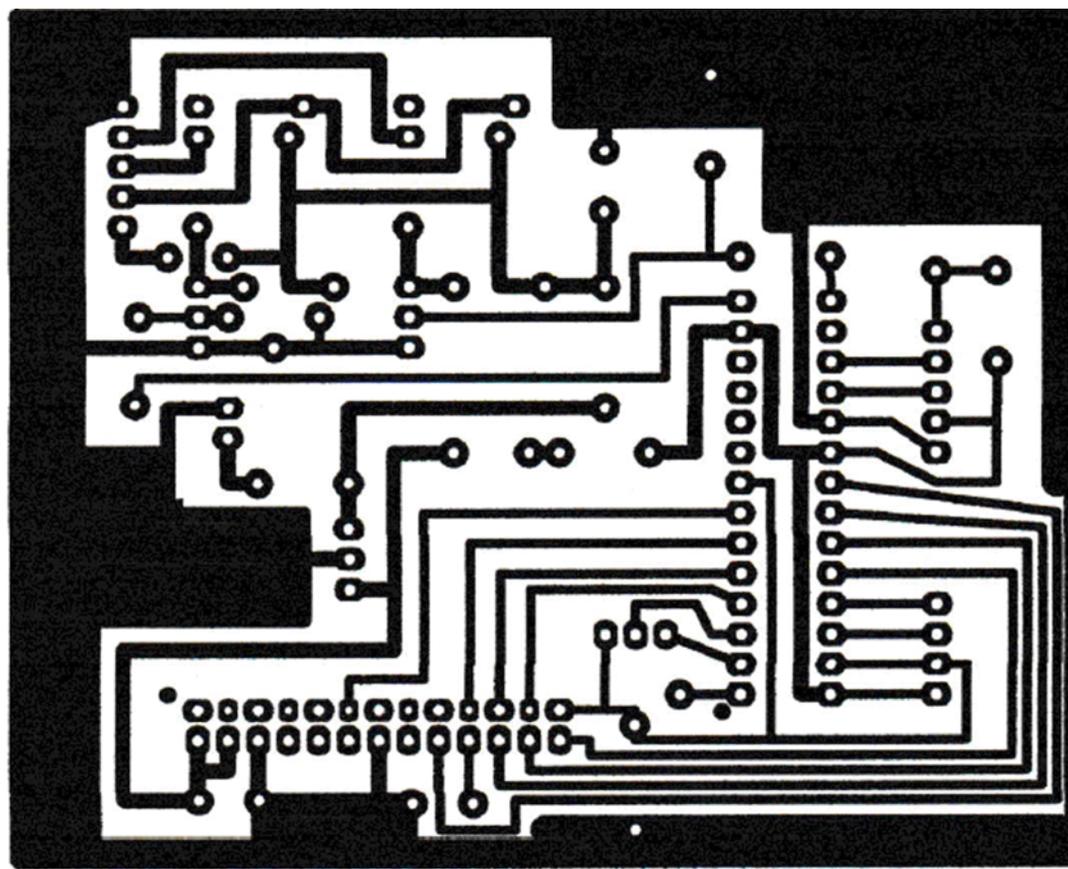


PCB from the component side (NOT TO SCALE)

My antenna rotator also requires 24v DC so I generated this with a 12 to 24v invertors, it will supply 3amps and was on eBay for £8. I have not added it to the PCB as not everyone's rotator will have a 24v requirement and in my case is a linear actuator so a bit of relay output track cutting will be required to reverse the volts and use both the NO and NC contacts.

This is the first real application of this TFT screen; it has a refresh screen of about 4 times per second.

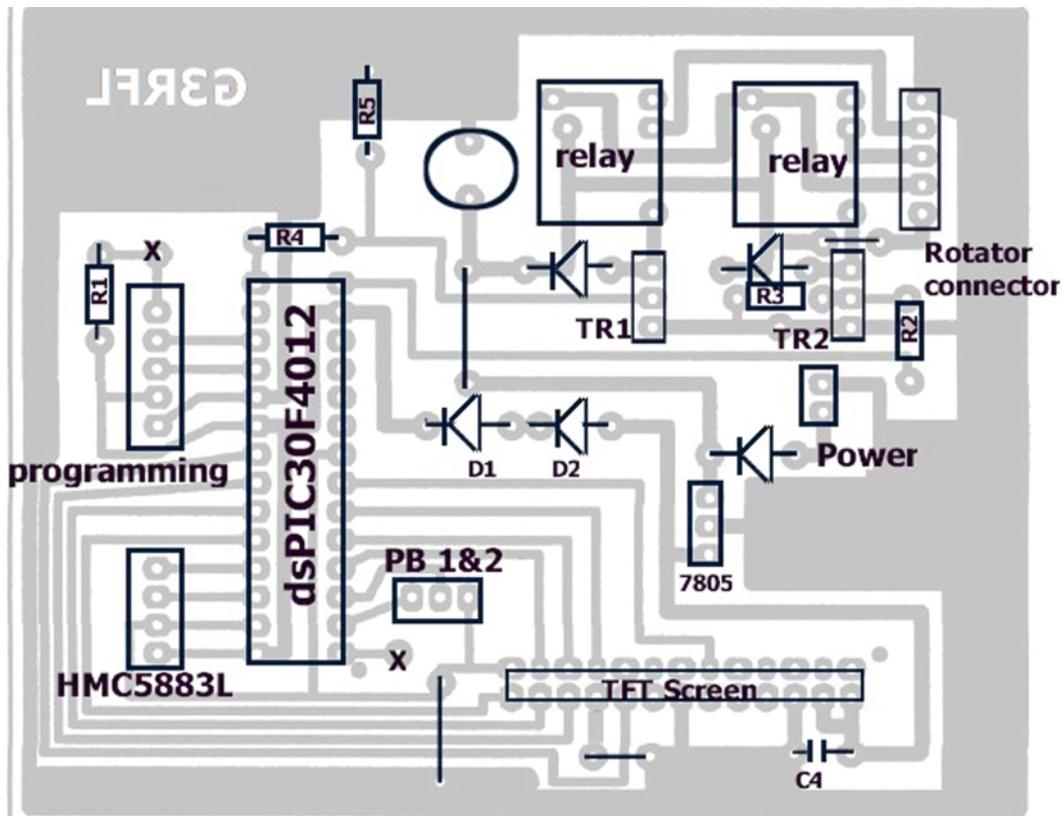
The screens are plentiful on eBay typically £11 at the time of publication and I am sure they are suitable for lots more ATV projects.



