



# CQ-TV

# 223

## Streaming Special

**batc.tv** Digital Television

BATC Subscriptions now start at £4  
Subscribe on line via Pay Pal

Username:   
Password:   
Forgot login?

To stream your ATV repeater here free of charge, please [Contact Us](#) today!

You are watching the live stream: GB3ZZ

This is a "live" stream. If the player on the left is "blank", it is most likely because the person or group responsible for this stream are not sending anything at the moment.

17/08 21:13 GW6SWX I'm going to try something. Click on "multi screen selector", you can now select from all streams. I'll try to be on myself in a moment

17/08 21:16 G1IKZ ok

17/08 21:37 G6ADR Monitoring

17/08 21:38 G6ADR Time appears to be out?

17/08 21:42 GW6SWX Time is based on Buckinghamshire standard time, not GMT !

17/08 21:46 G1ike Brian can you send the email again to me have'nt got it sorry I took so long been on the phone to CAZ

17/08 21:47 GW6SWX I didn't send it myself - go to the new web site and try filling in the form. Put your real email address in the box!

17/08 21:48 GW6SWX I'm off to watch TV, back in an hour or so.

17/08 21:50 GW6SWX Email me on the usual address if you don't get a reply from the web site.

19/08 19:18 G1IKZ TEST

19/08 19:16 G1IKZ testing the page

19/08 22:17 G1P13 Watching ZZ !!

Multi screen selector

GB3ZZ

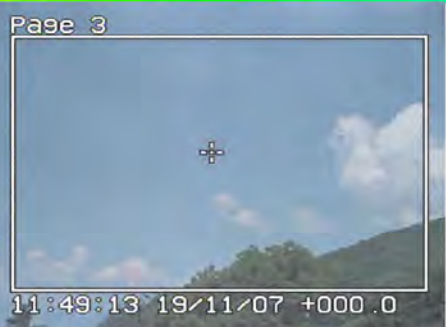
Please enter your call/sign or name (max 8 chars) in the left box, type your message in the right box then press enter or click on Send

Sevenside ATV Group operate two amateur Television repeaters GB3ZZ location Filton north Bristol and GB3XG location south Bristol, Sevenside Television group also organise the west of England radio rally to be held at Frome, Somerset on Sunday the 28th June 2009.

For West of England Radio Rally [www.westrally.org.uk](http://www.westrally.org.uk)  
For information on the Sevenside Television Group [www.stvg.co.uk](http://www.stvg.co.uk)



# PIC On Screen Display Project Board



- 4 text pages
- Real time clock
- Counter input
- PS/2 connection
- UK or US key layout
- Colour / mono video
- PAL and NTSC
- Board only option

The BlackBoxCamera™ Company Ltd. sponsors the CQ-TV caption competition. The winner will receive a keyboard text overlay unit.

## GPS video overlay units

Display GPS data on any composite video signal

51 30.2584N 000 04.5733W  
 07:52:52+01 03/06/07  
 PIC-OSD 12.6M  
 15.8 mph 23.20°

**PAL - NTSC compatible**



Visit [www.PIC-OSD.com](http://www.PIC-OSD.com)

## Caption Contest

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

Please send in your suggestions for the image below, by email to [editor@cq-tv.com](mailto:editor@cq-tv.com) or by post (see committee contacts for address)

**Trevor G8CJS**

“Took three people to lift it, two to drive it and the pictures were 4:3 I can't imagine why its not in use today”

**John Douglas - G4DVG**

“It's a camera, Jim , but not as we know it”

and the winner is.... John Douglas, congratulations - a caption generator will be on its way shortly.



