Caption Contest

Here are the entries for last issues picture (shown below):

"Can you please get rid of the spot lighting - I can't see a thing" Wyn MW0AQZ

"On the program today your presenter is_pause_Oh ! Pe Pe I've forgotten my name!" Peter G4LXC

"Please don't point that camera at me I'm very shy" David G8TNE

"I cannot read that without my specs" John Cronk GW3MEO

"Should have known I can't read the autocue with these glasses!" Mike G8CPF

"...and this button turns on the high power strobe light." Don Hill, KE6BXT

and the winner is... Mike (G8CPF), congratulations, a caption generator will be on its way shortly. Please send in your suggestions for the image below, by email to editor@batc.org.uk or by post (see committee contacts for address)

Contents

Committee Contacts

President: Peter Blakeborough G3PYB
E-mail: president@batc.org.uk

Chairman: Trevor Brown, G8CJS
Club affairs and Technical queries, especially relating to handbook projects. 14 Stairfoot Close, Adel, Leeds, LS16 8JR. Tel: 01132 670115
E-mail: chairperson@batc.org.uk

General Secretary: Brian Summers, G8GQS
General club correspondence and business.
Email: secretary@batc.org.uk

Hon. Treasurer: Brian Summers, G8GQS
Enquiries regarding club finances, donations and constitutional enquiries. 9 Prior Croft Close, Camberley, Surrey, GU15 1DE. Tel: 01276 677879,
Mobile 077 4029 1191
Email: treasurer@batc.org.uk

Membership: Pat Hellen
Anything to do with membership, including new applications, queries about new and existing membership, non-receipt of CQ-TV, subscriptions, membership records, etc. The Villa, Plas Panteidal, Aberdyfi, Gwynedd, LL35 0RF, UK. Tel: 01654 767702
E-mail: memsec@batc.org.uk

Club Liaison: Graham Shirville, G3VZV
Anything of a political nature, co-ordination of ATV Repeater licences. Birdwood, Heath Lane, Aspley Heath, Woburn Sands, MK17 8TN Tel: 01908 282292
E-mail: g3vzv@amsat.org

Contests: Dave Crump, G8GKQ
Wg Cdr D G Crump, Mailbox ACT, BFPO 63
Email: contests@batc.org.uk

CQ-TV: Chris Smith, G1FEF
Anything for publication in CQ-TV magazine, except advertising (see below). Email preferred, or by post to: CQ-TV, 89 Wellington Street, Thame, Oxon OX9 3BW
Tel: 01494 562355
Email: editor@batc.org.uk

Members Services: Chris Smith, G1FEF
See above for contact details

CQ-TV Advertising: Trevor Brown, G8CJS
14 Stairfoot Close, Adel, Leeds, LS16 8JR.
Tel: 01132 670115
Email: adman@batc.org.uk
Members ads for inclusion in CQ-TV should be sent directly to the editor, either by post or e-mail (see above).

BATC Webmaster:
Anything to do with the BATC web sites
E-mail: webmaster@batc.org.uk

Publications: Paul Marshall
Handbooks, back copies of CQ-TV and anything related to the supply of BATC publications; Library queries related to the borrowing or donation of written material; Audio & Video archives. Fern House, Church Road, Harby, Nottinghamshire NG23 7ED
E-mail: publications@batc.org.uk

Advertising Rates

Size	Mono	Colour
Quarter page	£45	£75
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Full page	£150	£200

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If you would like to advertise in CQ-TV, then please contact our advertising manager: Trevor Brown, 14 Stairfoot Close, Adel, Leeds, LS16 8JR, England. Telephone: +44 (0) 1132 670115.
Email: adman@batc.org.uk

Deadlines

CQ-TV is published quarterly in February, May, August and November each year. The deadlines for each issue are as follows: -

February	-	please submit by	December	31st
May	-	please submit by	March	31st
August	-	please submit by	June	30th
November	-	please submit by	September	30th

Please send your contributions in as soon as you can prior to this date. Don't wait for the deadline if you have something to publish as the longer we have your article, the easier it is for us to prepare the page layouts. If you have pictures that you want including in your article, please send them, in the highest possible quality, as separate files. Pictures already embedded in a page are difficult to extract at high quality but if you want to demonstrate your preferred layout, a sample of your finished work with pictures in place is welcomed. Please note the implications of submitting an article which are detailed on the contents page.

Editors Preamble

First of all I must apologise for the late arrival of the August edition of CQ-TV, although perhaps I shouldn't be apologising, instead I should thank those few who came up with articles for your magazine at short notice, I know I sound like a broken record, but there are so few members contributing to the magazine that it really is a struggle to fill the pages with material of interest and relevance.

So again I plead with you - if you have anything at all that might even remotely be of interest to our readers, please do send it in to me!

One subject that keeps cropping up is the subject of how to get started in ATV, there is a lot of technical information in the archives, but finding it and deciding if it is relevant to todays ATV activity is difficult. So I am asking for your help; if anyone would like to collate information from the archives, or even create new information that we can publish as a series of articles in CQ-TV to assist the newcomer and get them started in our hobby, please get in touch.

Now a couple of acknowledgements: Thanks go to Dicky Howett for the caption contest photo, in case you don't recognise me, it is a picture of your editor at the clubs 60th birthday event struggling with a none existent internet connection, so do your worst and send your captions in. Secondly, the photo on the front cover of the cake cutting is courtesy of the RSGB.

For those of you that didn't make it to our 60th birthday event at Helidon Lakes Hotel, you missed a real treat; although I personally didn't get much time to have a good look around at the TV hardware on display both outside with the O/B trucks and inside in the room next to the lectures, there was a lot to see and thanks goes to everyone who made the effort to bring along their equipment for us all to see. Thanks also to everyone who stood up and gave a talk, the lectures are on the streamer site now (thanks to Trevor for the time consuming job of editing them) and apologies for the poor sound on some of them - there really were a lot of problems we had to cope with that day,

it's amazing that we achieved what we did... it's a long story and I won't bore you with the details, but rest assured that there were people running around behind the scenes, with lots of hair pulling and gnashing of teeth, in an attempt to get it all working!

Last, but certainly not least; thanks to Jill and Paul for organising the whole event, especially to Jill for the lovely cake; organising an event like that can be a thankless task at times, but from the comments and feedback I have heard, your efforts were well received/

And so to this issue; I hope you enjoy reading it, I have attempted to include a bit from lots of different areas of interest, please keep your letters or emails coming in, remember that you can have your advert included for free if you have something to sell or are looking for something, I would particularly like to hear from anyone who has any requests for articles of a particular kind or suggestions in general.

73, Chris Smith - G1FEF

We have produced a DVD containing electronic versions of CQ-TV and the CQ-TV articles index. Also included are electronic versions of our three most recent handbooks, 'Slow Scan Television Explained', 'Amateur Television Handbook' and 'An Introduction to Amateur Television' as well as the Lighting eBook.

The archive contains all past issues of CQ-TV and is updated 4 times a year, to include the current issue of CQ-TV.

The DVD is playable in a standard (domestic) DVD player (and on a PC with a DVD player) and the data files will 'auto-run' when the DVD is put into a PC.

The video section was prepared by Brian Kelly and contains videos from Bletchley Park 1999, one from Shuttleworth 2002 and one from 2004. The DVD is available to members for just £5 inc. postage to the UK and EEC.

http://www.batc.org.uk/club_stuff/pubs.html

Note: This DVD is supplied on +R media only.

Chairman's Column

I hope by now everyone has recovered from the BATC 60th party my personal thoughts are what a stunning venue and how good it was to see lots of faces from the past. My congratulations to the organising team of Jill and Paul, I know we had problems but apart from the internet connection, they really did not impact on the event or anyone's enjoyment.

I was looking back through the CQ-TV archive only the other day when I came to the 50 years centenary issue of CQ-TV, it makes you think how far the club has come in the last 10 years, but now with the 60th behind us it's time to start looking ahead again and try and plan our future goals and take a pro active approach to making them happen. We need to attract more members, find more events to stream and interesting articles to swell the pages of CQ-TV.

Next year is a BGM year and we need to start planning now. We have already chosen the date which will be Sunday June 6th 2010 and we will be again using the Helidon Lakes venue. There will be the same special room rates for those that wish to stay overnight on the Saturday and we are looking at repeating the Gala dinner which went down so well at the 60th Party. Let's hope the internet connection holds up, now streaming has become such a large part of our activity. Wherever we hold the BGM we run the risks of losing the internet connection, you can check the internet for performance before the event, but on the day things can change. A 3Gs connection is the only backup plan and Helidon Lakes did seem to be in a mobile phone black spot, but perhaps with a little planning we can improve the reliability, after all we are a communications club.

Since streaming the 60th we have added another AMSAT Colloquium to our success record and although again we were plagued with internet problems, we were this time able to fall back on a 3G's connection. If you missed the event the lectures are now available on the streamer film archive. Electronics and Teddy Bears: A Near-Space Adventure was perhaps my favourite closely followed by Engineers Wanted and just for fun, the rocket competition and the Quadrocopter. I have put the quadrocopter on the streamer site 3 times at different resolutions as an engineering test, this is a short programme and shows a TV eye view from a very small electric powered model quadrocopter.

The streamer is also about to move into its second year Chris has one or two changes in mind for the software interface. The existing commercial sponsorships also expire and we have set the cost of the sponsored links at £250 for the next year, if any of you are involved in a commercial venture and would like to try one of the links for the next 12 months, then please contact me. Two of the links have already been renewed and the income will be ploughed into improving the small mobile TV studio that has been used successfully for televising the majority of the streamed events. The studio has already had an audio mixer and radio mics, added and if we are successful at raising enough sponsorship on the site we will be investing in a digital recorder, so the events can be recorded at a higher resolution and continue to be transferred to the video library. This link in the system and has so far been filled with loaned equipment from Peter Blakeborough. Mike Cox or myself. It is important that the small mobile studio should be self sufficient in kit, hopefully we can jump to the next generation of digital recording equipment using a hard disc recorder rather than the digital tape recorders we have been borrowing. This will remove the requirement to digitise all the tapes onto a hard drive in real time prior to transferring them down the internet to the streamer. This is a time consuming process and removing one of the stages of this process will help speed up the task.

Let me leave you to enjoy this edition of CQ-TV, my thanks to all the contributors and Chris for his sterling work editing it

Trevor Brown
BATC Chairman

ATV Newsletter

The ATV Newsletter is a weekly publication covering World ATV News that I find interesting as well as events, projects and activities sent to me by my readers. You also get the latest Local ATV News from the repeater networks here in Southern California. And it's free. Plus information on Digital-ATV/ATV GUIDE, for weekly scheduled ATV events via Streaming Video/ATV Website Links/and more. To subscribe send me an email with your first name and call to *atv-newsletter@hotmail.com* and I will add you to the mailing list. You can also include any info about your ATV activities in your email, if you wish. I just might put it in the newsletter!

Bryon Foster - N6IFU (Editor & Publisher of the ATV Newsletter)

Do your own Thang

By Trevor Brown G8CJS

Digital TV Production is growing and for somebody brought up on traditional video, with all its associated problems usually revolving around hardware issues, it was quite a jump to make, using computer software to manipulate video into some form of end product, without multiple video recorders, Edit Controllers, Vision Mixers, DVE picture manipulators, and Character Generators

In this brave new world the camera still remains but the video is imported into computer either direct from the camera or from a 1st generation recording preferably as a digital format. All the traditional production hardware is replaced with software. This was a necessary jump when I made it some years back for a commercial venture, the end product then was a DVD. The only alternative was to create something via traditional means and then to record it onto DVD via a standalone DVD recorder. I did consider this and well I thought it was an approach to avoid

for two reasons, first the DVD's don't look very attractive with little or no start menu's, adding chapters and other DVD options is almost impossible and because it does not help as a stepping stone to full digital TV production.

Having spent quite a lot of my children's inheritance (to quote Duncan Ballantyne) on video software to create something that could be used in a commercial world I thought I would go back to basics and see if I could originate something for the streamer using only free software.

Several attempts with free downloads soon showed why they were free they all had functions missing and were often slow and difficult to use, but in the end I settled on Thang. It's a free download and can generate a file that can be directly uploaded to the streamer as an *.flv file. The end result is not what you would describe as high end picture quality, but remember it's free software

The challenge I set myself was to mix

several slides together and add a sound track, the end product I wanted to upload to the streamer having already done this for Monoclus the OB truck belonging to the late Joe Rose. I thought I would try and emulate the programme format but this time using free software.

Thang will not capture video it relies on the clips being already on your computer having found their way there by some other method, but for stills downloaded from a memory card this is not an unrealistic situation.

Getting started was simple. The Thang site asked for an email address and then allowed me to download the 16.7MB file. The program runs on Windows 2000 XP, and Vista, and installed normally on my dual core PC, but it would run on a more humble hardware. It requires 512MB or more Ram, 30MB of hard disc space for the download, and some 300MB to 600MB work space, a Intel Pentium 4 or equivalent, 1GHz Processor or faster, and a screen resolution of at least 1024x768-16bit
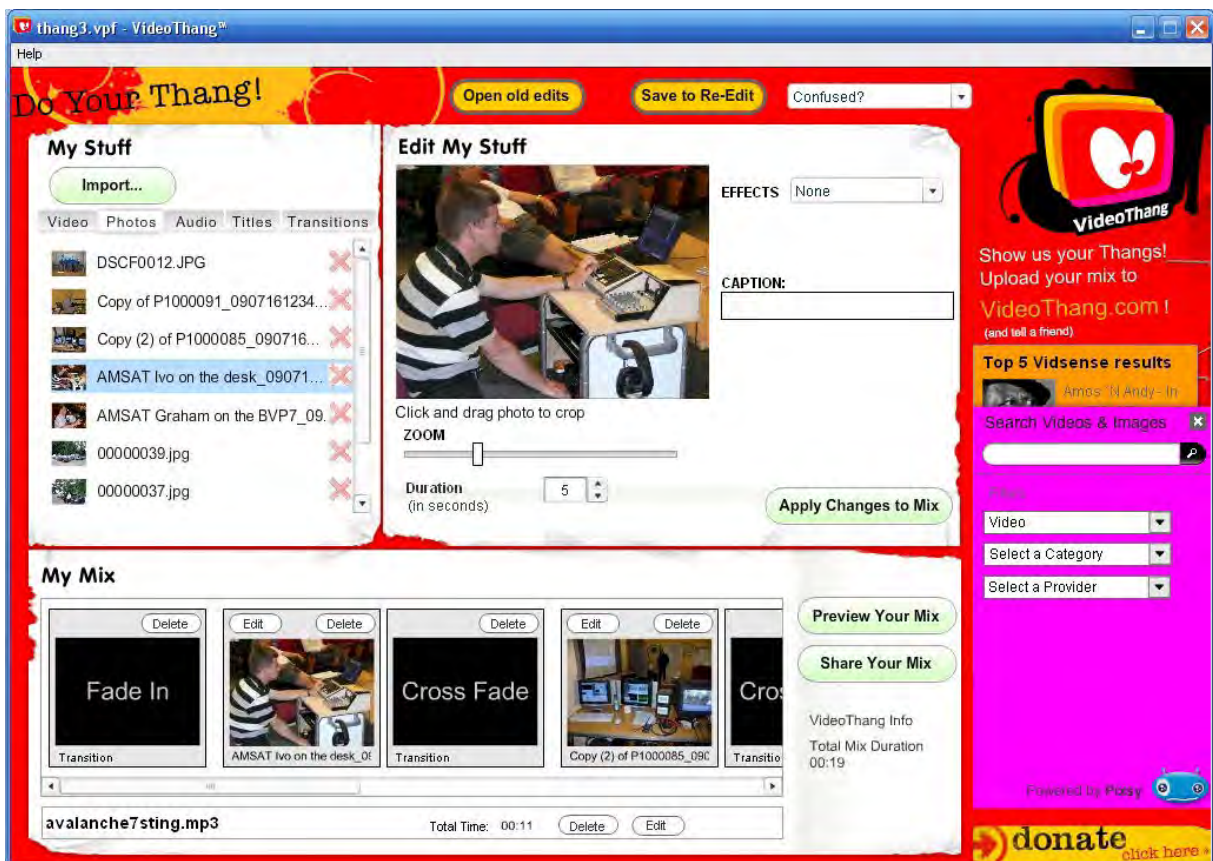
The interface has three windows: My Stuff, a library for content and effects; Edit My Stuff, a preview and editing window; and My Mix, a storyboard for arranging your content and building your "mixes." Buttons across the top enable work to be saved and retrieved. A drop-down list on the upper right provides access to the useful Help File. The whole language of this software has been aimed at what nowadays is referred to as the Nokia generation

It will import still images and MOV, AVI, MPG, MP4, PNG, WMV, and FLV video files. I tried Jpegs and an FLV file only. Editors for *.flv (streamer format) are a little hard to come by and I suspect this maybe the only free software offering this option. The front panel was a pleasure to use. The My Stuff panel has an import button and tabs to select Videos, Photos, Audio and two other tabs Titles and Transitions. The windows file structure soon enabled me to import a selection of slides in *.JPG format. Selecting a slide brings it up in the Edit my Stuff window, where the slide can be zoomed panned and cropped to get the best part of the picture. The slides can also be captioned in Edit my stuff, with a style selected by the Titles tab. When you are happy click the Apply changes to mix and the slide is transferred to My Mix.