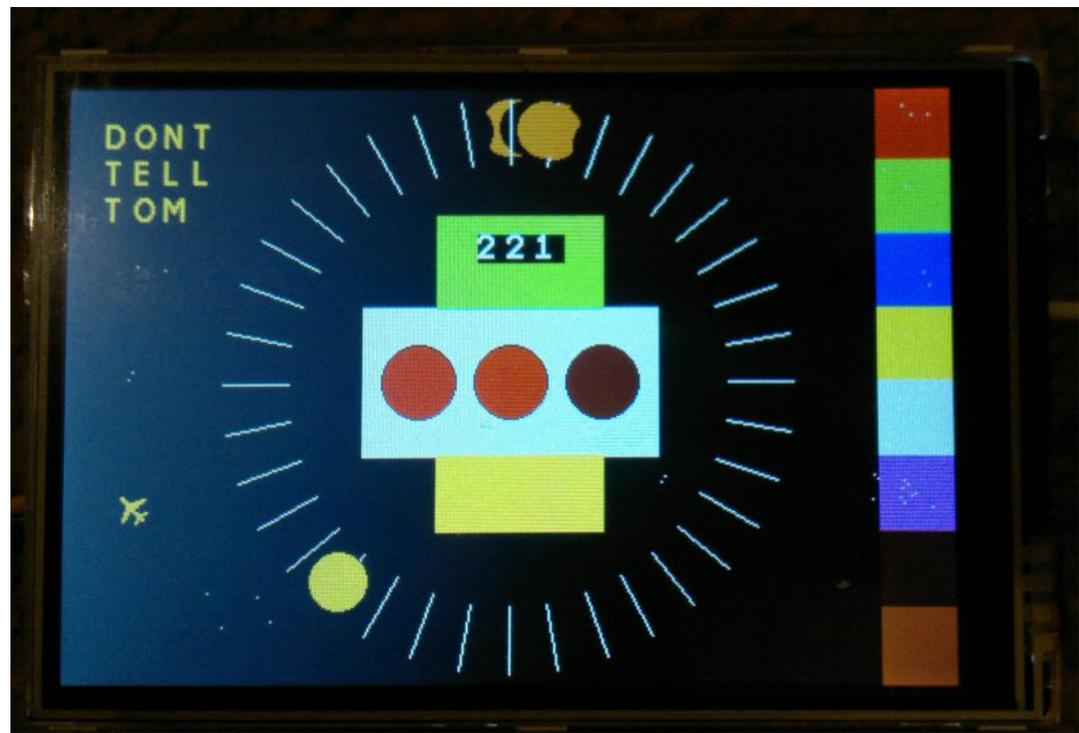
PCB from the copper side (NOT TO SCALE)

I now have added a full ASCII font thanks to Lee my son M0LMH, he's been a real help with the maths.

More pictures next page.