## Contents

720P Sync and Test Generator – Part Two .....	33
Advertising Rates .....	4
A Shabby Cardboard Box .....	15
BATC Publications and Members Services .....	14
Caption Contest .....	2
Chairman’s Column .....	6
Circuit Notebook 98 .....	7
Committee Contacts .....	4
Contents .....	3
Contest News .....	30
Deadlines .....	4
Editors Preamble .....	5
It’s Museum Time Again! .....	10
Letters to the Editor .....	31
Lincolnshire Steam and Vintage Vehicle Rally 2008 .....	38
News from the Severnside TV Group .....	27
Small Outside Broadcast at short notice .....	28
Streaming Live Events .....	20
Synch Stretch Processor .....	12
The 2008 BATC Rally and Biennial General Meeting .....	27
Treasurers Report .....	18
Turning back the pages .....	36

### Copyright © by the BATC and contributors.

#### Legal Niceties (the small print)

E&OE. Whilst every care is taken in the production of this publication, the editor accepts no legal responsibility for the advice, data and opinions expressed. The BATC neither endorses nor is it responsible for the content of advertisements or the activities of those advertisers. No guarantee of accuracy is implied or given for the material herein. The BATC expressly disclaims all liability to any person in respect of anything and in respect of the consequences of anything done or omitted to be done wholly or partly in reliance upon the whole or any part of this magazine.

As the regulations for the operation of radio frequency equipment vary in different countries, readers are advised to check that building or operating any piece of equipment described in CQ-TV will not contravene the rules that apply in their own country. The contents of this publication are covered by international copyright and must not be reproduced without permission, although an exception is made for not-for-profit publications (only) wishing to reprint short extracts or single articles and then only if acknowledgment is given to CQ-TV.

Apart from any fair dealing for the purposes of published review, private study or research permitted under applicable copyright legislation, no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopy, recording or otherwise, without the prior permission of the publisher. All copyrights and trademarks mentioned in this publication are acknowledged and no infringement of the intellectual copyright of others is intended. Printed in Great Britain. ISSN 1466-6790

#### Notice to Contributors

Authors are alone responsible for the content of their articles, including factual and legal accuracy, and opinions expressed by them may not reflect the editorial stance of the publication. Material submitted to CQ-TV should not infringe the copyright of other writers or bodies. Articles remain the copyright of their authors and following publication in CQ-TV, they may also appear on the BATC’s web site and CD-ROMs, also in other not-for-profit amateur publications. Contributions are accepted for publication on this basis alone.

# Committee Contacts

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

**Chairman:** Trevor Brown, G8CJS  
Club affairs, Videotape library, and Technical queries, especially relating to handbook projects. 14 Stairfoot Close, Adel, Leeds, LS16 8JR. Tel: 01132 70115  
E-mail: chairperson@batc.org.uk

**General Secretary:** Graham Hankins, G8EMX  
General club correspondence and business. Library queries relating to the borrowing or donation of written material. Graham Hankins G8EMX, 84 Shirley Road, Acocks Green, Birmingham, B27 7NA. Tel: 0121 707 0420  
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

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

**Club Liaison:** Graham Shirville, G3VZV  
And 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

**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@cq-tv.com

**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).

**CQ-TV and BATC Webmasters:**  
Anything to do with the CQ-TV web site  
Email: webmaster@cq-tv.com  
or for the BATCs web site  
E-mail: webmaster@batc.org.uk

**Publications:** Paul Marshall  
Handbooks, Back copies CQ-TV, and anything related to the supply of BATC publications. Fern House, Church Road, Harby, Nottinghamshire NG23 7ED  
E-mail: publications@batc.org.uk

## Advertising Rates

Size	Mono	Colour
Quarter page	£45	£75
Half page	£90	£125
Full page	£150	£200

**Discounts available for multiple issues.**  
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@cq-tv.com

## 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

Well, summer is nearly over (did it ever begin?) and hopefully we will all have a bit more spare time to think about articles for CQ-TV now the holidays are over.

I know I've said it before, but finding content for CQ-TV is a real challenge, I have done my best to not simply fill it with reprints from other magazines, but it's not easy. So another plea, even if it's just a "letter to the editor", please keep sending me your words, photos, or even better, articles!