If you import a video clip and select it so it appears in Edit my stuff Thang knows it's a video clip and the zoom control for slides is replaced by as slider that allows you to trim the in and out points

The remaining tab, transitions opens up three options, fade in, fade out, and cross fade. This brings up a demonstration in Edit my stuff and when you then click the Apply Changes to Mix a black screen with the appropriate legend appears in My mix at the far right, this can then be dragged and dropped into the correct position in My Mix.

The transition Choices are a little limited:

The audio tab and import will again allow you to browse your hard disc for suitable audio, and a selection can be imported into My Stuff only one file can be loaded into My Mix if you try for two it will offer a replace or cancel dialogue. You will be prompted from time to time to save your project in *.VPF format, this is a small file which keeps a track of where everything is on your hard disc and can be used to recreate any project providing you have not deleted or moved one of the files.

Preview Your Mix will run the selection in My Mix, and Share Your File will render the contents of My Mix into a completely self contained file.

You must add the extension of your choice which in my case was *.FLV. The file could then be uploaded to the streamer film archive via the upload content option. This is not normally visible on the streamer but appears when you log in, and will enable you to upload it to the streamer film archive. Remember there is a file size limit and don't be taken in by the bar graph at the bottom of the screen the uploading continues long after the graph has reached full scale. Wait for the software to announce a successful upload before you close the application.

If you want to view the *.flv file before you download it, then Riva FLV player is worth having on your PC and it again is a free download.

As free software goes, it works and the file Thang test is on the streamer for you to view. There are no picture quality verses internet speed settings, all the decisions are made for you. Personally I would prefer to make an *.AVI and then convert this to *.FLV using the Riva converter where settings for resolution and bit rate are available. Thang also does a lot of rendering when you import files and you have to learn to be patient, it also locks you out while it renders. The more professional software does this in the background so that you can get on with the task of creating your programme. It also puts a short ad for itself on the end of the programme; you don't see it in preview, so without the Riva FLV player you would not be aware of this until your file was on the streamer. The bottom line, it works and enabled me to create something for the streamer using free software.

http://www.videothang.com/support/download.php

http://rivavx.com/index.php?downloads0&L=3

HD Production from a trailer

By Mark Bloor

For those of you that can remember or indeed care, about 6 years or so ago I wrote an article for CQ-TV about my thoughts for an Outside Broadcast (OB) unit for the future.

At that time I had the old TVS Sony Scanner which I had extensively refitted to include a computer based Vision Mixing and recording system along with Sony CCD cameras replacing my old Hitachi SK97-970's. The cameras were quite elderly CCD devices and reliability was a nightmare, in fact I would go as far as to suggest that they were the most unreliable cameras I had ever used, and I have used everything including the Marconi MK VII for which I still have a soft spot... its where one fell on me (Joke!), MK IX and the aforementioned Sonys and Hitachi's.

After a lot of thought I decided to sell on the Sony Unit which is now in the care of Steve Woodgate and build a new unit from scratch, initially utilising what I could from the original Sony unit but in a more compact form. I thought about a Ford Transit type solution, which Richard Harris had very successfully done over 20 years previously but as I hoped that the unit would be good for a number of years, and given that vehicles deteriorate and cost money to maintain, tax and insure I looked at the prospect of a trailer having seen a rather successful local TV group in America build one.

Having decided on this plan of attack I had to decide on size, height, weight and did I want the equipment to be fixed or removable (Fly away PPU etc). I also needed to decide on equipment. At the time I was persuaded to keep the Sony's and spend a fortune having them re-capacitored. It was a mistake and whilst it did improve matters they were still unreliable.

At that time I built the system around the NewTek VT mixer and recorder, Sony Cameras and a mixture of LCD computer screens and Vistek colour monitors, these could be switched to act as preview monitors using a quad split device or in component mode as a reference monitor. The arrangement was put in a 19" flight case about 25-30 U high Vistek at the bottom and LCD above. On the rear of the rack was the NewTek breakout box (think of it as a vision mixer). This was then duplicated so I had 2 identical racks. A third rack had the camera CCUs, Preview matrix and another Vistek colour monitor along with a couple of Behringer units that acted as a highly effective talkback unit and took up 2U of rack space. Waveform monitoring was using a Hamlet unit with the colour monitor.

Now all this had to be fitted into my trailer in a manner that allowed me to easily remove it, which is what I did, but just when I thought I was safe the Sony cameras started biting again.

About this time I had decided that 16x9 would be nice and of course there was the new HD rearing its head. Well there was no chance of getting any of this equipment out of the broadcasters and in any case I was getting fed-up with repairing equipment that was becoming ever more difficult to repair. You need hot air guns and the final death knell ..."Oh no sir that particular chip is obsolete and we don't have an equivalent".

So what I needed to create was a High Definition capable unit which automatically gave me 16x9, bypassed all the broadcasters old tat and wouldn't cost an absolute fortune.

I had also made the decision based on multiple previous recordings that modern cameras automatics are such that my services as an engineer would no longer be required and at last....."fanfare..." after a break of 30 years I might be able to go back to directing again which is what I originally started doing this for. I actually directed my first multicamera recording when I was 18..even then I had to make the leads for it. It was a 3 camera shoot of a concert in gloriously laggy vidicon black and white.. which is why I needed to get decent read Broadcast colour cameras...and that's how it all started. Thanks Brian (Summers) for my first MKVII and 390 EXH (BBC MCR 23) now owned by Paul Marshall.

Having decided to go down the route of HD I needed to make some equipment decisions, initially I was looking at the JVC GY100HD cameras with analogue YUV feeds back and possibly the Edirol component mixer. Mercifully I couldn't afford that at the time, and following a phone call from Trevor (Brown) I came across the Data Video SDI mixer.. now this looked interesting and its got realtime downconvertors to PAL

so I can carry on using my quad split display devices now all I needed was an LCD that would display PAL and UNDERSCAN...fortunately this took some time to find.(I never did find one at an affordable price).

In the intervening time Panasonic had announced their AGHPX 500 cameras.. now they weren't cheap but they did have HDSDI out.. maybe I should be considering HDSDI.

So I took the plunge and purchased 3 which was made less painful due to the fact that I could recycle my extensive B4 lens collection. Shortly after this Panasonic brought out their AVHS400 which has multiple previews (up to 8) as well as PV and TX all on one output, only trouble was it was HDSDI however an HDSDI to DVI adapter soon solved that issue. So I now had an HDSDI mixer and HD cameras and thankfully a job at Glastonbury as the client specified HD. Ah yes I hear you call but what about talkback, cues and a recording might be nice! I had decided at this time what I wanted was a quick in and out arrangement, so I elected to go for radio talkback, utilising in ear read iPod style earphones and ear defenders over. We have the best talkback I have ever had rarely are the camera operators straining to hear. So what about the recorder.. HD cam was out of the question but Black magic make a range of affordable cards that can record HDSDI straight to computer hard-drive so its edit ready. My only remaining issue is cues and that was sorted using satellite cable in fact decent quality sat cable is good for 100 metres plus of HDSDI and the insertion of reclocking amps allows me to comfortably reach 300m runs.


So what for the future, well I wanted multiple ISO records and back-ups, sounds like Patsy from Absolutely Fabulous..''I want total sensory deprivation and back-up''. Well what could I do for that? well multiple PC's and Black magic cards would work but thats a lot of PC's. I have been fortunate, being asked to beta test a solution which is now available and allows in a single PC up to 5 channels of HD to be recorded with moderate compression for subsequent editing..you can even do a virtual switch, which produces an EDL (Edit Decision List) which can be imported into a number of editors and platforms i.e PC and MAC resulting in a timeline that faithfully re-creates your cut but as all the streams are present you can trim the cut making it even tighter. What this unit has allowed me to provide, in a 14 foot x 7 foot trailer is an 8 input SD/HD mixer with upscaling

and downscaling all in real time. I can record all 8 ISO channels plus the master mix twice, additionally because I am using embedded audio I can record 20 discrete channels of audio as well, theoretically I could record many more audio channels but there just isn't the codec support.

Having decided on all my equipment I now had to decide how to install it in my blank canvas.

Initially I clad the roof of the trailer to exclude light and insulate it. At that time I also decided to use LED downlighters during production but have also put in fluorescent tubes for working and setting up. I also felt that as the mains supply can be a little "iffy" on an OB, in fact one particular council, that shall remain nameless, has unplugged me twice in the middle of a live production 2 years running!. Using file based recording sudden power loss would result in unreadable files, disastrous. What I needed was a UPS and what I managed to get were 2x 3KVA units they needed batteries replacing but that still worked out much cheaper than buying new. An additional benefit of using UPS (if they are of the right type) is automatic voltage regulation too. The UPS fitted allow me to run every piece of equipment on a "safe supply". The only exception is the Air Conditioning unit, this was strategically placed to physically balance the weight of the UPS units.

Length 14 feet x 7 feet wide
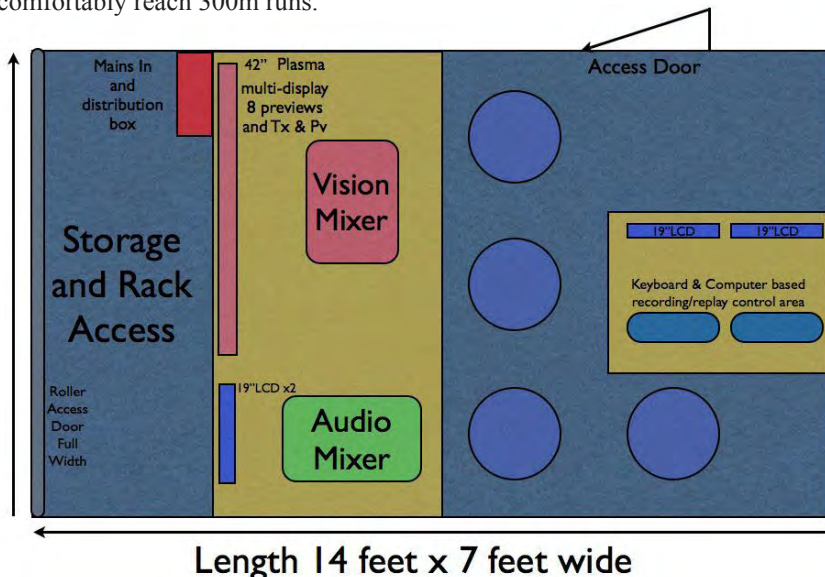
Calculations using basic Physics allowed me to roughly arrange the units so that balance was achieved fore and aft with the required 75Kg pressure on the tow bar as recommended for towing final tweaking can be the disposition of the "kit".

When it came to the design of the production area because the mixer and talkback is easily removable racking everything up in removable racks made little sense as all I really needed over and above these easily removed units was an HD monitor (for previewing) as 24 inch units are readily available I elected to buy one which I use in fly away mode and gives me a spare in the event of failure of the main production monitor.

This allowed me to go for a less utilitarian look, The production area comprises a 42" Plasma (Personal taste I don't like LCD's) for the 8 preview sources and Tx and Pv from the vision mixer.

Next to this are 2 LCD's (HD Ready) one of which is used to display a down-converted SD transmission signal with a Chromatec overlay of audio levels for the sound engineer.

The second LCD displays a computer display if required (monitoring of the multichannel video recorder for example) or a range of other inputs. Audio monitoring is arranged such that 2 channel (stereo) is above the Audio engineer, this can be switched to Surround (Dolby 5.1) centred above the plasma. This was deliberately configured this way as 5.1 mix down is likely to be a post production issue. In this case the plasma displays the full video and the speaker position is correct for that monitoring position. Under the production desk is the sub-woofer which works in either stereo or 5.1 mode.

In front of the production desk is a computer area which has the 10 channels of HD recording/replay (2 computers). These are permanently wired to a patch panel at the rear of the trailer.

Although I have plenty of musa panels I decided to go with BNC and wired U links, my reasoning for this was that BNC's are pretty much universal whereas I would always need musa to BNC adapters to over patch, more things to remember or rather to forget! The cameras just connect in via 2 BNC's HDSDI to the mixer and aux feed to the camera.

The first test of my trailer was at Glastonbury 2008. Additional cameras were patched in using analogue to SDI adapters and we ran with 6 cameras recording to a MAC and an HD-CAM deck the client hired, I didn't succumb and buy one. I am pleased to say that everything worked perfectly. This years Glastonbury (2009) arrangement was much the same except that the client didn't want to hire the HD-CAM deck and I had my multichannel recorder to test! The master mix was recorded to a MAC pro through an AJA unit. Two feeds were taken to the multi-channel recorder as master mix, the mixer out which had no audio embedded and the output from the AJA unit which did, We took an additional 3 feeds for ISO records.

What I wanted with this unit was, as I mentioned, a quick in, record, leave approach. To give some idea of the speed we can set up in we recently did a job that required 4 cameras and an audio guide track for subsequent editing. The cable runs were 50 metres. We arrived at 6.15pm and were fully rigged and ready to record by 7.00pm and there were only 3 of us.

Overall I am very pleased with the trailer, it achieves what I wanted and allows a modicum of comfort and protection from the elements. Do I miss the BBC and TVS units? yes in some ways but I certainly don't miss the maintenance tax or insurance.

Update on Line 23 Widescreen Signalling

By Mike Cox

Recently, I was offered the chance to be sent a DVD carrying about 70 looping abstract backgrounds for the price of the postage [£5 or so]. Their web site [www. footagefirm.com] let you look at a sample, and as a result, I placed the order.

The disk arrived a week or so later, and contained the 70 or so backgrounds as AVI files. However, they are 720 x 480 pixels, at 60 Hz. They can be ingested into Pinnacle edit system, but not be put on the time line with any other material as Pinnacle thinks they are NTSC.