Component layout



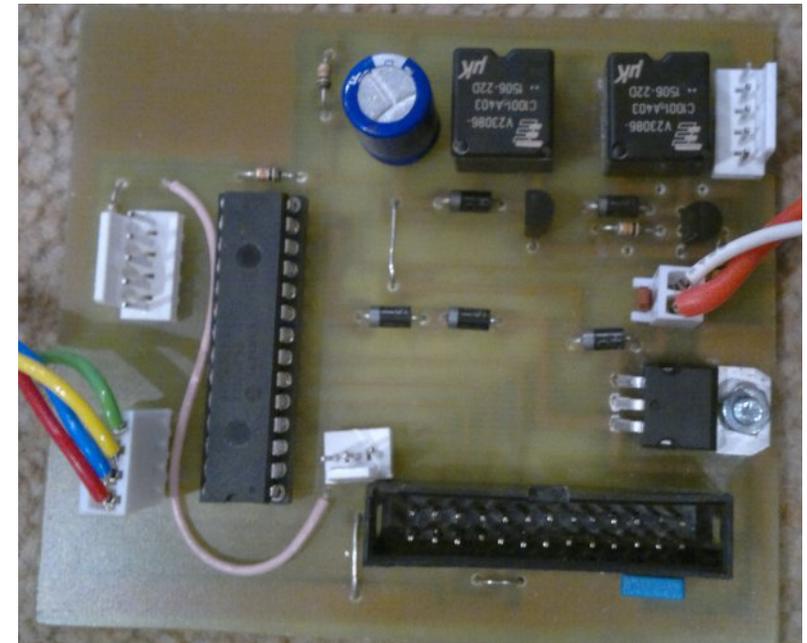
TFT Display - The red dot shows where the aerial is parked.

**British Amateur Television Club**

The club provides the following for its members:

- A colour magazine, CQ-TV, produced for members in paper or .pdf (cyber membership) formats.
- Web site – where you can find our online shop stocking hard to get components, software downloads for published projects and much more.
- A members forum at [www.batc.org.uk/forum/](http://www.batc.org.uk/forum/) for help, information and the interchange of ideas.
- A video streaming facility at [www.batc.tv](http://www.batc.tv) which enables repeaters and individual members to be seen worldwide.
- An annual Convention held in the UK where you can meet other members, visit demonstrations and listen to lectures.
- Meet other club members at the BATC stand at local rallies across the country.

[www.batc.org.uk](http://www.batc.org.uk)



Populated PCB

## *DATV-Express Project - January update report*

By Ken W6HHC

Art WA8RMC was very busy in January manufacturing a new production batch of DATV-Express boards. Twenty-four assembled PCBA's were picked up from the nearby assembly vendor on 2016-01-26. The first 4 boards that Art tested all came up OK on that day...and so Art tested the rest of the boards. USA inventory of DATV-Express boards are now full.

The EU distribution center for DATV-Express shipped five boards....all to a new group of hams working on a new DATV repeater in The Netherlands. Art immediately sent another batch of completed boards to the EU distribution center to replenish that inventory location and relieve a back-order from Belgium.

Charles G4GUO has been doing some testing of H.262 and H.265 compression CODECs for video/audio. (BTW – H.262 is just the formal name for MPEG2 CODECs.) H.265 supports HD video very efficiently...essentially twice the compression (averaging one-half the bits per frame) oh H.264. BUT...the H.265 latency is much longer than H.264. Part of the latency problem is (a) the H.265 algorithm looks forward at more video frames before it begins to create a "short hand" compression of each frame and (b) the H.265 compression algorithm is very processing intensive (Charles reported that his four-core 64-bit computer had each core running at nearly 100% of capacity). The new Windows-based programming effort by Charles can capture video/audio from a source, compress it using the FFMPEG codec libraries, turn it into a valid MPEG2 Transport Stream and then send it to the DATV-Express board where it is turned into DVB-S by the FPGA and then transmitted.

This new software is all still being worked on, but does currently supports H.262 (MPEG 2), H.264 (MPEG4-AVC / MPEG4 part 10 ) and H.265 HEVC. At the moment it only supports MPEG1 Layer II sound although Charles will be adding AAC audio.

The capturing is done using Windows DirectShow so in theory just about any device that has DirectShow support will work with it. In practice there is bound to be some device format project team does not have support for. G4GUO has tested it with 2 different Webcams, an Ezcap capture-dongle and of course vMix. It supports the usual range of symbol rates 200K to 8M and the usual frequency range 65 MHz to 2.48 GHz.

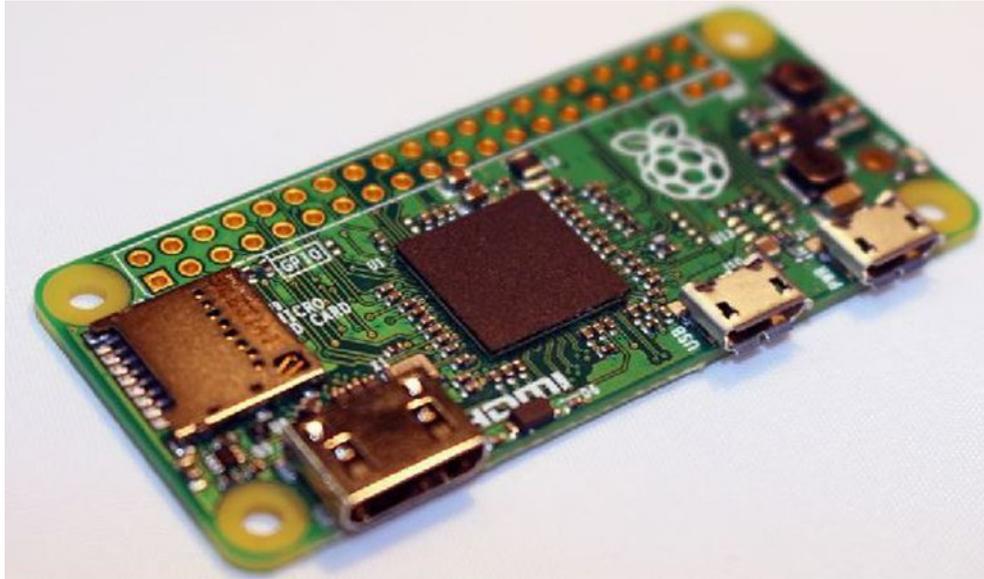
On the Yahoo DigitalATV forum, there is a lot of discussion that Hauppauge has now released the drivers for the HD PVR2 model 157210 capture unit for ubuntu. Grant ZL1WTT/VE3 reported that the ubuntu drivers can be obtained at the Hauppauge support download area. But no one has yet said that they have actually used these new linux drivers with DATV-Express and HD PVR 2 unit?? G4GUO suspects that the PVR 2 drivers are source code and may have to be compiled by the installer to be compatible by DATV-Express?? But, perhaps a new distribution by Ubuntu now contains the drivers? (Is there any feedback from readers on this topic?)