It's very easy to get in touch: you can email [editor@cq-tv.com](mailto:editor@cq-tv.com) or post a letter (address on page 4), I also have a personal website (it's not very interesting) where you can upload articles or send me a note:

<http://www.g1fef.co.uk>

Funny photo's for the caption contest are always very welcome, as are more serious/interesting ones for the covers. Make my day - send me something!

This issue is full of the clubs new streaming project at <http://www.batc.tv> I hope you find it interesting, even if TV over the internet isn't "your thing" I think we all agree that it is the future and the club wants to be part of that future, we must all change and adapt as times and technology marches on, or we risk being left behind.

I'm pleased to say that this new project has been a great success on several fronts:

Not only have we managed to secure enough outside funding from donations and sponsorship to make it work without draining club funds, but more and more viewers are using the service, more repeaters are "signing up" and now we have introduced free streaming accounts to all club members, there are quite a few personal streams coming online as well. Finally, the live events we broadcast went down extremely well, in both cases more people watched the live stream than physically attended event. I'm sure that says something about modern life!

Whilst I'm on the subject of outside funding, I would like to say a BIG THANK YOU to one individual who donated £2,000 towards the project. I can't name the person, as they asked to remain anonymous, but they know who they are and without their very generous donation the project would have been very difficult, if not impossible, to get off the ground.

On a different subject, we are trying to decide what to do about "members services", the equipment we hold in stock has hardly moved for several years now, our "sale" last issue brought in a few orders but the bulk of the kit remains. If anyone has any suggestions please get in touch, if no ideas surface soon, we may simply scrap a lot of the older items.

All items that appeared in past issues are still available for sale, however as items are sold out we will not be replacing them, unless there is a demand.

*73 de Chris (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'.

The archive is constantly being updated as more of the old paper issues are converted to electronic format. Currently issues 1 to 134 and 161 to 216 are included along with a few odd ones. This DVD 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 cost for this DVD is £5.00 for current members and £10.00 for non-members.

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

---

# Chairman's Column

I am sure that [www.batc.tv](http://www.batc.tv) our new website has not gone unnoticed, the site is still evolving and I hope will attract more repeaters, grow a bigger film archive library, and televise more live events.

At this moment in time it is working, we are live on the internet with pictures. We have televised two events, "The Microwave Weekend" and "The AMSAT – UK Colloquium". I hope by the time you read this that the "Members Streams" will be up and running (*indeed it is - ed*), sorry for the delay in this section but we need to guard against misuse so we have set a policy that anyone can view but only members can stream to the site. To this end we need to create a login system and an electronic database to verify everyone is who they say they are.

I would like to take this opportunity to thank everyone who has worked on the project from the crewing at the live events to editing up and transferring material to the library and most of all to Chris for writing the code to make it all work.

On the business front we have created sponsorship links on the site to finance the project, perhaps a break with tradition, but we are a small club and this is an expensive project. Subscriptions to the club cover the cost of printing CQ-TV and some of the small administration costs mostly for the existing website. So we have opened up the site to sponsorship to raise the necessary funds and so far this has been a success. Most

of the sponsors have come to us although I do admit to doing a little chasing. I think it is a mark of how well we are connected with the commercial world and that the sponsors have wanted to help the club. At the present time they have wholly financed this project in the purchase of equipment, both hardware and software and covered the site rental and power charges for Docklands where the equipment is located. The only outstanding charge is for bandwidth. We will be charged for each byte of data coming into the streamer and each byte going out to each viewer. We know how much a byte costs, but not how many bytes we have used until the bill arrives and this charge is the worrying one, because the more viewers we attract the more charges we accrue.

Elsewhere in the magazine I have written an article that explains various hardware options for streaming a live event and I hope it will encourage others. It starts with the early technology of genlock.

When you have read it I hope it will give understanding of this system on which the early ITV network relied on for synchronising stations and outside broadcasts.

This was fraught technology but it worked, but then sometimes it did not and the results could be catastrophic. Sync disturbances could ruin VTR recordings and play backs, and telecine machines have been known to shred film.