However, I have in conjunction with my DPS Perception system [digital recorder that records on SCSI disks in Targa/Tiff format] software called

Fig. 1

Fig. 2
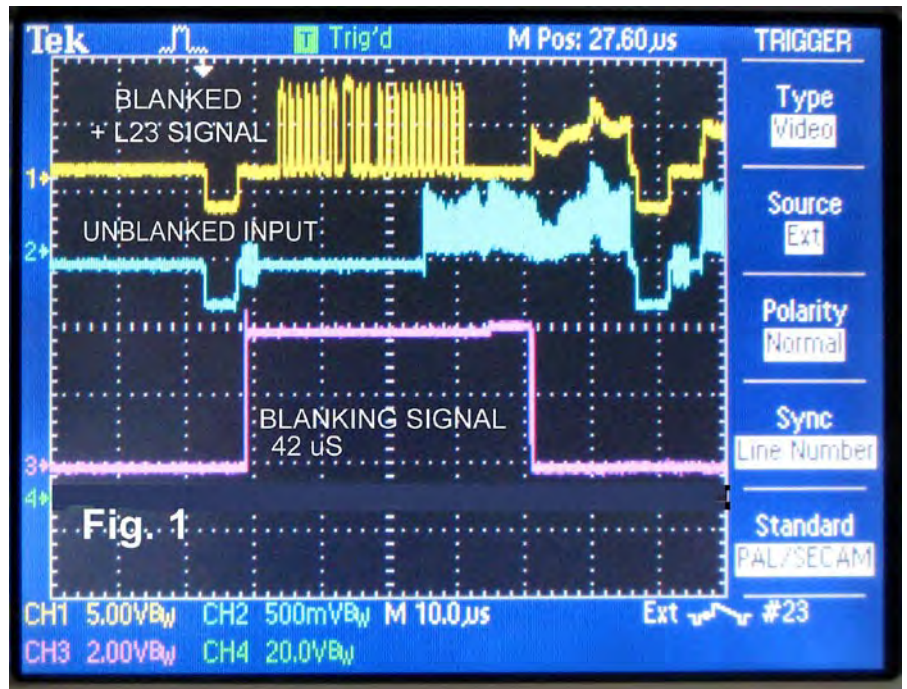
After Effects [Adobe]. This takes in .jpg still pictures or .avi video, and is essentially an animation programme. Layers can be individually scaled, rotated, positioned, faded up and down etc. It accepted the 720 x 480 background, and after a bit of re-scaling, we had a proper 16:9 version, and now a 720 x576, 25 Hz video file.

When it was all finished, the output was rendered back to the DPS SCSI disk, and appeared as a Targa file. Pinnacle however, wants AVI files, so I bought a neat little program called AVIedit that converts from Targa to AVI, which Pinnacle accepts.
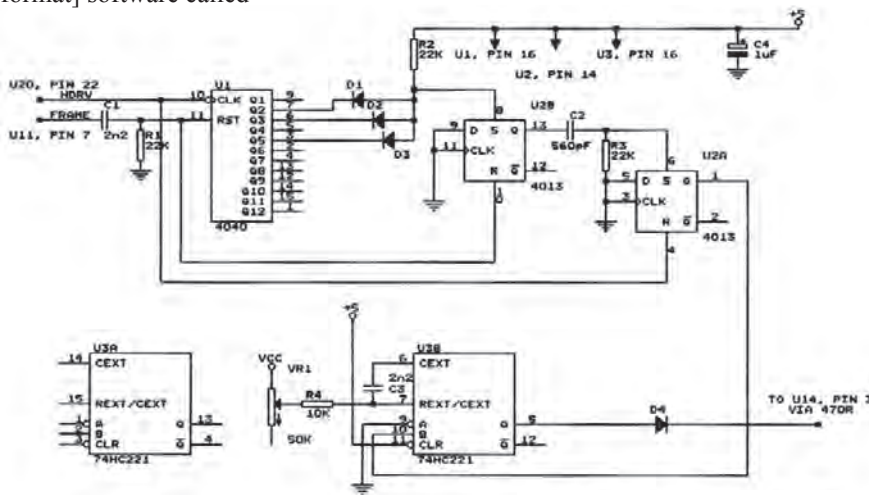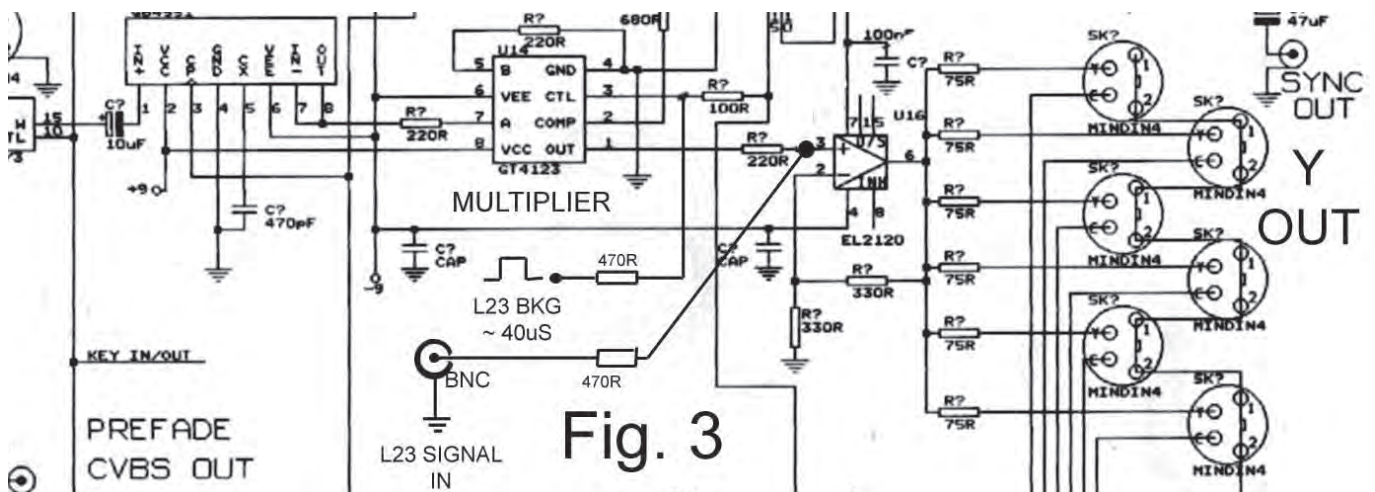

Fig. 3

Fig. 4
BACKGROUND THAT CAUSED PROBLEM

This box is in use between the DPS output and the VTR input [Y/C], but for some reason, Pinnacle was not accepting it. A close look at the waveform monitor showed that the last part of the Line 23 block was being corrupted by video, which was moving about in sympathy with the moving background. This arises because the 625-line specification says that active field starts half way along line 23, whereas the WS signalling block is somewhat longer. All the analogue signals [Y/C, mostly] come via an A/V switcher, which has a pair of GT4123B chips as a gated Fade to black facility, controlled from a simple ramp generator. Fig. 1 middle trace shows the CVBS output of the DPS engine before the fader.

Well up to a point, Lord Copper!

For a particular application, I wanted a Widescreen background, so the DPS output was recorded to DV on my Sony DHR1000 VTR, and then ingested into the Pinnacle system on playback via FireWire.

Panic! Various Pinnacle error messages appeared saying the aspect ratio has changed, and ingest shut down.

Now some of you may recall that in CQ-TV 210, I wrote a piece called "Widescreen Signalling", and went on to detail a Line 23 inserter, using current adding technique. This is a powerful technique for adding signals to video in a loop-through mode.
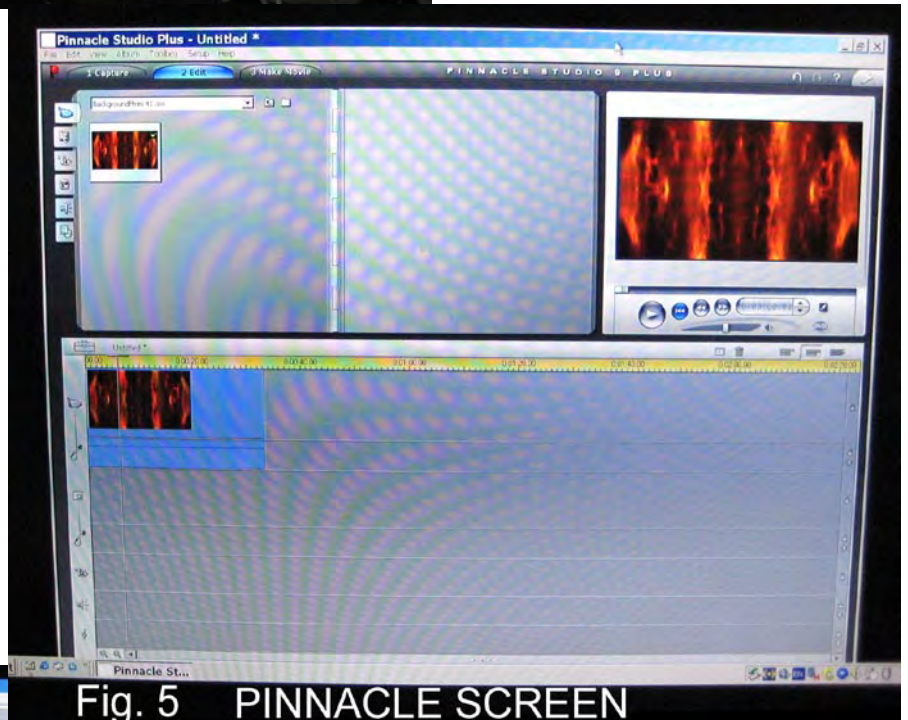
Fig. 5   PINNACLE SCREEN

Accordingly a simple counter chain has been built which provides additional blanking during Line 23 for 40 uS or so; hence providing a clean platform for the L23 signal. The A/V switcher has an SAA1101 SPG to provide blanking for the gated fade facility, and the ubiquitous LM1881 sync separator has a frame output.

The counter is an 'HC4040 12 bit counter, clocked by H drive from the SAA1101, and reset by the differentiated frame pulse from pin 7 of the LM1881. Diodes gate out Line 23, and a flip-flop gives a pulse during L23. A monostable circuit gives out a 40 uS blanking addition.

Fig. 6   AFTER EFFECTS SCREEN

Fig. 7

Fig. 8

It is noticeable that off air signals have an adequate guard band for this signal. Fig 2 shows the circuit of the blanking generator, and Fig. 3 shows part of the fade to black circuit that it is connected to. Fig. 4 shows the offending background, Fig. 5 shows the Pinnacle screen with the background successfully ingested, and Fig. 6 shows the After Effects screen. Figs. 7 and 8 show the complete switcher and the

It was very simple to add the blanking signal to the control pin of the GT4123. Fig. 1, middle trace shows the CVBS output from the DPS system, lower trace shows the output from the counter chain, and top trace shows the blanked output with L23 WS signalling added.

Success at last!
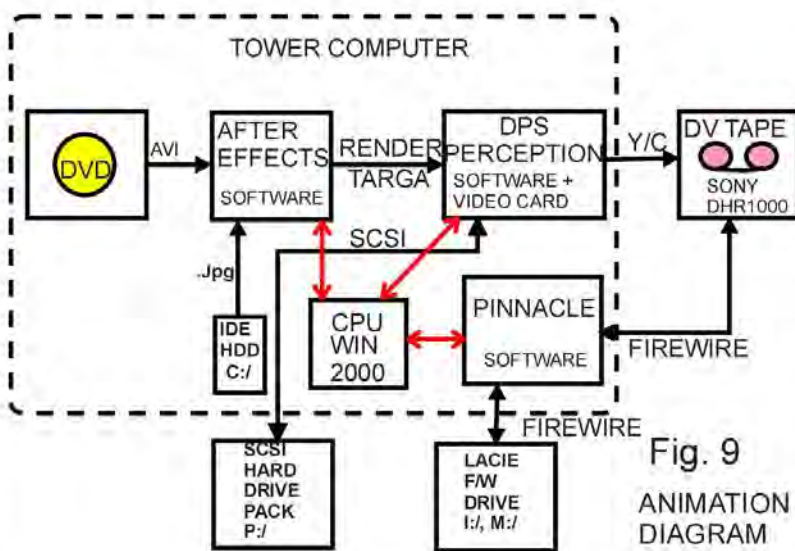
Fig. 9 ANIMATION DIAGRAM

added blanking generator. Fig. 9 shows the interconnections between After Effects, DPS and Pinnacle in the tower editing computer, running WIN2000.

References
CQ-TV 210 May 2005, p.35, Widescreen Signalling

http://www.am-softhome.com
for AVIedit

http://www.footagefirm.com
for backgrounds and stock shots

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Symbol-Rates, FEC and RF Bandwidth

By Ken W6HHC

Using the DVB-S standard to transmit a digital ATV signal involves:

- QPSK (Quadrature Phase Shift Keying) modulation
- FEC (Forward Error Correction) algorithms
- MPEG-2 compression data rates for video
- Video bit-rate needed
- Net Data bit-rate available
- Symbol-Rates
- RF Bandwidth

This article will now walk through these various DATV factors and arrive at determining the resulting RF bandwidth.

Video Data-Rate and Compression

For DATV, the analog camera output is first digitized by the MPEG-2 Encoder board shown in Fig 1, and then compressed by the MPEG-2 algorithm. The information in Table 1 comes mainly from the excellent paper written by Dr Gorry Fairhurst in 2000, called "MPEG-2 Overview". The reason the compressed video data rate varies in Table 1 is that the low value means little motion in the video scene and the higher value means a lot of motion.

Notice in Table 1 that the uncompressed NTSC camera video stream is 168 Mbits/sec, while the uncompressed PAL camera video stream is 216 Mbits/sec. The NTSC video stream data-rate is a 22% reduction from PAL.

Table 1 - Camera Video Data Streams and MPEG-2 Data Streams

Video Data Stream	Data-Rate	Notes
Analog NTSC camera	168 Mbits/sec	A/D digitized, uncompressed
NTSC MPEG-2	2-3 Mbits/sec	compressed
VHS MPEG-2	1-2 Mbits/sec	compressed
Analog PAL camera	216 Mbits/sec	A/D digitized, uncompressed
PAL MPEG-2	2.5-6 Mbits/sec	compressed
HDTV camera	1-1.5 Gbits/sec	uncompressed
HDTV MPEG-2	12-20 Mbits/sec	compressed

Stefan (DG8FAC) of SR-Systems (located in Germany see links at the end) has explained to me that in Europe many hams set the MPEG-2 output data-rate to be 2.5 Mbits/sec for PAL. Stephan further suggests that the MPEG-2 output data-rate for NTSC would be about the same. I still suspect that there should be about a 22% reduction in MPEG-2 output data-rate from PAL, down to about 2.0 Mbits/sec. I will plan for a 2.5 Mbits/sec video stream, but when I finally put together my station DVB-S transmitter, I will measure the NTSC MPEG-2 output to see if the data-rate can be reduced to 2.0 Mbits/sec.

FEC Inflation of Video Stream Data-Rate

Forward Error Correction (FEC) is a technology that not only can detect an error on the received signal, but adds enough redundancy of the data so that it can correct the wrong bit. It can correct two wrong bits. Since redundancy increases the data-rate of the video stream, there is a trade-off between more redundancy and the required video data-rate becoming too large. As we will see a little later in this article, the larger the video stream data-rate, the higher the required RF bandwidth. So at some point the FEC will not have enough redundancy to correct too many errors. Then, if not all the errors are corrected, the DATV screen will eventually go blank., DVB-S commercial television standard uses two different Forward-Error-Correction (FEC) algorithms together in order to provide protection against noise errors and multi-path errors. The first FEC algorithm is called Viterbi. The second FEC algorithm is called Reed-Solomon.