Art WA8RMC is off in Florida escaping the snow storms of Ohio and Ken W6HHC is now happily-married and getting ready for ski vacation in the Sierra-Nevada mountains of California at Mammoth.

"project is set to slow speed" ....de Ken W6HHC

## Raspberry Pi Zero development system within a strict budget

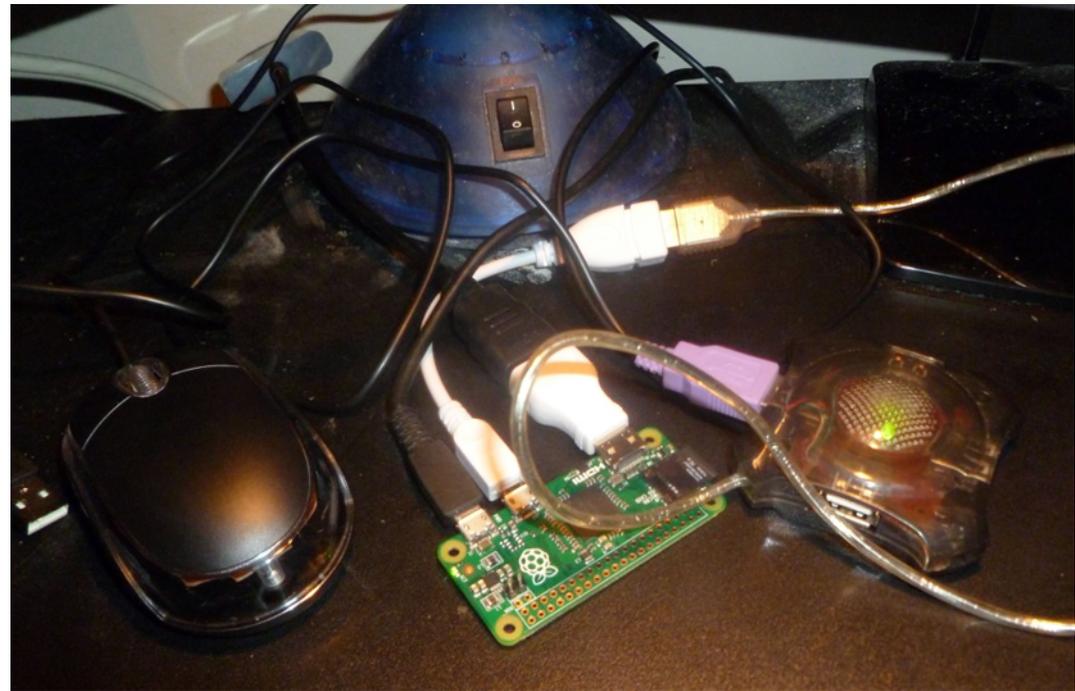
Mike - G7GTN



The Pi zero

### Introduction

Unless you have been hiding under a stone for the last 9 or so weeks then you have probably already heard about the latest Raspberry Pi called the Zero. This is a very diminutive module and at just (68X35MM) in size packs enough processing power (1GHz & 512MB memory) to make it very useful in your stand-alone home electronic or television projects. Whilst developing projects on the more mature versions probably makes more sense I decided to set up a little development system using this module and a few other required accessories. I wanted to be as frugal as possible on this project (some things never really change that much) If you read through to the end will provide all the eye watering financial details.



The first thing that you will notice is the use of a single small female USB connector which requires an adaptor to convert to USB OTG [https://en.wikipedia.org/wiki/USB\\_On-The-Go](https://en.wikipedia.org/wiki/USB_On-The-Go) you can obtain one of these small stub adaptor cables for as low as £1.00 shipped from the UK even.

Next we have to deal with some form of video output; this can be either composite video if you populate the small two pin header position or more likely for development purposes the HDMI output. But note that the HDMI connection is again of the miniature type and some form of adaptor will be required.