When I first started in ITV we used to feed outside broadcast events to World of Sport and LWT amongst them was horse racing. LWT would genlock to our outside broadcast unit, which in turn would genlock to the remote camera truck somewhere down at the end of the race course. The crew of this remote unit were always keen to get de rigged and off to the pub as soon as the race was over. On a number of occasions they would power down when the last horse passed them. The resulting sync disturbance would reverberate to the OB scanner and all the way down to World of Sport at LWT and out to all the other ITV companies who were genlocked to LWT. It's a fraught technology but then ask the batc live events crew, they had their moments with it.

I cannot close this column without mentioning the Christmas tape article I wrote in the last issue I have had a lot of correspondence with members who had copies of tapes and in some cases did not know what they were. At this point in time nobody knows where the HS 100 engraved disc is, but I am sure it will surface one day.

This is also the last issue before the BGM which again is being held at Stow-Cum-Quay there is a lot of behind the scenes work going on to organise lectures and communications, I hope you have all put the 5th of October in your diary and that everything runs smoothly on the day

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](mailto: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

# Circuit Notebook 98

By John Lawrence GW3JGA

Circuit Notebook looks at three methods of measuring frequency in the 10GHz band

10GHz Amateur TV is often radiated by using a self-excited transmitter such as a modified satellite LNB, or 'Solfan' Head, as shown in Fig.1. A method of frequency measurement is needed so that you can set and confirm where you are in the band and so maximize your ability to establish a QSO.

## Absorption Wavemeter

In my early days of experimenting on 10GHz with a reflex klystron, everything was built in X-band brass or copper waveguide. This included the wavemeter for checking frequency. My wavemeter is shown with its calibration chart in Fig.2. It is similar to that described in the RSGB Microwave Handbook [1].

The wavemeter consists of a tunable resonant cavity and a detector diode and meter. Signals enter at the right hand end of the waveguide and pass to the diode detector at the left hand end. Another section of waveguide is fixed at right angles to the first and signals are coupled into it through a small aperture where the waveguides cross. The far end of this second waveguide is closed off and the near end is fitted with a movable tuning plunger or 'shorting block' which can be moved by the micrometer adjuster so as to vary the resonant frequency of the enclosed cavity.

In use, the incoming signal is rectified by the diode and indicated on the meter. The micrometer is then adjusted until a 'dip' is obtained in the meter reading caused by energy being 'sucked out' by the resonant cavity. The micrometer reading is noted and the frequency is read from a calibration chart. The tuning rate of the micrometer is about 170MHz/mm and the barrel is graduated in 0.01

mm divisions giving 1.7MHz/division. With care, a frequency at 10GHz can be measured to better than +/- 10MHz, corresponding to an accuracy of +/- 0.1%. Although the wavemeter is bulky, it is simple to operate and gives an indication of signal strength as well as an unambiguous measurement of frequency. However it does need initial calibration using a known frequency signal. The best detection of a horizontally polarized signal is provided when the broad face of the waveguide is vertical.

## Digital Frequency Counter and Down-converter

This uses a hand-held digital frequency counter (Watson FC-130) connected to a modified satellite TV LNB (Low Noise Block) used as a frequency down-converter, as shown in Fig.3.

The LNB contains a frequency converter stage with a local oscillator of (nominally) 9.0GHz. (similar to those supplied by Bob Platts G8OZP) [2].