The Viterbi FEC algorithm can be configured for different levels of error correction. Theses different Viterbi configuration/redundancy settings are usually called: 1/2, 2/3, 3/4, 5/6 and 7/8. The first number ("1" in the case of configuration 1/2) is the number of input bits. The second number ("2"
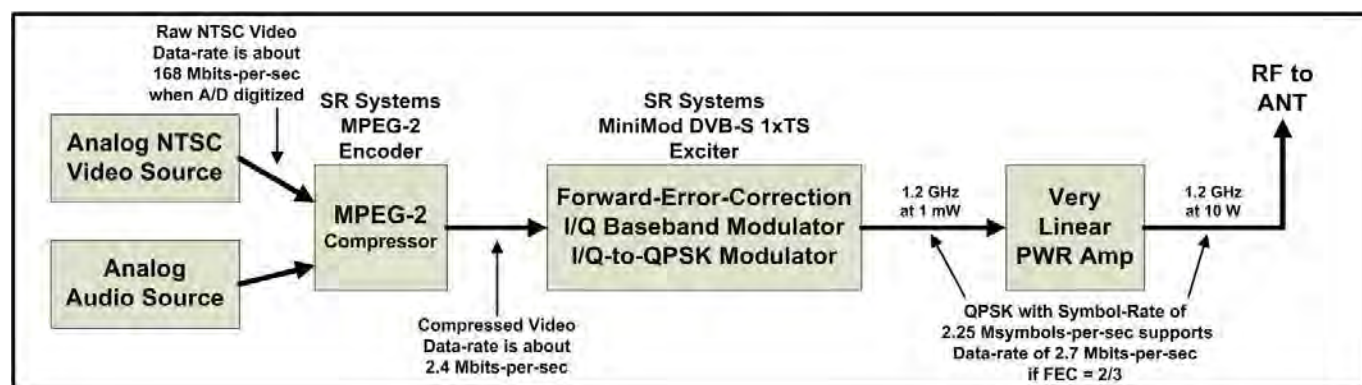

Figure 1 – DATV Block Diagram Showing Various Data-Rates and Symbol-Rates for DVB-S QPSK (for 2.25 Msymbols-per-sec, the Bandwidth is 3 MHz)

in the case of configuration 1/2) is the number of output bits from the FECviterbi algorithm. So the MPEG-2 output data stream is "inflated" 100% by this FEC algorithm configured for 1/2. That is, for every bit going into the FEC engine, two bits come out. A FECviterbi algorithm configured for 3/4, for example, would inflate the MPEG-2 output data stream by 33%. So FEC levels can really inflate the data-bit-rate going to the RF modulator; the MPEG-2 algorithm compresses the video stream, but the FEC algorithms start to expand the required data-bit-rates again.

The Reed-Solomon FEC algorithm has a fixed configuration. Its data stream "inflation rate" is 188/204. So for every 188 bits going into the FECreed-solomon algorithm, 204 bits come out... an additional FEC inflation of 8.5%.

Digital Modulation Symbols and Symbol-Rates

Digital modulation technology like BPSK (for example PSK-31), QPSK (Quad Phase Shift Keying – like DVB-S) and QAM256 (Quadrature Amplitude Modulation with 256 "constellation points") have the ability to put more information into a narrow frequency spectrum than analog modulation. The complexity of the digital modulation scheme, allows us to pack more "data bits" into each SYMBOL. Table 2 lists out how many data bits can be packed into a symbol for several well known digital modulation technologies.

Table 2 - Symbol Bit-Packing for Various Digital Modulation Technologies

Modulation Scheme	Data Bits per Symbol (Me)
BPSK	1
QPSK	2
8-VSB	3
QAM16	4
QAM256	8

This table means that QPSK will pack two data bits into each symbol being modulated. If we know the final output data-bit-rate (I will call this inflated data rate the "Gross Data-Bit-Rate") we need for the television signal, then the "symbol-rate" we need is exactly one-half of that data-bit-rate. For example:

Gross Data-Bit-Rate = 4.5 Mbits/sec

Symbol-Rate Needed = 2.25 Msymbols/sec

The formula to calculate the Symbol-Rate setting that I need for my DVB-S transmitter is:

Symbol-Rate Needed =
NDBR / (Me x CRv x CRrs)

Where:

NDBR = Net Data Bit Rate (aka the information rate) Same as MPEG-2 output data rate in Table 1

Me = Modulation Efficiency (2 for QPSK in Table 2)

CRv = Correction Rate setting for Viterbi (1/2, 3/4, etc)

CRrs = Correction Rate value for Reed-Solomon is 188/204

I will now calculate an example for QPSK where the out-put of MPEG-2 is 2 Mbits/sec and FECviterbi is set to 1/2.

$$\text{Symbol-Rate Needed} = \frac{2.4 \text{ Mbit/sec}}{2 \text{ bit/symbol} \times (1/2) \times (188/204)}$$

$$\text{Symbol-Rate Needed} = \frac{2.4 \text{ Mbit/sec}}{0.921 \text{ bit/symbol}}$$

Symbol-Rate Needed = 2.65 Msymbol/sec

If I change the FECviterbi setting to 3/4, then the CRv value becomes 3/4 and the results are:

Symbol-Rate Needed = 1.73 Msymbol/sec

The Symbol-Rate that is needed was reduced because the "inflated data-rate" caused by a lot of FEC redundancy was reduced. If you look at Table 3 it shows the Net Data Bit Rate that can be supported by a particular Symbol-Rate using several FEC settings.

Table 3 – Net Data Bit-Rates for DVB-S at a given RF Bandwidth

Modulation	FEC Coderate	DVB-S RF BANDWIDTH for DATV (RF BW = SymbolRate x 1.33)					
		2.0 MHz (SR = 1.5 MS/sec)	2.5 MHz (SR = 1.88 MS/sec)	3.0 MHz (SR = 2.25 MS/sec)	4.0 MHz (SR = 3.0 MS/sec)	5.0 MHz (SR = 3.75 MS/sec)	6.0 MHz (SR = 4.50 MS/sec)
QPSK	1/2	~~1.38~~	~~1.73~~	~~2.07~~	2.76	3.46	4.15
	2/3	~~1.84~~	~~2.30~~	2.76	3.69	4.61	5.53
	3/4	~~2.07~~	2.59	3.11	4.15	5.18	6.22
	5/6	~~2.30~~	2.88	3.46	4.61	5.76	6.91
	7/8	2.42	3.02	3.63	4.84	6.05	7.26
		(NOTE-1: NTSC Analog Camera produces about 2.4 to 2.5 Mbits-per-sec of MPEG-2 output for Ham Radio type broadcasts)					
		(NOTE-2: The Net Data Bit-Rate values inside the Table need to be at 2.4 Mbps or larger to support the expected camera data rate coming from MPEG-2 encoder)					
		(NOTE-3: The Net Data Bit-Rate values inside the Table shown in RED (with strikethrough) are Net Data Bit-Rates that will not support the video data stream.)					

The FEC setting needs to result in a number of Net Data Bit Rate that is at least 2.4 Mbits/sec. The red values in the table show FEC settings or Symbol-Rates that result in a Net Data Rate of less than 2.4 Mbits/sec that I set as my goal for MPEG-2 video stream output.

RF BandWidth for DVB-S DATV

It turns out, one of the advantages of digital-ATV is it can be more bandwidth-efficient than analog ATV. With QSPK modulation, you actually have the ability to easily make the DATV RF bandwidth as narrow as 2 MHz or 3 MHz without giving up any noticeable quality. This is because the commercial DTV standards planned to transmit several Television streams inside one normal (old) RF TV bandwidth.

The final formula is for DATV Bandwidth (BW). For QPSK modulation, the formula for RF BW is:

RF BW = 1.33 x Symbol-Rate

This Bandwidth is the spacing that can be used for placing adjacent DATV station center-frequencies. This value of Bandwidth is where the signal is down about -15 dB or more.

The expression "occupied bandwidth" is sometimes used to refer to a bandwidth that is 1.19 times the symbol rate, where the signal is down by approximately -10 dB.

If the Symbol-Rate used is 2.25 Msymbols-per-sec, then:

RF BW =
1.33 x 2.25 Msymbols/sec = 3.0 MHz

If we can use a Symbol-Rate of only 1.5 Msymbols/sec, then the bandwidth reduces to:

RF BW =
1.33 x 1.5 Msymbols/sec = 2.0 MHz

Again, Table 3 provides an overview of what RF Bandwidth you can choose and what the resulting Net Data Bit Rate will be for various FEC selections.

Conclusion

In reviewing the results in Table 3, I have concluded that I will use an RF Bandwidth of 2.5 MHz to support an NTSC MPEG-2 output of 2.4 Mbits/sec by selecting FEC to be 3/4. I plan to put together a DATV station soon. When I do, I will measure the NTSC MPEG-2 video stream that is really required. If my suspicions that I will see a NTSC MPEG-2 video stream at around 2Mbits/sec are confirmed, then I probably change to a 3 MHZ RF BW by using the FEC setting of 1/2. This FEC setting will produce high DATV signal correction capability in one-half of the normal 6 MHz analog ATV bandwidth.

Useful DATV Links

AGAF D-ATV components (Boards): www.datv-agaf.de and www.agaf.de
SR-Systems D-ATV components (Boards) www.sr-systems.de
British ATV Club - Digital Forum www.batc.org.uk/forum/
Amateur Television of Central Ohio www.atco.tv
OCARC newsletter DATV intro article
"ATV - the Digital Fork in the Road" www.w6ze.org/DATV/TechTalk74-DATV.pdf
OCARC newsletter article
"Planning a Digital-ATV Station" www.w6ze.org/DATV/TechTalk75-DATV.pdf
Rob-MØDTS D-ATV site including
details of F4DAY-design www.m0sts.co.uk/datv.htm
Ultimate Resource for
Digital Amateur Television www.d-stv.com

!!! Your Club Needs You !!!
If you do something, anything, related to ATV please drop your editor an email so it can appear in CQ-TV, if you can write an article about your latest project even better!
Repeater groups or individuals, CQ-TV needs your input.

WCM activity day from North Wales

By John Lawrence GW3JGA and Peter Blakeborough GW3PYB

Mid summer was chosen for the ATV activity on the North West Coast of Wales in the belief that the weather should be good for operating from Welsh hill tops. In the event the rain and winds were exceptionally severe. Driving rain in the morning lasted until 1pm then the wind increased to the point it was difficult to hold a long Yagi on 23cm, and dishes, on beam.

Larger dish antenna and larger 2mtre Yagis were not deployable in the conditions.

GW3FDZ/P & MW1WEJ/P at Bwlch Mawr

 For the few hours in the afternoon some contacts were made. Thanks must go to the Telford Group signing GW3ZME with their 3cm and 23cm ATV station who braved the elements to deliver an excellent 10GHz both ways followed by a 23cm contact later in the afternoon.

G3SMU Winter Hill

GW3JGA/PCar boot set-up with the DATV Tx to the left and RX in the centre. The view is of the roof-mounted Alford slot. The video picture was received and recorded as a .wmv file by GW4KAZ using an SL65/12 Digital Satellite receiver (Maplin A94FJ) and a PC. The file was sent in an email to GW3JGA who then played it in 'Real Player' on his PC, paused it (horrible expression) at the appropriate point and photographed it from the monitor screen.

GD1HIA/P

CQ-TV 227 - August 2009

M1EIV/P

GW3PYB/P

GW4KAZ

GW7LWT/P

GW7LWT/P

Phil GD1HIA from the Isle of Man provided a strong consistent signal, both direct, and through the GB3TM repeater.

As mentioned, weather conditions were atrocious, GW8PBX & GW3JGA at GB3TM site, drenched to the skin!

GB3TM site at Nebo Angelsey.

Low power ATV TX on 10.340Ghz feeding the GB3TM repeater just along the road at Nebo.

The opportunity was taken to test the 24cms digital transmitter to be deployed at GB3TM in the future. The equipment was installed in John GW3JGA,s car near the repeater site at Nebo and good results were received over a 24Km path by GW4KAZ from the ground level Alford slot and a TX power of 5W.

The stations operating through the 24cms ATV repeater GB3TM included Derek GW3FDZ/P and Bill MW1WEJ/P at Bwlch Mawr SH 436478, GW3JGA/P on site, Wyn MW0AQZ in Holyhead, Brian GW4KAZ at Bethel SH527663, GW7LWT at Moelfre - Anglesey, GW3ZME at Cefn Du, M1EIV near the A540 on the Wirral, John GW3MEO in Prestatyn and Brian G3SMU Winter Hill.

Martin GW3UKV on his low power 3cm TX

60cm dish on 10GHz at GW3PYB looking at the Wirral

The 24cms output from GB3TM was received at GW3JGA's home in Prestatyn (60km path) and streamed continuously (unattended) to the BATC server in London.

Dave EI2HR in Dublin, a regular ATV station, was unable to take part live as he has antenna problems. However, Dave was able to watch the whole event through the BATC Streamer and managed to obtain over 40 excellent off-screen shots. Here is a selection, all by EI2HR from the BATC streamer David GW8PBX (GB3TM Repeater Keeper) arranged for the GB3TM 10 GHz input to be active to relay longer range contact through a small 25mW ATV tx on the car of GW3PYB, the arrangement worked well but was little used as coordinating longer range

contacts whilst the repeater was busy proved to be difficult.

Later in the afternoon and despite the high winds several contacts were make on 10GHz at a distance of 80Km the erp at GW3PYB was approx. 1KW . The most enjoyable and difficult contact was to G3WVF in the Wirral over an obstructed path, signal received was very weak. Keeping the 2deg dish beam width on bearing in the high wind was quite a challenge.

One of key objectives for the day was to create some ATV activity and provide oportunities for contacts over greater distance, and despite the weather we achieved this objective.

GW3JGA/P

GW3PYB/P 23cm Masthead antenna and 60cm 10Ghz dish with storm clouds overhead.

GW3PYB/P mobile electronics

The list of those seen or heard on the day included:-

GW3MEO…GW4KAZ…GW8PBX… G W 3 F D Z / P … G W 3 J G A / P … M W 1 W E J / P … G W 3 P Y B / P … GW7LWT/P

MW0AQZ…M1EIV/P…GD1HAI/P… G3SMU…GW3ZME/P…GW7LWT… G3WFV

Thanks to all those who participated and in particular those /P stations who braved the elements.

Contest News

By Dave G8GKQ

June Summer Fun Contest

I received 3 entries for the June Summer Fun Contest and there were at least 11 stations active (G4TNX/P, M0DTSD/P, G6GVI/P, G3UVR, G3SMU, G7WFS, G8KUZ, G3SMU, G6AVU, M0YZA, M0MDY). Thanks to all those that participated in what was reported to be both poor weather and poor propagation. The results are below.

Congratulations to John G0ATW and the Grimsby Amateur Television Group. Hopefully this contest will have provided a good equipment shakedown for the September IARU Contest.

Contest Times

A reminder that the September IARU Contest will start at 1800 (UTC) on Saturday, as the timings are set by the IARU. The December Repeater Contest will start at 1200 to give portable stations daylight on both days.

Conclusion

I can be contacted through e-mail (contests@batc.org.uk), or through my BFPO address: Wg Cdr D G Crump, Mailbox Number ACT, BFPO 63, London.

BATC Summerfun ATV Contest 2009 (6-7 June) Results

23 cm

Place	Call Sign	Points	Locator	QSO	DX	DX Loc	Km
1	G4TNX/P	1776	IO93WH	5	M0DTS/P	IO94LI	130
2	M0DTS/P	520	IO94LI	1	G4TNX/P	IO93WH	130
3	G6GVI/P	316	IO83RO	4	G8KUZ	IO83VA	68

Contest Calendar

1800 UTC 12 September 2009	1200 UTC 13 September 2009	International ATV Contest
1200 UTC 12 December 2009	1200 UTC 13 December 2009	BATC Repeater Contest
1200 UTC 20 March 2010	1200 UTC 21 March 2010	BATC Repeater Contest
1200 UTC 12 June 2010	1200 UTC 13 June 2010	BATC Summer Fun Contest

ATV Contests - Hints and Tips Part 3

By Dave G8GKQ

In the previous 2 articles I described how to optimise your station for contest operating, mainly based on equipment that I had built and tested on-air. In this article I will suggest two further ideas, but I stress that they are (as-yet) untested and only partially built!