Since I never had the desk space or the permission to liberate the old LCD Television from the bedroom wall sought another solution. I had a good selection of recent VGA flat panel monitors and one of these seemed like the perfect display to use. Another quick look on eBay and found a £3.58 HDMI to VGA adaptor box Figure 2 which I duly purchased.



Figure 2 – HDMI to VGA adaptor box

## USB Hub

The next requirement was for a USB Hub to allow the connection of a keyboard and mouse as well as a Wi-Fi dongle to allow Internet access. For this you will need a mains powered HUB as the Zero cannot supply enough current to power all these devices together. Since I was planning to do some project development the next thing was a GPIO break-out to bread-board adaptor kit which I found on eBay complete for a very modest £2.81 which even included the cable and bread-board.

## Software download & installing

You need to download and install an operating system on to a MicroSD card to be able to do any development of projects. This alongside with very comprehensive instructions can be found using this web link: -  
<https://www.raspberrypi.org/downloads/>

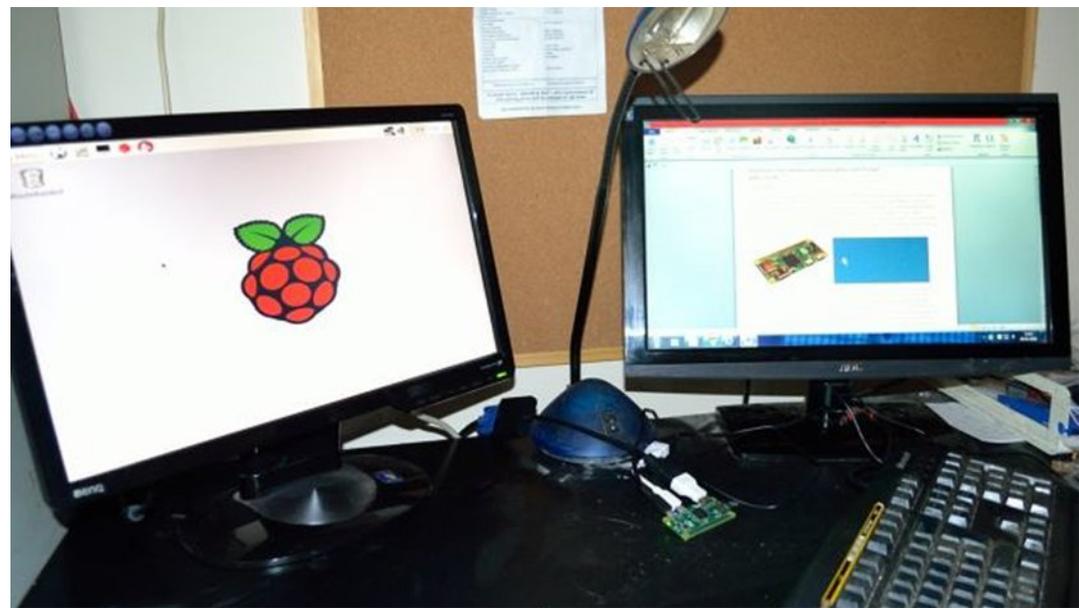


Figure 3 – SVGA screen running the Raspian OS

With no detectable operating system on the MicroSD card the Zero will just appear to be totally dead and even the power led will not show any signs of life. You need to have a good quality 2AMP + 5V power supply mine coming from a redundant Android HP tablet.

## Conclusion & that dreaded price breakdown

- Raspberry Pi Zero £4.00
- Adaptor Cables £2.00
- HDMI to VGA Adaptor box £3.58
- GPIO Break-out Kit £2.81

My total came to £12.39 since I already had a HUB and all required USB peripherals in stock. The Pi Zero can be purchased for £4.00 (\$5.00) and these parts will be reused to just develop whatever the next project is and then the module just removed and finally embedded in to this.

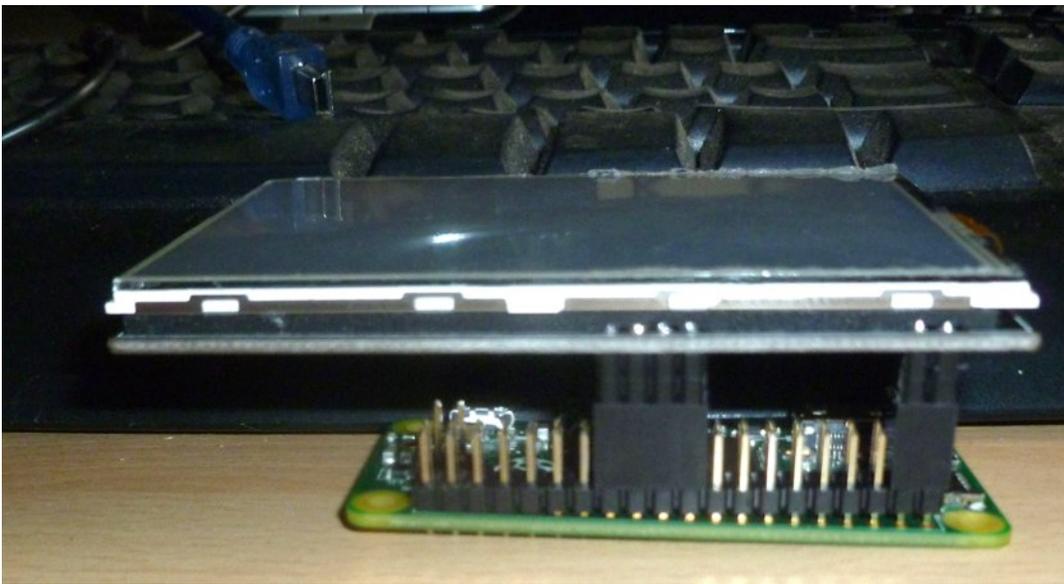


Figure 4 – Zero and Touch-screen mounted on top - but we have an issue here!