Figure 1  
GW3JGA/P 10GHz, Penmaenmawr Promenade

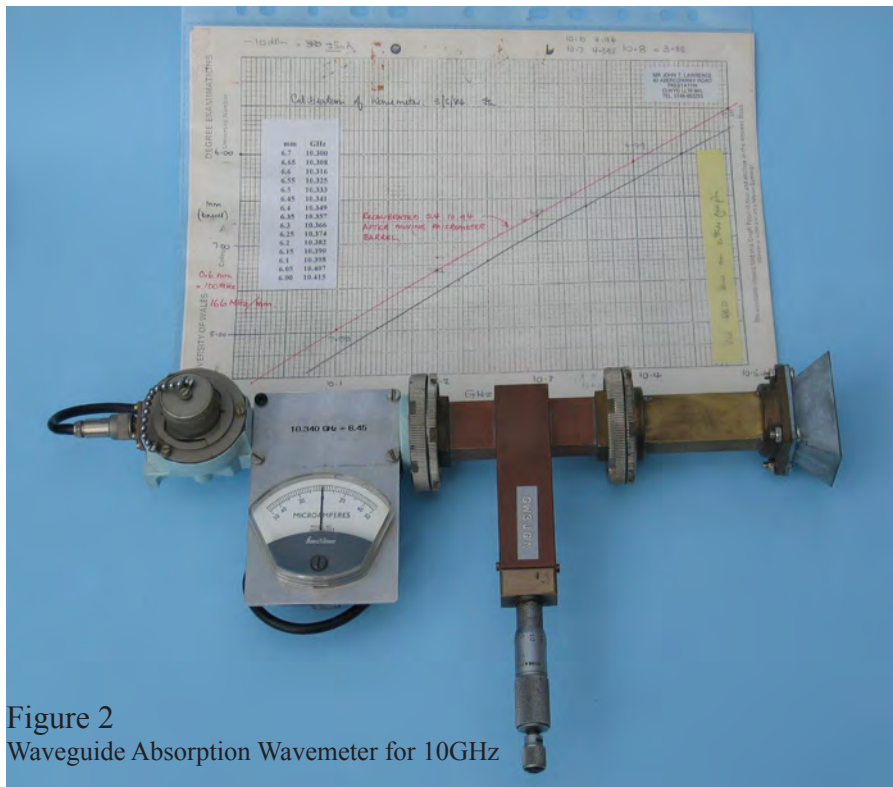


Figure 2  
Waveguide Absorption Wavemeter for 10GHz

An incoming signal to the LNB of say 10.340GHz would produce an IF output of  $10.340\text{GHz} - 9.0\text{GHz} = 1.340\text{GHz}$ . This can be measured and displayed by the digital frequency counter. The Watson FC130 is an excellent choice for this purpose as in addition to displaying frequency it also indicates signal strength. The LNB must be supplied with 12-15 volts and this is done using an RF choke to feed the voltage to the LNB coax with a capacitor to block off the DC from entering the frequency counter [3].

The overall accuracy of the system is mainly dependent on the accuracy of the LNB 9GHz local oscillator. The actual frequency can be determined by receiving a known signal and subtracting the indicated frequency. For example, a known frequency of say 10.340GHz might be displayed as 1.334GHz. The local oscillator frequency is given by  $10.340\text{GHz} - 1.334\text{GHz} = 9.006\text{GHz}$ . (This actually applies to my LNB and I have marked it on the plastic cap for future reference, as shown in Fig.3).

This arrangement is very sensitive and can detect and display the frequency of an oscillator circuit several metres away. I use this to monitor the frequency of the DRO (dielectric resonator oscillator) when modifying LNBs for use on 10GHz ATV.

**Digital Frequency Counter with Pre-scaler**

This arrangement is frequently used to allow a basic low cost frequency counter to measure frequencies in the 70cms and 23cms bands. The incoming signal is passed through a pre-scaler or frequency divider (usually /10 or /100) so that the displayed reading can be interpreted directly.

Pre-scalers for 10GHz have, until recently, been difficult to build and/or expensive to buy. The 12.5GHz pre-scaler XP12-10 by GH Engineering solves this problem for us. It operates up to and beyond 10GHz and conveniently divides by 10 to give a 1GHz output. This is suitable for a UHF digital frequency counter, such as the Watson FC-130 mentioned previously. The GH Engineering pre-scaler is available as a PCB or fitted in a tin box with SMA or other type connectors as shown in Fig.4.