Assumptions

The following ideas assume that:
- You have optimised your transmitted analogue signal;
- You are confident that the aerials are aligned;
- You are listening on the correct frequency with a reduced bandwidth TV receiver.

Synchronisation

With very weak signals, partial or noisy synchronization (of line and frame scanning) is another source of visual noise that can prevent the all-important contest numbers being read. So, why not synchronise both the transmitter and receiver to the same external source? In the past I have tried this technique using the BBC1 broadcast signal as the external sync source, but this technique does not produce the same absolute reference at each station, and with the demise of analogue broadcast TV, is not future-proof.

A more reliable method would be to synchronise the start of line 1 of the scan to a GPS derived second "tick". This would mean that we know exactly when the transmitting station is starting both its line and frame scans. Using a

GPS derived reference oscillator to run the syncs until the next 1 second "tick" should keep things smooth.

The receiving station could use the same system to lock the monitor, but some adjustments will be needed to allow for the time taken for the signal to pass between the 2 stations. A calculated preset delay will easily take care of the frame sync. A simple calculation reveals that each 19.2 km of path length will add another line of delay. For getting the line syncs aligned, I suspect that a manual adjustment will be required. A coarse 8-position switch (each step adding another 8 microseconds delay) should be sufficient to ensure that all the contest numbers can be seen in the viewable area.

Averaging Between Frames

When looking at noise for Contest Numbers, your brain averages between 2 or 3 frames and thus cancels out some of the noise (I think that it actually multiplies the signal, but the noise does not add arithmetically); so, why not take this further and do it over longer periods electronically?

The system I envisage would sample 256 frames over a period of 10.24 seconds. These frames would get arithmetically added into a "final" frame store each with a weighting of 1/256. So, at the end of just over 10 seconds you would have achieved a 256 times improvement in signal to noise, and have a stored picture (in the frame store) to study for contest numbers.

The frame and line offset to compensate for transmission distance could easily be applied after the complete frame had been received.

One possible drawback of this system would be that aircraft flutter would probably generate horizontal blurring. However, this might not be a critical factor for contest numbers which are big and bold.

Ethical Issues

The techniques that I have described above move us away from traditional moving-picture analogue TV into specialized techniques for monochrome static pictures. They raise issues such as:

- If the picture takes 10 seconds to build, why not use slow scan instead?

- There must be better all digital modes to transmit a picture of similar definition, so why not use them?

My answer to this is that our hobby is all about self-training, and contesting is about achieving the maximum number of contacts over the greatest distance within a defined set of rules. These techniques achieve both of these aims within the current TV Contest rules – I would be pleased to hear of anybody who has tried them for real!

Members Ads

An appeal for equipment and information.

New Lamps for Old, well almost. I'm searching for old broadcast camera kit, the older the better. I have been collecting cameras and related items for a long time now but I have many gaps in the collection that I wish to fill.

Most of my cameras are or will be displayed on:

http://www.tvcameramuseum.org

so have a rummage in the back of your garage and see what might be lurking there! I am also building up the museums reference library so handbooks/ brochures/photos/documentation/BBC bumf are most welcome. Has anybody got early copies of the RCA review? I have a number of duplicate books available for exchanges.

A new project is the building of a database of Outside Broadcast

vehicles and to this end has anybody any information or pictures of BBC scanners? (also ITV).

The BBC numbered their fleet starting at MCR1 to MCR27 and then for colour CMCR1 to CMCR67. It is proving hard to find the registration numbers and relate them to scanner numbers. My scanner 388EXH is MCR21 and, for instance, the registration numbers for MCR13 to 18 are unknown?? Can you help.

As well as pictures and technical information on tvcameramuseum I am adding personal recollections and anecdotes relating to particular cameras, email me if you want to add your story.

Finally I should add a caveat about my museum site, it is far from finished, many cameras and sections are just not there (yet), I keep adding information as and when I can, keep looking and if you are interested in something that is not there yet, contact me, it may well be in

the "in" box!

Brian Summers G8GQS QTHR 01276677879 07740291191 G8GQS(at) summershome.co.uk

WANTED

Plumbicon Slow Scan camera, working. I have a spare tube.

G3NFY (QTHR) or (preferred) oli.g3nfy@virgin.net

Experimental 3D TV Camera

By Mike Cox

INTRODUCTION

3D or stereoscopic TV has been in the news a great deal recently; Sky has threatened to start some transmissions next year, and there is talk of UK 3D transmission during the London 2012 Olympic Games.

Many of you will recall the early cinema showings of 3D where the audience wore cardboard spectacles with red and green lenses – the so-called anaglyph system. The film was shot with two cameras, with lenses at the inter-ocular distance of 65 mm, and printed on colour stock, with [say] the left camera in red and the right camera in green. [Fig. 1 Anaglyph glasses]

It was not a great commercial success, and it was not until digital projection became available that the industry tried again. In the last few years, many cinema films have been made in 3D, and this year, it has taken off, as more and more cinemas have been equipped with digital projection.

How does it work? In our normal vision, each eye sees things from a slightly different angle, and the brain puts these two images together to give a sensation of depth. It follows from this that any practical 3D imaging system has to produce electronically or on film, two separate images separated by an appropriate distance.
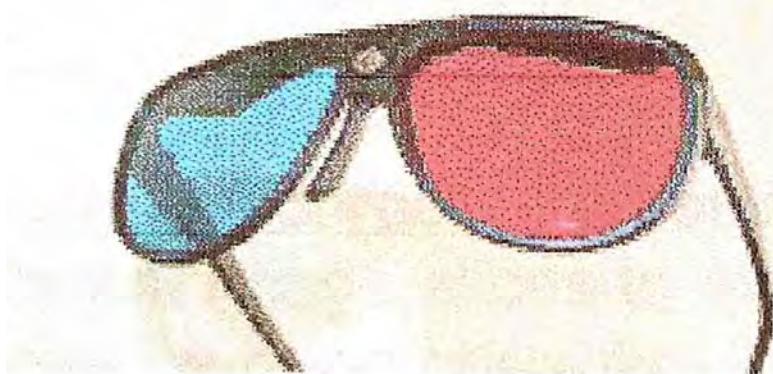
When these images are viewed, they have to impinge on each eye separately. The anaglyph method mentioned above is one way but it gets in the way of a satisfactory colour image. Other methods include the use of polarising filters, either linear or circularly polarised, or LCD shutters. Very small LCD or OLED binocular displays are available. [Fig. 2, LCD glasses]

Dolby has produced an elegant variation on the anaglyph principle. The glasses used have very narrow band RGB filters in each lens, with exclusive differences between left and right lenses; but not sufficient to distort colour in the image. At the projector, a revolving filter wheel carries complementary filters to give the left/right separation. Like polarising glasses, these are entirely passive.

Philips spent some time developing their WOWx system using LCD display panels adapted with lenticular panels so that glasses were not necessary. The idea being that at any viewpoint, the observer's eyes would only see the appropriate image.

This was demonstrated at IBC2007, but recently, Philips have sold the business to another company, which is using the technology for Digital Signage in Holland. The Holy Grail for the 3D business is "autostereoscopy", i.e. the ability to see a satisfactory 3D image on an appropriate display without the use of glasses.

A pair of CrystalEyes shutter glasses

Fig. 2

ELSA Revelator IR LCD shutter glasses

With polarising filters, dual projectors can be used, with filters in front of each, and glasses with appropriate polarised lenses. Alternatively, technologies exist in which the polarising filter can be switched so a single projector can be used.

RealD, a US company, uses circularly polarised filters, and this works well. Others use LCD shuttered glasses, and these are becoming popular with computer gaming in 3D. These glasses are either wired, or more practical for use in cinemas, use Infra Red [IR] signals to control the shutter.

Essentially, a 3D TV system requires double the bandwidth compared with a similar 2D system. Two channels of image have to be transmitted and displayed. The LCD shutter system can work on a field sequential basis. Field 1 can be taken from the left imager, and Field 2 from the right imager. Provided that the LCD shutters are switched at field rate, each eye will see its correct view. The drawback with this arrangement is that a simple arrangement is subject to flicker.

Fig. 1   Anaglyph 3D glasses

The projector or imaging display has to have a short persistence, or there will be crosstalk between left and right, and the 3D effect will be reduced. Many older LCD displays are not very suitable, whereas CRT displays are generally better. Recent LCD displays are more suitable as they have much lower persistence. Samsung offer a 22" LCD monitor with short persistence, bundled with a pair of shuttered glasses for use with 3D games, and is asking about £400 for the kit.

PRACTICAL STEPS

Such is the interest in 3D that it seemed to be a good idea to see what can be done simply. I already had a simple Maplin's CCTV camera, so acquired a second identical one [price was £19.99]. The theory was that they should give identical images.

However, they are not synchronous, so it is not possible to switch between them on a field basis. Luckily, two TV One TBCs were to hand, acquired to modify a 4 input video mixer to handle asynchronous video feeds.

As they have video adjustments, they can be used to match the cameras, I mounted the cameras on an alloy block at 65 mm lens separation, with a ¼" BSW tapped hole in the base for a tripod. A spare 5.6" LCD display was mounted on the block to act as viewfinder. [Fig. 3 Camera Head]

The two TV One units were mounted in a 1U frame, with a 12 volt 5 Amp power supply to power everything. A card has been built to carry a sync separator [LM1881], to provide a field rate switching signal [Pin 7]. The dc sit of the two TBCs is adequately close to be switched directly without adjustment. The switching uses an 'HC4053, and signal is taken to an EL2020 video driver to drive 2 outputs. To aid alignment, switching is arranged so that Left, Right or the switched combination can be fed to the display monitor and/or viewfinder. [Fig. 4, CCU]

So far, so good. Now to get hold of some shuttered glasses. I was promised the loan of a pair of ExpanD IR glasses, but when they arrived, was unable to work out the coded IR signal needed to drive

them. The UK agent could not help so back they went. I then found a UK Company 3D Experience who provide all manner of 3D kit, who sold me a pair of shuttered glasses and the appropriate driver box. This takes in composite video, and produces the waveforms for the glasses. [Fig.5, Glasses and Driver]

The system works! You can see the technology in pictures, but it is difficult to convey the actual results in print. You will have to wait for next year's BGM, when I may bring the kit up to Helidon, Stow cum Quy or wherever it is to be held. [Fig. 6 Viewfinder Shot, Fig. 7 CCU Card]

Flicker is a problem when switching at field rate, also vertical resolution will suffer.

A way forward for the future would be to field double, so that the switching frequency is at 50 Hz rather than 25 Hz. This will require two frame store devices to process the camera signals.

It might be cheaper to go for two projectors and polarising filters, and then more people can see it. However, one attraction of the field rate switching system is that the output is a standard video signal that can be recorded on standard tape or DVD.

One of the things to be investigated is variation of the distance between camera lenses, and toe-in of the cameras. All these will have a bearing on the 3D effect achieved. Another is titling; how to add 2D titling to a 3D image.
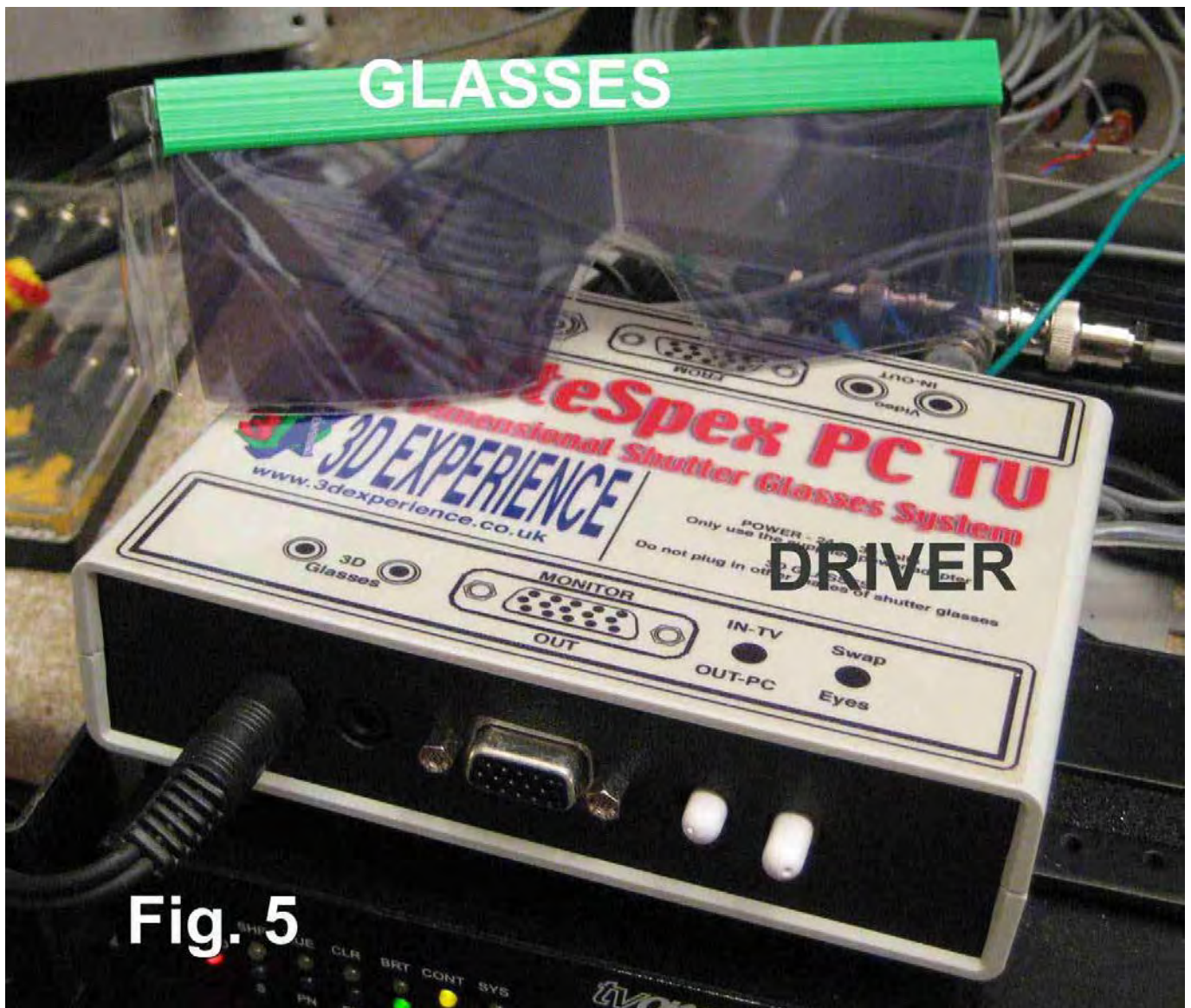
Fig. 5

FIG. 6
VIEWFINDER SHOT
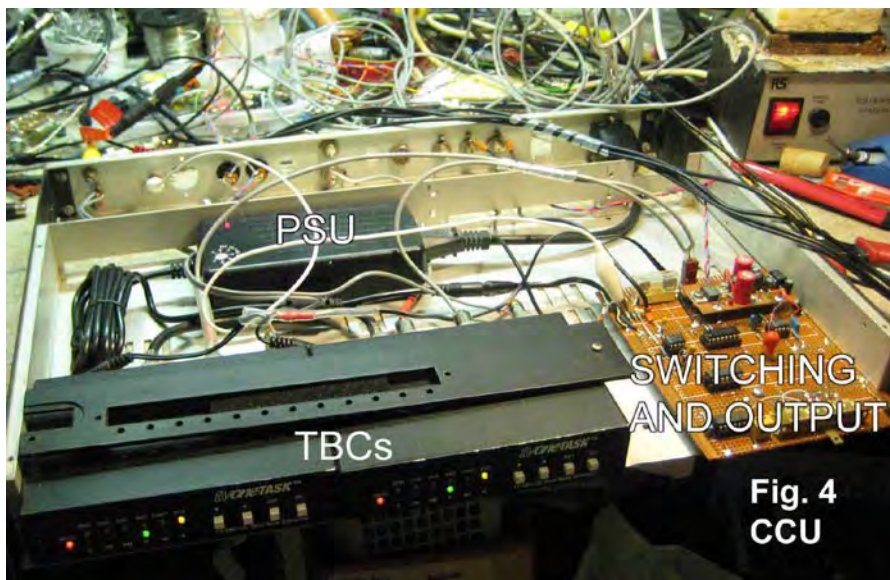
At IBC2007, we saw a U2 concert recorded in 3D [RealD system], and some strange things happened when they tried a dissolve between shots. The brain [or at least mine] took a long while to re-adjust.