Thanks to John G3RFL and his recent experiments for pointing out the now reasonably priced eBay TFT touch-screen panels some interesting possibilities exist for your pi Zero projects as these will sit directly on the GPIO pins.

But, we lose the ability to make use of all the other IO pins, physically even small female cabled headers are too tight of a fit and hence stop the TFT panel female headers from making a good reliable connection.

I do see some options to create a break-out type board to allow options. Mechanically and creating a very generic multi-use project solution could be the engineering challenge involved.



# DKARS MAGAZINE

In deze uitgave ondermeer:  
 Er is veel nieuws van het Scoop Hobbyfonds! (P39)  
 A quick look at Peppermint Six: Linux with a small footprint(P15)  
 DX-News  
 Contest News  
 AM Nieuws  
 VHF/UHF/SHF nieuws  
 EME nieuws  
 En nog heel veel meer!

ISSN: 2452-1889

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Dutch Kingdom Amateur Radio Society

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Februari 2016 editie 20

## Situation Vacant: BATC Membership

### Secretary

The BATC is a club, your club, our club, and it's ethos is the advancement of amateur television.

It is run by a volunteers drawn from the membership. Your committee needs your HELP.

Can you help the BATC fulfil its role by taking on a task: -

### Membership Secretary.

Duties:-

- To oversee the recruitment and enrolment of new members.
- Sending out renewal reminders (postal and email) and dealing with the returns.
- Posting out first magazine for new paper members.
- Logging subscriptions received and paying the cheques into the HSBC.
- Dealing with members enquiries relating to membership.

Skills:-

- Modest use of own computer, logging on and entering and amending data into club records. (all is menu driven)
- Tactful resolution of members queries and correcting errors in database and deleting old records.

Notes:-

A large proportion of the membership deal with their own renewals via the clubs website and no action is normally needed from the membership secretary.

Ideally the new membership secretary is a member of some years standing and would agree to be co-opted to committee to have the additional permissions needed to access the database, but if any member wanted to do the job but not join the committee this would be considered.

The New membership secretary needs to be UK based because of the postal requirements.

Expenses, postage, stationary, etc. refunded.

Help and advice will be given from the other committee members.

Time commitment:-

Possibly 1 to 3 hours a week, with more at times of peak renewals. Plus joining in with committee email discussions.

Formal committee meetings are conducted by Skype and last about 1-2 hours several times a year. Ideally attendance at the club General Meeting, every other year.

If you would like to help in running the BATC, or for further information, please contact our chairman Noel Matthews [chairperson@batc.org.uk](mailto:chairperson@batc.org.uk) or the Treasurer, Brian Summers [treasurer@batc.org.uk](mailto:treasurer@batc.org.uk)

Posted by Brian G8GQS on behalf of the BATC Committee

## *The problems of still pictures and flash guns - part 2*

By Trevor Brown

In part 1 we talked about using a flash gun and explained about the relationship between the short duration electronic flash and the synchronisation of the electronic shutter, which must be kept slow enough to expose the whole frame at the same time. In this issue I would like to point out the disadvantages of flash lighting and come up with some useful work arounds.

Direct flash on camera never looks good for a number of reasons, first is the ugly shadows it produces, because it is a hard light. We define lights as hard and soft by the size of the light source, very small light sources produce hard light which in turn produces ugly shadows. It does have some advantages in that it is useful in portraits for producing sparkling eyes. so there is clearly an advantage in portrait photography for a mix of both, more later.

Hard light can be changed into soft light by lighting the subject indirectly ie. bouncing the light off the ceiling is perhaps the easiest way to achieve this and it works, providing the ceiling is a good white reflector (not always the case), and you have a flash gun which will tilt or in the case of a portrait orientation of the camera pan, but there are other solutions such as small diffusers which can be attached to the flash gun and will increase the size of the of the light source and convert the hard light to a soft light. They usually only cost a few pounds, they are often collapsible, so as to take up very little room in your camera bag.

The other flash on camera problem is the depth of lighting, the light has not travelled very far from the camera to the subject and so will reduce in brightness, as it travels beyond



the subject, the only fix for this is to remove the flash from the camera and pull it back, behind the camera to increase the distance to the subject and suddenly your lighting starts to complicate into a full lighting rig.