GW8FEY has built a complete 10GHz 'sniffer' frequency counter using the XP12-10 pre-scaler fitted inside a die-cast box with an FC-130 counter fixed to the outside, as shown in Fig. 5. The 10GHz 'sniffer' dipole aerial, resting on the case, is as described by Jim Toon G0FNH in CQ-TV 154 [4]. An internal view, showing the GH Engineering XP 12-10, is given in Fig. 6. The accuracy of frequency measurement depends on the performance of the FC-130 which, although not specified, is probably within a couple of parts-per-million. A CAL adjustment is provided on the counter for a more accurate setting.

My thanks to Barry, GW8FEY, for the loan of his frequency counter.



Figure 3  
Digital Frequency Counter and LNB Down-converter





Figure 5  
GW8FEY 10GHz Frequency Counter

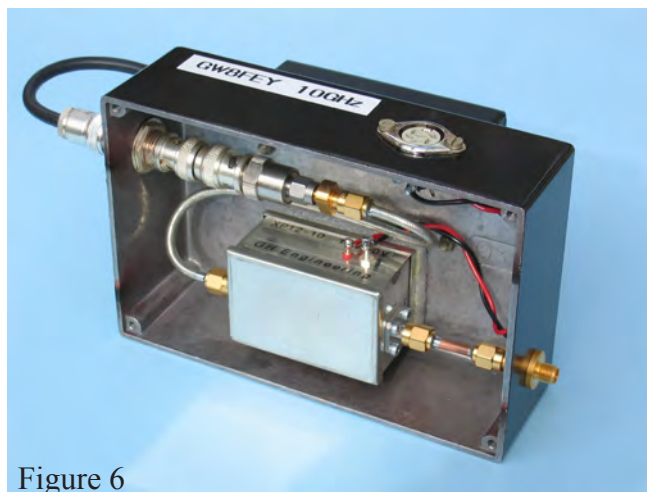


Figure 6  
GW8FEY Frequency Counter, inside view

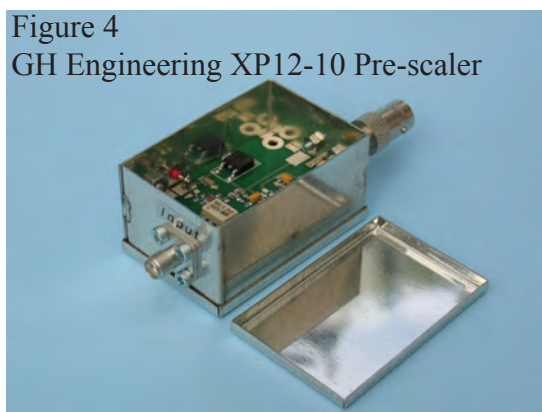


Figure 4  
GH Engineering XP12-10 Pre-scaler

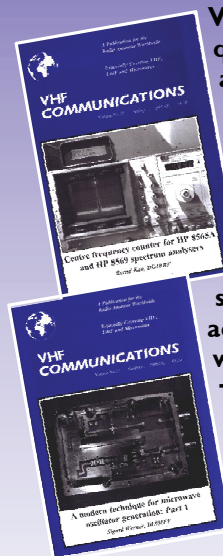
#### References

- [1] RSGB Microwave Handbook Vol.2. p10.21
- [2] 3cms LNB 9.0GHz Local Osc. Bob Platts, CQ-TV191 p.12
- [3] Circuit Notebook No.75, CQ-TV 196, p.17
- [4] 10GHz ATV the easy way, Jim Toon G0FNH, CQ-TV 154, p.36.

GH Engineering [www.ghengineering.co.uk](http://www.ghengineering.co.uk)  
Watson FC-130 (Waters & Stanton) [www.wsplc.com](http://www.wsplc.com)

# VHF COMMUNICATIONS MAGAZINE

*A publication for the radio amateur worldwide, especially covering VHF, UHF and Microwaves*



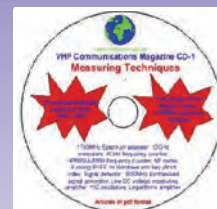
VHF Communications is a quarterly magazine only available by subscription. The subscription for 2008 is £21.00 which includes UK and surface mail postage. Air mail postage is available at an extra cost.