Watch this space; with or without glasses.

www.3dexperience.co.uk
for glasses and other items

www.edimensional.com
 for glasses and other items, including a 3D webcam!

www.nvidia.co.uk
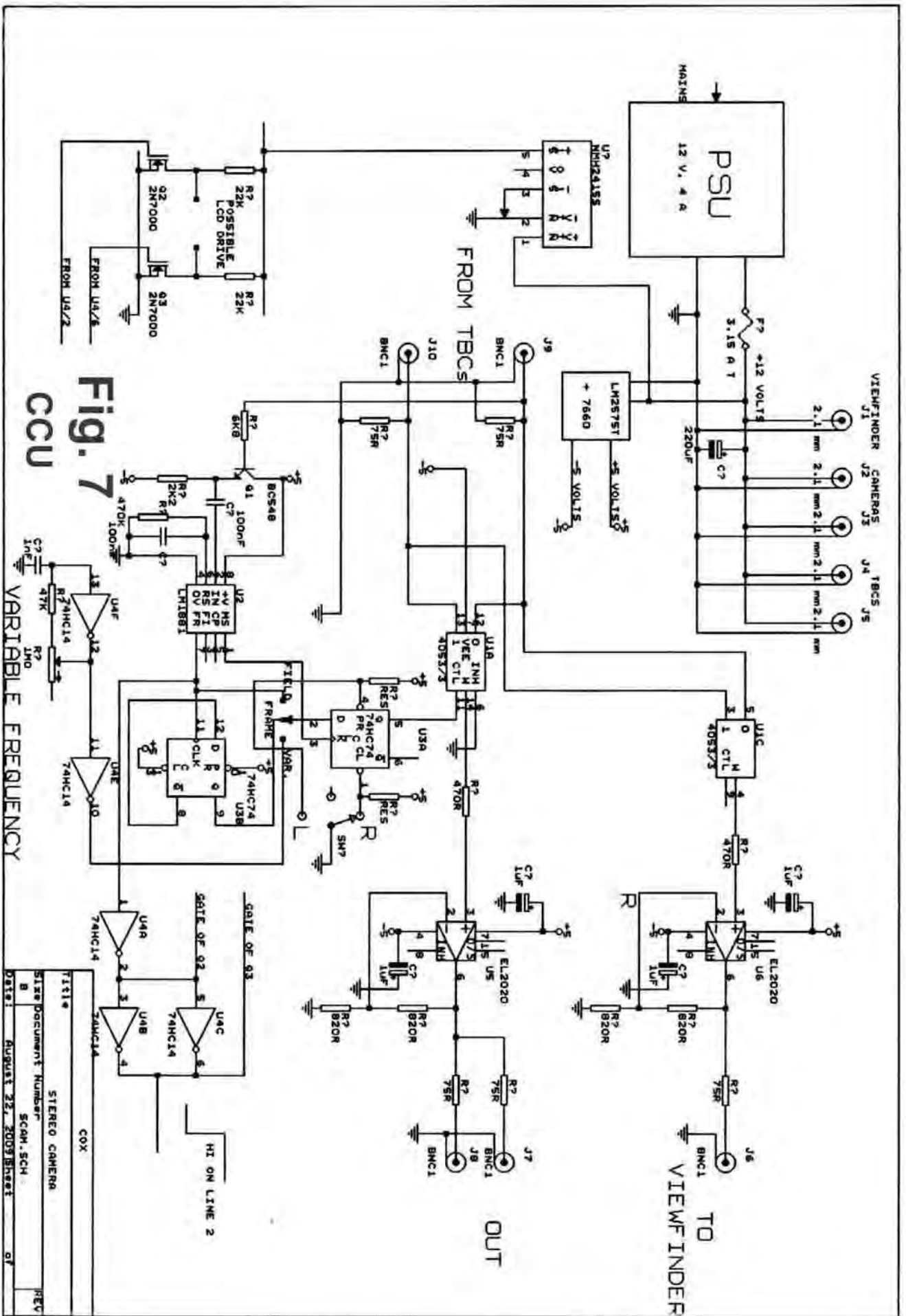for glasses and driver.

http://en.wikipedia.org/wiki/steroscopy

http://en.wikipedia.org/wiki/LCD_shutter_glasses

Fig. 7
CCU

VARIABLE FREQUENCY

Lessons learnt at the AMSAT Colloquium

By Graham Shirville

2008 saw the first attempt by BATC. TV to provide a webstreaming and a video recording facility for the 2 ½ day AMSAT Colloquium that was held at the University of surrey at Guildford. That was before there was any standard equipment available and we were fortunate that Peter Blakeborough had created a "portable" vision and sound mixing desk and was also able to provide three cameras and a recorder. As the event was being held at a University we were spared any problems with internet access. The uplink speed was tested at around 12Mb/s.

This year AMSAT had decided to move their event to the Holiday Inn hotel nearby the Cathedral at Guildford and hold the event only on the Saturday and Sunday. For this event we had the full BATC.TV mixing desk and associated equipment available – Brian Summers had kindly agreed to provide two broadcast quality camera channels and stay to operate them, Mike Cox provided a digital video recorder and AMSAT member Ivo Klinkert PA0IVO had been encouraged to help out on the mixing desk as he had done last year.

The lectures were scheduled to start at 10am on the Saturday and as it was not possible to do any rigging the night before an early 7am start was called for. First lesson learnt – always get in the

night before so the inevitable surprises can be sorted out in a calm and organised way. (AMSAT-UK have booked the room from 4pm on the Friday for their 25th Colloquium being held next year at the same hotel from July 31st –Aug 2nd).

The first surprise was the enormous hum on the audio channel which was being fed from the hotel radio mike/PA system. Luckily Brian had a magic box in his kit which eventually solved the problem but it always seems that the audio side gives more problems that the video ever does.

As an aside for future events, the video encoder feeding the computer that is running the Flash Media Encoder programme produces audio out at line level – this doesn't work very well when using a laptop which only has a mic level input.

The site had been surveyed some months before the event and the hotel WIFI and wired access had been tested for uploads - similar to the results we had previously obtained at Hellidon Lakes! Initial operation of the webstream on the Saturday morning using the wired hotel system appeared ok but of course it fell over almost as soon as the opening ceremony started. The fall back was the hotel WIFI – also ok to start but it seemed to have some throttling limits applied to it which meant it failed again

within a few minutes.

This led us to adopt "Plan C" – use a 3G router with a dongle on a long USB cable near the window. Amazingly, after one false start, this worked fine for the rest of the show. Forward planning meant that we had arrived with a 600mm parabolic dish on a telescopic tripod, the same one that was used to receive the DATV signals from GB3TZ at Hellidon, and this had lots of gain when the dongle was dangled at or near the focal point. By the finish, late on Sunday afternoon the data monitor showed that we had transmitted over 1.8Gb successfully – no wonder it got quite hot!

Other lessons learnt:

We did not use roving mics for the audience questions – it would have taken too long to get the mics to the questioners – much better to remind the presenters to summarise the questions before giving the answer;
Rigging and testing take about ten times as long as derigging;
Monitoring the webstream back from the server to check it is working correctly and to answer questions on the chat screen is an essential activity;
A team of three people is the absolute minimum needed and even then we (I) forgot to load the tape into the recorder for one of the sessions.

The work doesn't end on the day – editing almost 20 tapes and putting them on the BATC.TV "film archive" site takes lots of time as well – thanks Trevor!

But finally don't rely on hotel systems – the Holiday Inn internet provider Ibahn had quoted us >£1500 for a proper SDSL link, that should have told us what the problems were likely to be with their standard offering.

Was it worth the effort – yes of course – some 200+ viewers watched all or part of it from all continents and many words of appreciation were received. AMSAT-UK were delighted and have renewed their sponsorship for another year.

CQ-TV 227 - August 2009

Streaming your own event

By John Bales G0HAT

BATC members can now do what previously only the broadcast authorities could do, namely send live video around the world. These pictures can then be viewed by anyone with a broadband internet connection.

OK so we know this, but it is thanks to the recently introduced streaming service devised by the BATC committee and with special thanks to Chris Smith G1FEF who actually did the donkey work in setting the system up.

There must be many clubs who put on open days and other special events which it would be great to share with those too far away to attend in person. One such event was the Science Week promotion in March this year laid on by Flight Refuelling ARS who put on a number of displays, demonstrating state of the art amateur activities. This seemed like a worthwhile event to stream, with coverage handled by members of the Bournemouth Radio Society.

In order that the viewing should not bear comparisons with watching paint dry, a rolling programme was put on during the day to give those with limited time an opportunity to watch all the demonstrations. Captions notified viewers of the time of the next demonstration and some prerecorded footage was also played out of aspects of the club activities that it was not possible to cover live.

What's needed to do the job?

Sounds interesting but how's it done? In order to send your pictures and sound over the BATC streaming network, you'll need, in addition to a broadband connection to the internet, a computer running Windows XP and loaded with Adobe Media Encoder v3 (downloadable free from the Adobe site) together with an A-D converter from analog audio and video to digital to connect to the USB port. These are readily available at low cost and are marketed for transferring analog from your VHS tapes to digital to save on DVD. You will also need to contact the BATC, for details of how to set up your Adobe software for your event to appear as a "Live Event" stream.

Publicity

It is of course important to let as many people as possible know when the streaming event is to take place so a mention in the main section of the GB2RS bulletin which is read by all news readers throughout the UK and included on the RSGB website is a good idea. The BATC website plans to post details of forthcoming live streamed events soon.

So where do you go from here?

If you wish to stream your event, the BATC can loan you a flight case containing many of the specialist items

likely to be needed such as video and sound mixers, mics, cabling and so on. You will need to provide your own cameras but quite possibly many of you will have camcorders already. If not, this could be the time to invite the local video club to assist with cameras and operators. Their members should be skilled at framing shots and relieve you of the burden of operating cameras.

With a spot of luck they may even have long lengths of cable for connecting their cameras to the video mixer. For sound coverage a reliable radio mic can be a great asset as there is nothing more frustrating for viewers to be able to see the action but not be able to hear clearly what is going on and you can get a radio mic close to the action without extra cables.

Further thoughts

The BATC has a very powerful tool here with its streaming capability. It already streams lectures of interest to ATVers. Should we be considering widening our scope and offering coverage of some of the lectures presented at events such as the RSGB Convention in October?

It could be argued that such coverage would detract from attendances of the events or maybe it would be seen as bringing these lectures to a far wider audience than could ever attend in person. Many of the speakers at such events are after all experts in their field.

But is this ATV some of you may be asking? The remit of the BATC is to include all things connected with TV and ATV surely. There will be those interested in restoring ex broadcast equipment, editing video, exchanging testcards from windy peaks in the hills or working out just how many fans are needed to keep that big new PA cool, so why shouldn't streaming join the group. ATVers of the world unite…well at least we can all now see each other.

The digital test transmission from Mt Dandenong east of Melbourne today (7 June 2009) went exceedingly well with at least eight stations receiving the VK3RTV repeater signal noise free.

The test, using German made commercial quality DVT-B standard digital television boards, began at 11am (AEST or Melbourne time) with colour bars enabling viewers to tune their set-top boxes.

There was obvious delight in the voices of those reporting confirmation of their reception via the 2-metre 147.4MHz ATV liaison frequency.

Similar to the 1956 start of TV in Australia through TCN9 Sydney presented by Bruce Gyngell, the new era of digital amateur television was officially launched.

Amateur Radio Victoria President Jim Linton VK3PC announced to camera "Welcome to Television, Digital Amateur Television VK3RTV."

Peter VK3BFG with the new DATV VK3RTV Peter Cossins VK3RTV was operating the camera and dubbed Jim VK3PC as 'the first face on digital amateur television'. Peter Berrett VK3PB held the 'script sheets' of the opening address.

It referred to Australian radio amateurs having a long history of experimenting with various types of television transmission, and them publicly demonstrating it before TV officially began in September 1956.

The arrival of digital amateur television is an outstanding achievement, occurring at the same time as commercial and ABC stations are just finding their way with the same digital medium.

Recognition was given to Peter VK3BFG for having the dream to digitise one of the world's longest established fast scan amateur television devices. That dream not only became a reality today but an instant success.

The digital transmission was received at Vermont, Burwood, Woori Yallock, Delahey, St Albans, Moorabbin and Phillip Island.

Commonly used to pick-up the signal was a domestic set-top box (STB) tuned to 446.5 MHz. One viewer saw it using a miniature USB DVB-T receiver connected to his computer.

The digital signal was reduced to 2-watts and still received by many, but mostly ran at about 8-watts during the test.

At least six others were without a working STB. Peter VK3BFG notes that a manually tuned model STB is required.

A list of suitable STB is being compiled. Another option may be a simple converter so VK3RTV can be received on a vacant digital TV channel.

During the test transmission viewers saw the digital broadcasting standard DVB-T boards and associated equipment, painstakingly put together and pre-tested at the QTH of VK3BFG.

Major project funding comes from Amateur Radio Victoria. The WIA Club Grants Scheme provided $1,000 in recognition of it being a high quality innovative project. Volunteer support has also been important to its success.

Work on the project continues with the next stage being the controller to do all of the switching necessary to manage the complex system that will have two independent channels and three inputs.

News of the VK3RTV DATV project has sparked interstate and overseas interest. A detailed article will in time be published in the WIA journal Amateur Radio magazine.

http://www.amateurradio.com.au/node/660

In Correspondance

By Dicky Howett

Dicky Howett replies to emails. The following are a few somewhat disconnected answers to several 'historical' tv queries, posed to Dicky over the internet and indeed the millennia.

A query about when the first 'portable' tv camera arrived

What is meant by 'portability'? Is it just the camera or do we actually mean able to 'record' in one package? If so, this emerged first in the early 1980s with the RCA 'Hawkeye' and Sony 'Betacam' and Bosch portable cameras. These cameras were independent of an external recording medium, each camera containing its own recorder, in other words, a 'camcorder'. Prior to that, in the 1970s we had Ikegami, RCA (and others) with portable cameras which needed a separate recorder, joined umbilically. Back in the early 1950s the Vidicon camera arrived such as the 'Creepie Peepie' in the USA or the French-designed 'Radio Camera'. This camera was a combination camera/

backpack and was 'portable' inasmuch as the long suffering cameraman could move about. The camera was very small and thus it could roam at will, transmitting an image on the move. These vidicon cameras were used at sports events and at other 'actuality' locations. Picture quality was marginal, but there is no doubt that these portable cameras were used. Incidentally the weight of 1960s tv cameras: For example an EMI 203 (monochrome camera) was 108lbs (without lenses). Colour cameras were heavier. The EMI 2001 was 160 lbs (without the very heavy zoom lens).