Before you make that jump there are one or two tricks that work for odd locations. The first is multi flash and works well for dark and gloomy static shots like a church interior. You need the camera on a tripod and set to a long time exposure. You are then free to roam around the church with a hand-held flash gun and a camera with the shutter open, hand firing the flash gun to illuminate various features, You and the flash gun need to be out of shot, when you fire the gun, I always find pillars helpful. In this way you have added multi illumination to all the various features. Admittedly not all at the same time, but on a still who is to know.

Flash is very useful for augmenting the Sun, instead of posing people looking into the sun, where they invariably screw their eyes up, try re-positioning your subject so the sun is behind them, particularly if it is low in the sky, you will get a very nice back or rim light. Their faces will be dark verging on a silhouette, but you can fix that with flash on camera, try not to overdo it, this is called flash fill and the emphasis is on the word fill.

One very exciting flash accessory is the Lastolite 20" min brolly and flash grip. To this end they have produced two excellent training videos, one in a gloomy church with lots of back lit windows and then out into a gloomy day and again flash via their grip and small brolly (be sure to watch both part1 & part2).

<https://youtu.be/yOzt57jKCLM>

<https://www.youtube.com/watch?v=iIVcN1iPdc8&feature=youtu.be>

I cannot close without a look at ring flash, every watcher of every TV crime series knows the CSI team could not exist without ring flash, but did you know it is also used in fashion photography.

This clever adaptation of flash is not new it was invented back in 1952. When used in macro photography it provides a very even illumination and very few visible shadows.

Why fashion photography, well its back to a hard light and the circular highlights that it creates in the models eyes. With modern digital cameras and their increased sensitivity you can extend this to a continuous light by using a ring of LEDs, something every one of us could construct in a couple of evenings. ideal for photographing your construction projects for CQ-DATV.





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**Radio, Electronics and Computing Exhibition**  
by the Northern Amateur Radio Societies Association at the

**NORBRECK CASTLE HOTEL EXHIBITION CENTRE**  
**QUEENS PROMENADE, NORTH SHORE, BLACKPOOL, FY2 9AA**  
**on Sunday, April 10<sup>th</sup>, 2016 - Doors open at 10:30 a.m.**



*Why not come to the Norbreck rally in Blackpool! This will be the 54<sup>th</sup> rally organised by NARSA, an association of over 40 clubs from the North West, and will feature:*

- ◆ Over 50 traders – radios, aerials, computers and components at bargain prices
- ◆ Over 40 club stands – come and find out about YOUR local club
- ◆ Bring and Buy stand – organised by radio amateurs for radio amateurs
- ◆ Construction Competition – run by the Warrington ARS ([www.warc.org.uk](http://www.warc.org.uk))
- ◆ The largest single day rally in the UK – run by NARSA for over 50 years
- ◆ RSGB book stand – several local and national officers usually attend the rally
- ◆ Radio talk in on S22 – listen in to make sure you get the latest travel information
- ◆ Facilities for the disabled – all the stands are on one floor with wheelchair access
- ◆ Hot and cold food and drink available in the hotel at reasonable prices
- ◆ Morse Tests – more info on the Region 3 Website – [www.rsgb-region-3.org.uk](http://www.rsgb-region-3.org.uk)
- ◆ For the latest information on the rally visit the NARSA website – [www.narsa.org.uk](http://www.narsa.org.uk)

**Admission £5 (under 14's free) by exhibition plan - Exhibition Manager: Dave Wilson, M0OBW, 01270 761608**

# HEVC- What's Next In Video Compression?

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With the continual rise in Internet video streaming and cloud-based solutions, it is obvious that there had to be a change in the way we compress and transmit video. This year, HEVC (H.265) has been the buzz as the codec of choice to ultimately replace the existing codecs including H.264 and others. Why all this talk about HEVC?

## Efficiency

H.264



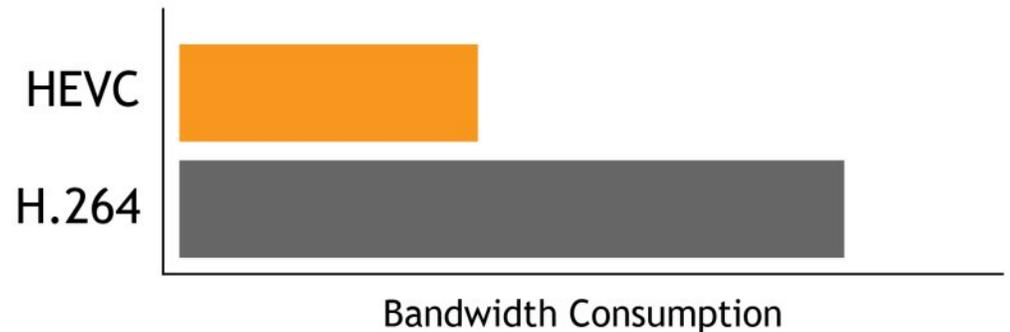
HEVC



HEVC-vs-H.264-Macroblock

HEVC is short for High Efficiency Video Coding and is an expansion of H.264. It features larger macroblocks (up to 64 x 64 pixels) which allows areas with lower complexity to be sent more effectively. The codec scans multiple frames, recognises which parts of a picture are not changing, and expands the size of the blocks for these areas. Because there is less information to be sent, it results in a more efficient encode. Typically, HEVC is able to encode video with one-half the bandwidth of H.264.