For more information or to subscribe contact us at the address below or visit [www.vhfcomm.co.uk](http://www.vhfcomm.co.uk)

The web site has sample articles and a full index from 1969 to the present that can be searched to find articles. All back issues are available, most are just £1 plus postage.

Two compilation CDs are available for £10 each plus postage.

CD-1 on measuring techniques contains 21 articles published in VHF Communications magazine from 1988 - 2005.



CD-2 on Transmitters, Receivers, Amplifiers and Ancillaries contains 32 articles published in VHF Communications magazine from 2000 - 2005.



K M Publications, 63 Ringwood Road, Luton, Beds, LU2 7BG, UK. Tel/Fax: +44 (0) 1582 581051, email: [andy@vhfcomm.co.uk](mailto:andy@vhfcomm.co.uk)

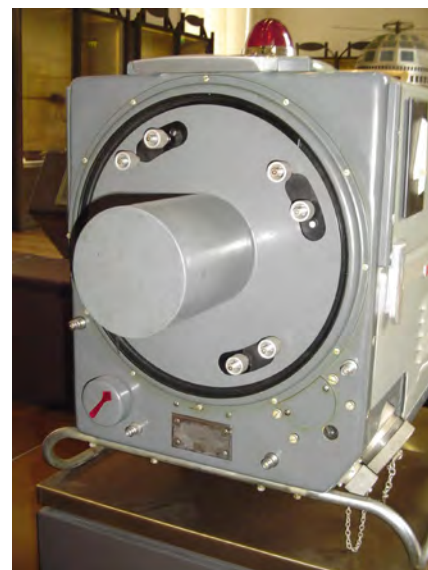
# It's Museum Time Again!

*Dicky Howett trips around Paris*

On a weekend visit to Paris, (and having been given a Gallic bum steer), I eventually found a delightful tv/radio related museum. Not situated, as the Paris web site indicated (it's still listing some entrance fees in Francs) at the doughnut-shaped Radio France across from the Eiffel Tower, but instead, away down at the jolly Rue Reaumur. Here we find the Musee des Arts et Metiers housed in a sort of restored church.

course no lenses evident. Still, the over-engineered and king-sized focus handle made up for any deficiencies.

Pleased also to spot a steel-tape recorder from 1930 called a Blattnerphone, sporting it's usual five (this included spares) vertically mounted record/erase heads. Again this item looked strangely incomplete, sitting as it did on a stout wooden kitchen table and not the usual metal control box arrangement. Further along, was a Rene Barthelemy 'camera'



**Top:** Type THT 620 with the awkward turret.

**Left:** The 1930 BLATTNERPHONE. Behind can be seen a blimped Debrise 'Parvo' 35mm movie camera.

**Bottom:** Rene Barthelemy 'camera'. Disc spinning/light emitting arrangement perhaps?



This museum has over 3,000 inventions on display including Scientific Instruments, Transportation, Energy, Mechanics plus a little bit of film, tv & radio. It was here I spotted a rare bird indeed, a P.E.S Photicon (Iconoscope type) tv camera from the 1950s. A French re-engineered version that is, although the 'Pye of Cambridge' antecedents are plain for all to see. Dated 1960, this SCF-TH (Thomson Houston) 620 re-jig is patently incomplete, judging by the very odd looking turret ensemble which would never accommodate a bundle of stout 'Ortal' lenses. A travel cover perhaps? No explanation and of

with the splendid portmanteau moniker of 'Telephonovision, This quite bulky camera was used in the early 1930s at the Studio de Grenelle in Paris. Of mechanical scan design, this camera appears to be disc-based, but whether, the 'spotlight' scanning came from within the camera or available light was used, it was difficult to determine. The information given about this camera was sketchy, but as with most museums I've visited recently, critical information can be woefully inaccurate (our own Science Museum falls short here) with incomplete, misdated and generally misattributed artefacts displayed as the





'real thing'. This circumstance is at best, unhelpful, at worst, a deception. Perhaps I'm just getting difficult to please?