In reply to a student writing a thesis

I don't think audience fragmentation is much of a concern. The big tv shows will always get the audience. Notice also that all the major outlets are owned by relatively few operators. If you own the ice-cream stall your customer base is always there however many flavours you sell. Modernisation: The big thing now (written in 2001) is digitisation of the broadcast signal. In the US all receivers must eventually be equipped

to get the signal; all channels broadcast in digital. This would certainly improve the US NTSC analogue colour system which is prone to shifts in hue. In the UK nation-wide digitisation must happen by 2010 (it was 2006 but this has slipped because the take-up of digital set-top box converters (at £100 each) is quite slow. Each tv set must have its own converter of course. In my home alone that would mean 4 boxes!! Digital tv means more channels or a better image (not both- the BBC actually reduced the number of channels on its digital 'Freeview' tv service in order to improve the received signal). Also high definition. As screens get larger, then a better line rate would be advantageous. However it's up to the customer to decide what it wants. Recently, (again in 2001) ABCtv abandoned their wide screen high definition sports coverage because there were no viewers willing to buy the expensive widescreen hi def tv sets in order to receive the broadcasts! That's the trick really. No amount of second guessing will be of any use unless the viewer is able and willing to 'buy into' tv technology. One has only to look at all those technology 'predictions' made over the years. For example, by 2003 we should all have videophones, personal helicopters, wall-sized tv screens, solar heated homes. All possible and available today of course, but hardly any of us have any of the aforementioned. However, we ALL have colour tv sets, VCRs, deep freezes, microwave ovens, something we were all willing to 'buy into'.

I'm sure your local library will have books covering all of this. However as the screen-writer William Goldman once remarked "nobody knows anything".

All guess work.

Somebody asked about tv outside broadcasting

As the title suggests, television broadcasts that come from outside the studio. Live pictures of sporting or festive occasions, news and catastrophes, all from outside. Sounds uncomplicated,

but in reality the technical set-up can be every bit as involved as for studio productions. Perhaps even more so, because an entire high-quality broadcast chain has to be carted from the cosy confines of the studio, out into the unforgiving elements. For example, if the broadcaster was covering a football match then the remote vehicle would typically weight twenty-tons, be 35ft long providing 18 video cameras, 50 wide screen colour production monitors, a 96-channel digital audio desk, a digital video editing area and a vision mixer.

Remote or outside broadcasting began in the early nineteen thirties. On 8th May 1931, Scottish inventor, John Logie Baird loaded a mechanical 30-line picture scanner into a wood holiday caravan, trundled this into the street outside his workshop and broadcast (if only a few yards) an image from 'outside'

Later, that same year on the 3rd June, Baird took his tv caravan down to Epsom and relayed live scenes from the Derby (the first sports OB) via the BBC medium wave transmitter at Brookmans Park. A bold technological feat considering the totally uncharted tv territory and the haphazard nature of the telephone lines that linked the system. The pictures of the Derby (actually just the winning post area) were barely recognisable due to electrical interference and the low band-width used. But a precedent had been established. o.b.'s worked!

Later, at the 1936 Berlin Olympic Games, the German experimental tv service used two o.b. vans feeding a mixture of 180-line electronic and intermediate-film pictures. But the

first all-electronic high definition 405-line outside broadcast unit was built in 1937 for BBC Television. The unit comprised two Regal vans built by AEC of Southhall and equipped by the Marconi-EMI company. A third vehicle carried the 1 kw VHF link transmitter. The unit supplied all the necessary control apparatus. This included two

vision monitors and four microphone inputs. Three Emitron cameras supplied the pictures and on May 12th 1937 the unit televised live the Coronation procession of King George Vi. With outside broadcasts such as described, early television established an audience,

and importantly, sold sets.

In America, by the Spring of 1938 RCA had in New York built a 'Telemobile Unit', shaped like a single-decker passenger bus. This unit experimented by shooting scenes around New York City using two recently-developed RCA cameras with miniature (4 1/2" inch) iconoscope pick-up tubes. The remote unit proved very adaptable and much experience was gained by the operating engineers from NBC. During a transmission from a swimming pool, the remote cameras panned away and captured a fire in a deserted army barracks along the East River. This event (which was photographed from the screen) made press headlines and was later credited as being the world's first unscheduled tv news event.

In reply to a crappy internet article about John Logie Baird and early tv

Dear ……

I'm Dicky Howett, one of the trustees of the Alexandra Palace Television Trust. (written in 1998) I hope therefore that I know a little about the history of British tv and in particular, John Logie Baird. Your article contained a certain amount, of what we in the scribbling trade call 'cobblers'.

To start, the Palace is Alexandra not Alexander. Gender change is not on the historical agenda. Also, it was the Crystal Palace that burnt down in 1936 not Alexandra Palace. Tut tut! AP has caught fire twice it's true, however nothing televisual was ever destroyed and the studios remain there to this day, albeit unused and dare I say it, derelict. There, I dared! And then we have that
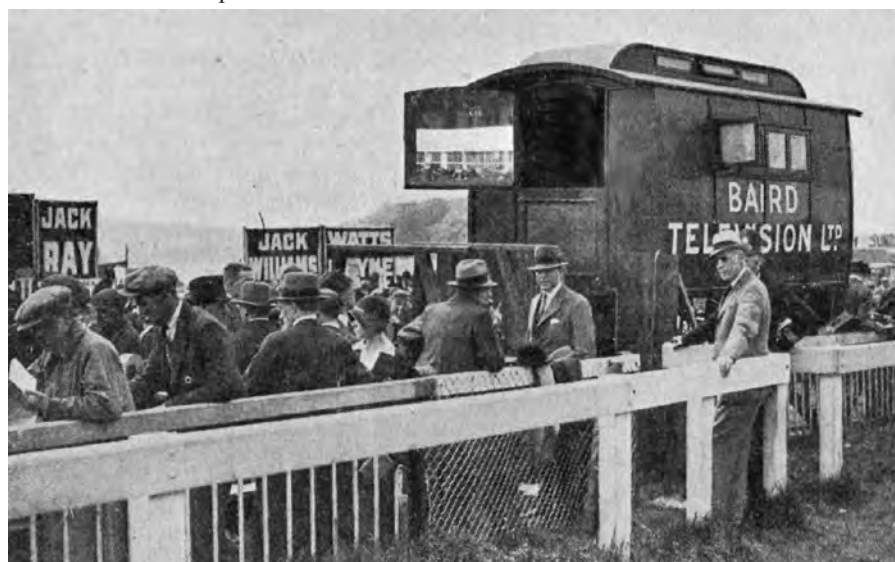
oft-repeated rubbish about the Baird 'eyeball' experiment. (Baird is reported to have used a live eye plugged into his apparatus) The story's apocryphal. Baird did perhaps fleetingly contemplate using human optical organs, but remember also, Baird was a master of publicity. His 'inventions' included a good few stories likely to appeal to the headline-hungry press. Baird's first official scientific demonstration of his television system before members of the Royal Institution (not Institute) was given in Frith Street London on Jan 27th 1926.

Your facts and chronology also beg further refinement. Pirandello's play (The Man With A Flower In His Mouth) was broadcast for the BBC on 30 lines not 240. It came from Baird's Long Acre studio on July 14th 1930. The 'camera' was a mirror drum flying spot. The last BBC mechanical 30 line service transmission went out at 11pm on 11th Sept 1935. (not August 1936)

The BBC then shifted television to Alexandra Palace where two first floor former banqueting halls 30ftx70ftx25ft were converted to tv use.

The Marconi-EMI all-electronic 405 line system occupied Studio A and the Baird systems (240 lines) consisting of an intermediate 17.5mm film and a Farnsworth camera, occupied studio B, with a small spotlight studio in-between. Baird had also a quite good flying spot telecine. The Baird mechanical service at AP was discontinued in Feb. 1937. Studio B was then re-equipped with Emitron electronic cameras.

Dicky Howett 2009

Dicky Howett writes, "I came across this photo which shows in 1971, a Philips LDK13, of which only a handful were built. At first glance I thought the photograph was of some exotic form of rural torture. But this demonstrably is not the case as the cameraman isn't wearing the back- pack harness, cable and control unit".

From the Howett Family Album. 'Like we always say, tv was better in the old days'.

Letters to the Editor

Polarity on ATV Talkback.

Hello,
Up here in NE England there are keen operators who are interested in ATV contesting especially out /P.

What we have noticed over time is that some stations use either horizontal or vertical on the 144 MHz talkback frequency. This has lead to difficult talkback and probably failed "CQ TV" calls as well.

The question is, who is correct? I know there is no easy answer here! We prefer horizontal when out portable but would be happy to change to vertical if that is the consensus.

Thoughts please?

Eddie - G0EHV

My web page:
http://www.g0ehv.btinternet.co.uk/

In September G4ERP will be taking part in a hill climb at Prescott near Cheltenham. I would like to invite any individual or group who has experience of linking live tv from mobile sources to contact me with a view to televising the various runs he makes.
We have been officially approved by the organisers and are seeking equipment and experience people. I did this sort of work for BBC tel OBs in the past.

Help!

73
Giles Herbert - G0NXA

Phone: 07769 658041
Email: g0nxa@hotmail.co.uk

Hi,

I came across this on internet, and it look's very interesting:

http://fabrice.bellard.free.fr/dvbt/

have a look?

Regards,
P G Mc Farland - GW7BZY

A QUITE UNEXPCTED BONUS

It is well known that the simple FM transmitters, used by some ATV stations, have a very poor low frequency response. Depending on picture content this can lead to serious waveform distortion with the loss of vertical and sometimes horizontal synchronisation. I was watching pictures from a station using one of these recently via the GB3PV repeater and the problems were much in evidence.

Using the DTMF control, I switched the repeater output from analog FM to digital. As well as the colour improving as one would expect, due to not then having two bandwidth limited FM links in cascade, the waveform became almost perfect and the synchronisation excellent.

I can only conclude that some circuitary in the MPEG coder, the QPSK modulator or in my STB, perhaps a combination of them, was acting as a black level clamp and correcting the signal.

As I have no idea about the inner workings of these units I have asked Uwe Kraus if he can explain. At the time of writing I have not yet received a reply, but when I do I will pass it on to CQ-TV.

73 Ian Waters - G3KKD

BATC Publications and Members Services

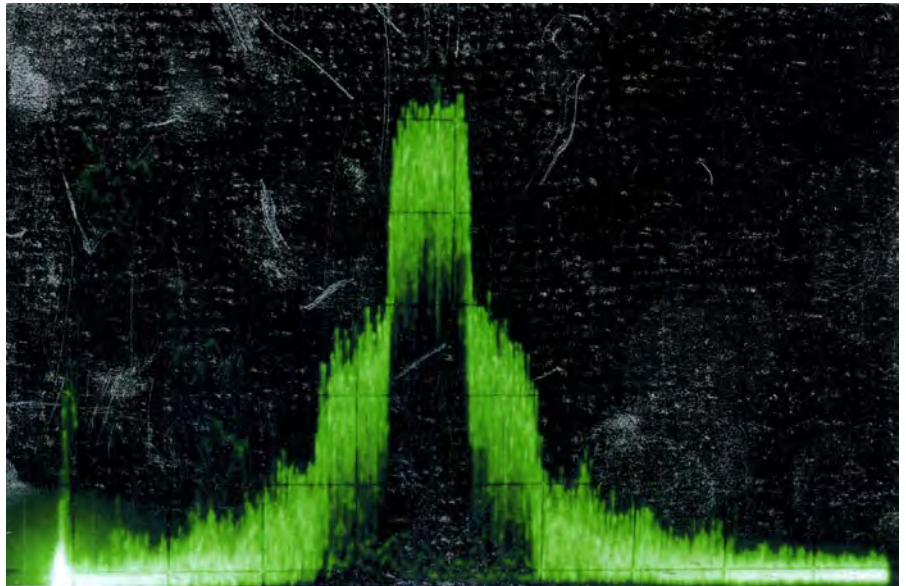| Publications	Each	Qty	Total
An Introduction To Amateur Television (225gm)	£2.50	....	....
The latest handbook full of detailed information on how to set up your ATV station, plus lots of new video and RF construction projects.			
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A compilation of the best construction articles from CQ-TV's 133 to 146			
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Tests on a 23cm Power Amplier

By Ian Waters G3KKD

RSGB Radcom June 2009 carries an article by John Worsnop G4BAO describing a 45 W solid state amplifier that he has developed for use in the 23 cm band.

This amplifier, which uses a single MRF 9045 LDMOS power FET biased in class AB, has a gain of 13 - 14 dB and delivers 40 - 50 W output.

The unit, excluding its heatsink, is very small and compact being only 72 x 55 x 30 mm. The heatsink, which must dissipate up to 50 W, may be either small and assisted by a fan, or larger for silent operation in the shack. If a small fan assisted heatsink is used the whole assembly could be masthead mounted.

It requires a 28 V supply capable of 4 A and a 12 V supply for the bias, which may be easily obtained from the 28 V using a regulator. It is a modern replacement for the 2C39 valve amplifier without the hazardous high voltage supply.

Although originally developed for 23 cm communication use, the amplifier clearly has applications for ATV both FM and digital. I was therefore asked if I could test it using my QPSK drive. John provided a prototype amplifier tabbed (optimised) for operation on 1249 MHz. I fed it with 2 W of drive and it delivered about 45 W while drawing 3.3 A at 28 V. *(Photo: inside back cover - ed)*

As will be seen from the photo above my drive is not very linear (I really need to improve it!). First order spectral re-growth products taper from about -22 to -30 dB. The photo below shows the output spectrum at 45 W. It will be seen that while the first order products have not degraded, the higher orders have become somewhat worse at -40 to -50 dB.

It would seem that this amplifier could be used for QPSK DATV and if driven with a cleaner drive would give a quite satisfactory result. For detailed information on the design, construction and testing of this item please consult Radcom.

I am most indebted to John for the loan of his prototype and for assistance in carrying out the tests.
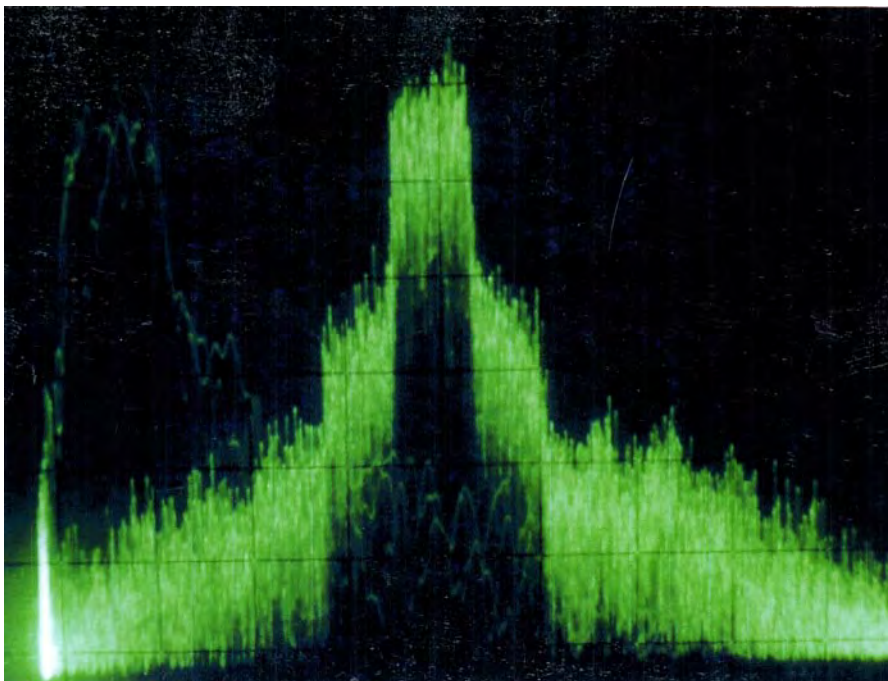
The Quadrocopter

By Brian Summers G8GQS

This was flown by Tilman Glotzner during a gap in the proceedings at the recent Amsat convention and it attracted a lot of interest. Four electrically driven propellers provided the lift and they were stabilised by "electronic rate gyros", it seemed to be relatively easy to fly! It was small and stable enough to fly indoors as well as outdoors. The payload was a small, off the shelf, TV camera and it's built in transmitter, powered from a 9-volt battery.