## Expansion



Same quality of video with 50% typical bandwidth savings.

HEVC-vs-H.264-bandwidth

While the upfront cost of replacing your current video system with an HEVC capable one can be substantial, there are opportunities for savings. Bandwidth of existing infrastructure limits the amount of information that you are able to send. By implementing HEVC into your video infrastructure, you would be able to send twice the amount of data over your existing network than you would with your current H.264 system.

## Upgradeability

Another trending topic amongst video professionals is 4K. Many companies have already made this transition, and there is no sign of this feature slowing down. With the upgraded resolution comes an increased amount of data required. HEVC offers a feasible solution for companies looking to implement 4K video to their video infrastructure. Companies are now able to realistically examine and evaluate the possibility of 4K video encoding.

Video professionals across the world are searching for solutions for the expanding video streaming and encoding industry.

Whether your goal is to increase efficiency by reducing bandwidth or upgrade your current system, HEVC will be the codec of choice.

Because this is such a new technology, there are currently a limited number of hardware video encoders that can handle this type of encoding. Z3 Technology is excited to offer a complete HD HEVC video encoding solution with the MVE-2000. See here to learn more about this product.

<http://z3technology.com/zeus/Product/MVE-1000-2000-2500/38.html>



Sources:

<http://www.cnet.com/news/what-is-hevc-high-efficiency-video-coding-h-265-and-4k-compression-explained/>

<http://www.digitaltrends.com/computing/h-265-hevc-encoding-explained/>

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"Three into two will go (with a bang?) - Ian

"You've nailed it" - Richard Carden

(It should go without saying - Don't try this at home)

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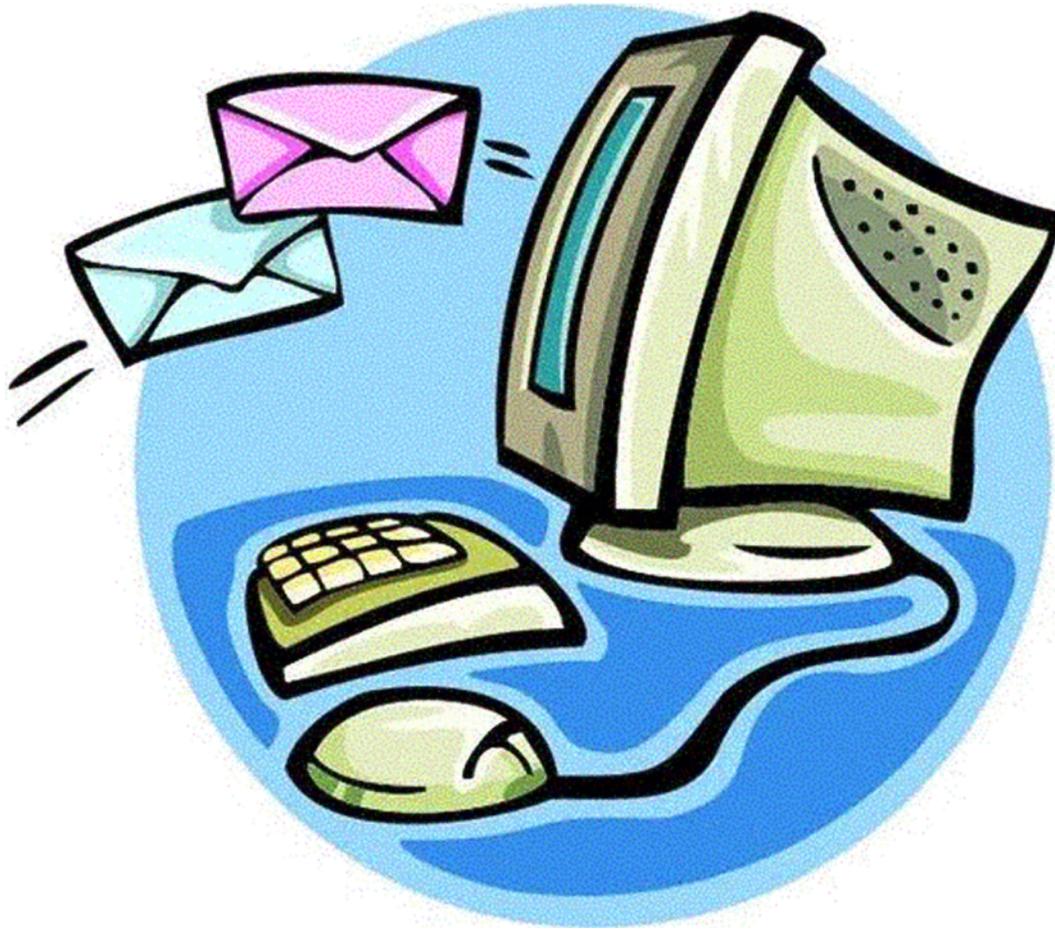
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