Seeing it hovering a few feet away was slightly unsettling, it resembled a cross between a prehistoric dragonfly with it's glinting LEDs, and a hedge strimmer.

The pictures were received and fed into the vision mixer that was providing the BATC streamer service and hence on to the world. Is this a first? One of the cameras that was covering the Amsat meeting was turned round to see the Quadracopter and alternate pictures of the Quadracopter and it's onboard camera were shown as full screen and as "picture in picture". The recording of this is now available to view on the BATC streamer service. See www.batc.tv and look in the "archive button"

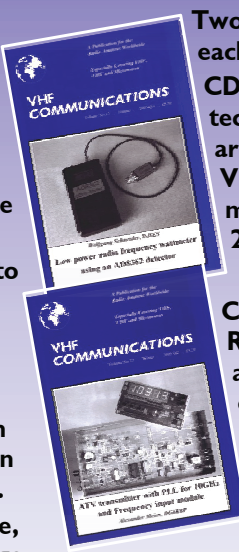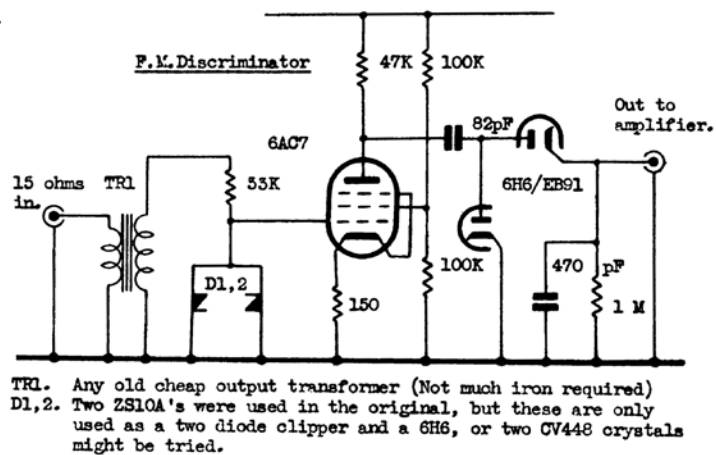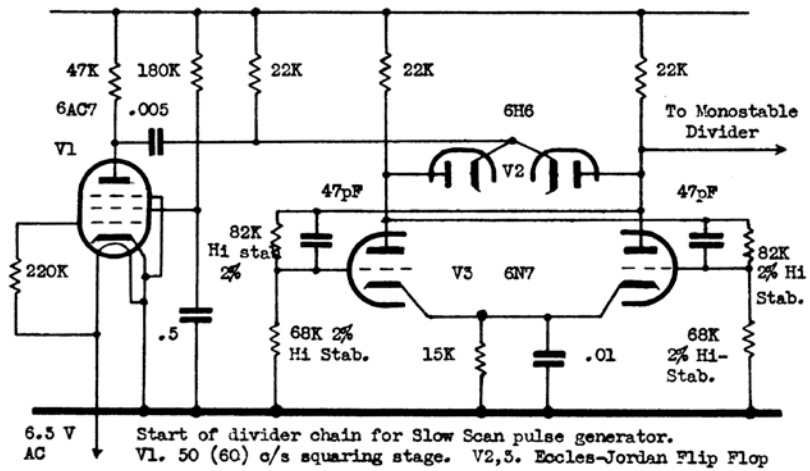*(Take a look at the inside back cover for more photos, ed.)*

A dip into the archives of CQ-TV, looking at the issue of 50 years ago.

By Peter Delaney

CQ-TV 41: This issue did not carry a date of publication, but was issued in late 1959. John Tanner's editorial began "This edition of CQ-TV marks the tenth anniversary of the magazine. The first edition was published in November 1949 and consisted of several duplicated sheets stapled together. Since then the club has expanded and the circulation of CQ-TV has increased from under 20 copies to around the 600 mark. It is hoped that sometime next year CQ-TV will take on a 'new look' and appear as a printed publication. The number of editions per year is limited by the amount of material available for publication, so if you could find time to write a description of some item of equipment, then each edition could be enlarged or an extra edition published." (Some things never change !)

In mention of the Radio Hobbies Exhibition, John commented that the first of a series of technical publications would be available (this one was on the basics of slow-scan television), and that "in due course a complete series of these publications will be available to enable club members to obtain information on different subjects without having to refer to back copies of CQ-TV". (These were the precursor to the popular club 'handbooks'). Elsewhere in the magazine, a short note says that "All 525 line members should have received the 525 line newsletters from Mike Barlow" - do any of these still survive for the archives ?

The back cover carried a 'newsflash', relating to the 'First Transatlantic Amateur Television Transmission'. This had taken place on November 22nd 1959, at about 3pm, when 'Pluff' Plowman, G3AST, received a direct slow scan transmission, via 29.5 MHz short wave. The signals were recorded onto magnetic tape. Although the picture quality was described as 'poor', the tuning wedge and WA2BCW's callsign could both be recognised, and the event

Start of divider chain for Slow Scan pulse generator.
V1. 50 (60) o/s squaring stage. V2,3. Eccles-Jordan Flip Flop

F.M. Discriminator

TR1. Any old cheap output transformer (Not much iron required)
D1,2. Two ZS10A's were used in the original, but these are only used as a two diode clipper and a 6H6, or two CV448 crystals might be tried.

was said to be an "all-time ATV first" and "a milestone in the development of amateur television activity." One of the shorter technical articles included two of the slow scan circuits developed by G3AST, and was accompanied by an off screen shot of a slow scan picture that Cop Macdonald (WA2BCW) had sent previously on tape.

The other technical articles included one on the basics of 'Negative Feedback Amplifiers' - CQ-TV - the magazine often included 'teaching' notes such as this at that time. It began " Amplifiers using negative feedback can achieve low distortion, good frequency response and gain stability unobtainable in any other way. It is therefore a little surprising that so many BATC members seem to be nervous of negative feedback." The article went on to explain how the frequency response of an amplifier could be "controlled by judicious use of negative feedback". It added "For those

members without a sweep generator (!), the best way to set up a frequency response is to look at the edges of a pulse." The author (not named) also gave some hints on how to 'fault find' in feedback amplifiers.

The major technical article, however, was a timer unit for the 'BATC sync generator', designed by Mike Barlow. It was capable of being genlocked, locked to the mains, or allowed to free run, and consisted of master oscillator and a series of counters. It could be set up for 405 line/50 field, 525 line/60 field or 625 line 50 field systems - the diagrams showed the 525/60 version, but the text included the counter ratios for all 3 systems. (Mike at the time living in Canada). There were no printed circuit boards for the project - the 'layout plan' being shown in 'figure 4' being the wiring between the valve bases and controls (the row of circles) and a 'tag board' (the rectangular area drawn as

the top half of the diagram) that was set at right angles to the bases. The 5 small resistors shown along the top of the tag board, connected only at their lower end, were provided as 'test point' connections. The complete circuit would use about 25mA at 200 - 250V HT supply (not to mention the heater supplies!)

(Some things do change - Brian Kelly's spg in a bnc plug in CQ-TV 226 does almost the same as this - lacking just any external locking !)

The magazine included the usual 'What the Other Chap is Doing' page, with reports in this issue from members in France, Brentwood, New York, St Albans, Devon, Western Australia, Nigeria, Cyprus, Ghana, Yeovil, Chelmsford, Ohio, Cambridge, Essex, Bristol, Ross-on-Wye and Welwyn Garden City. Those 600 members were widely spread around the globe!
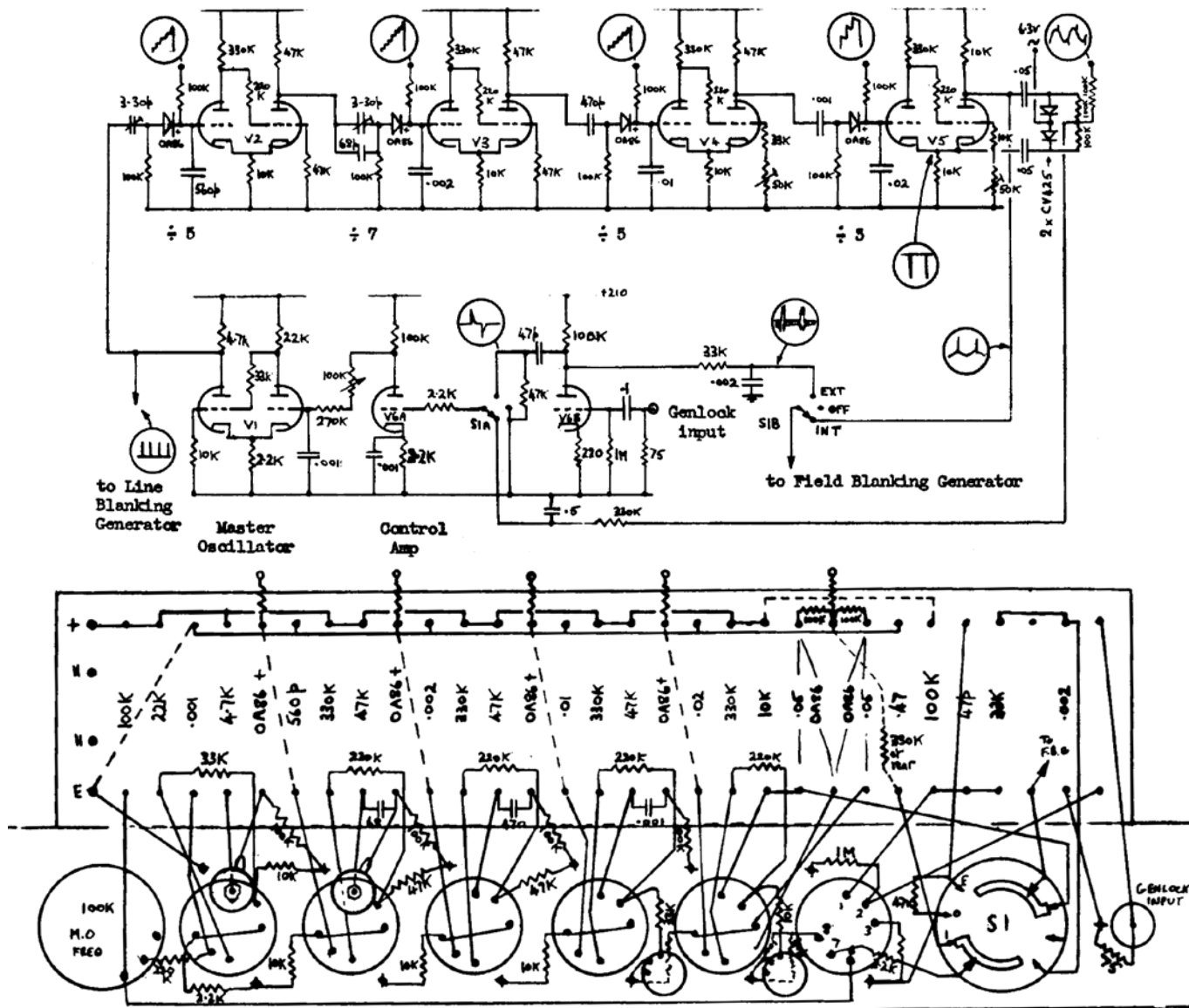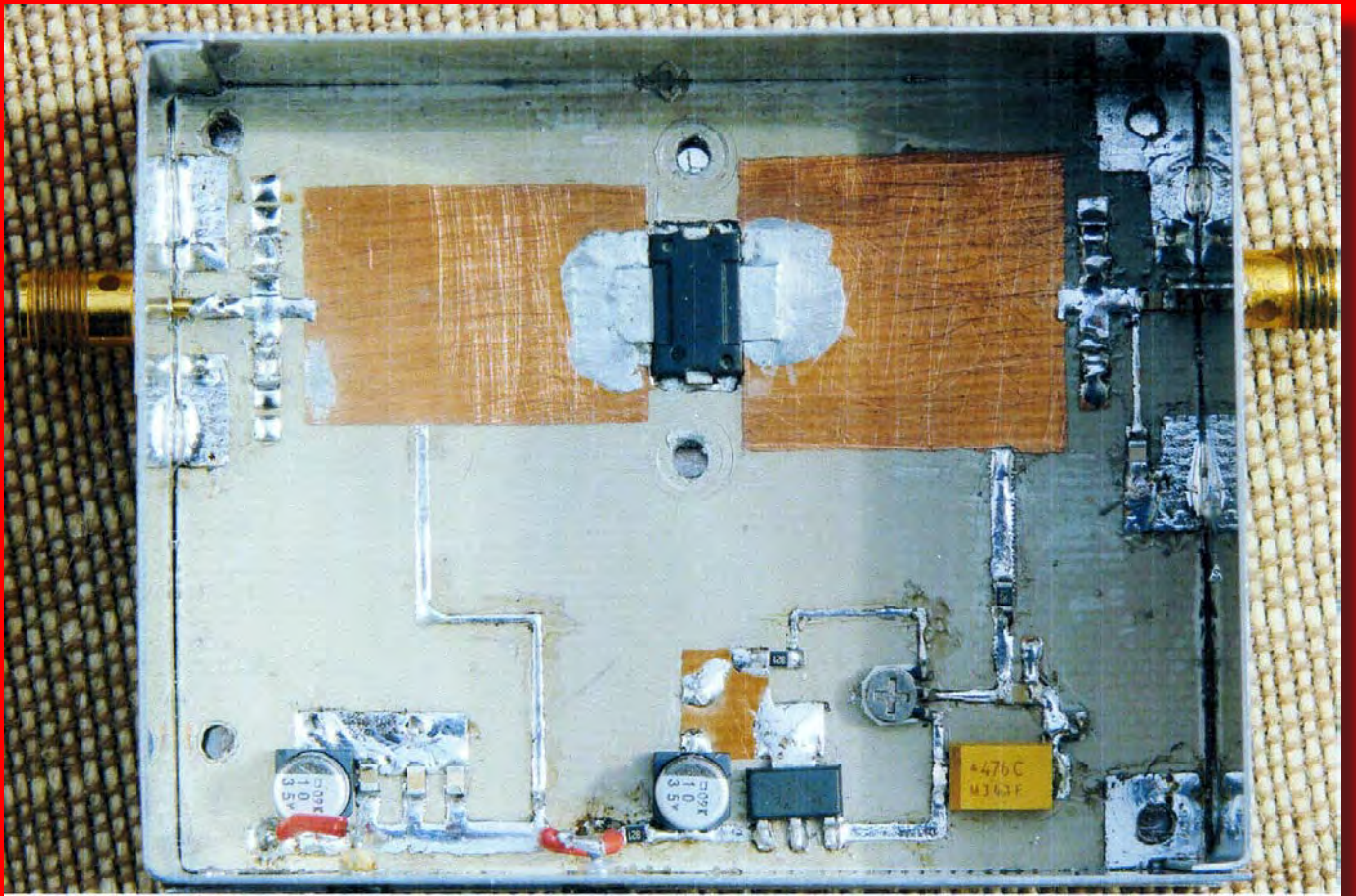
Home made 3-tube plumbicon

Trevor hasn't a clue what Heinz and Tatjana just said, but he keeps grinning and nodding his head

So that's where Trevor hides his wallet!

Stooky Bill pays attention to the lecture on NBTV