Dicky Howett 2008

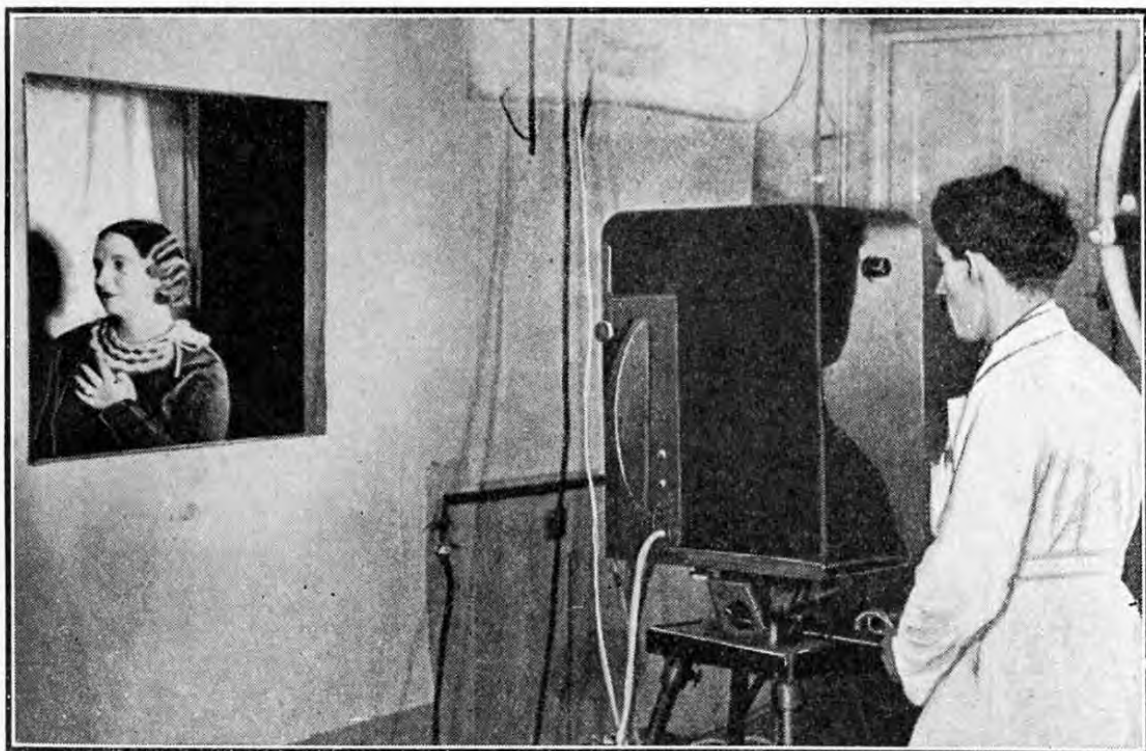
Musee des Arts et Metiers. 60 rue Reaumur. Paris  
[www.arts-et-metiers.net](http://www.arts-et-metiers.net)



**Left:** type THT 620 camera.

**Right:** A 1955 French tv receiver. The THT 620 camera reposing in the background.

**Bottom:** The Rene Barthelemy camera in situ. 1930s photograph.



TELEVISIONING A "CLOSE-UP" IN THE STUDIO OF A FRENCH TELEVISION STATION. THE SCANNING AT THE TRANSMITTER OPERATES ON A MECHANICAL PRINCIPLE AND A PART OF THE COVER OF THE SCANNING DISC CAN BE SEEN PROTRUDING FROM THE SIDE OF THE CASE

# Sync Stretch Processor

by Richard L. Carden VK4XRL

Why a sync stretch processor you may ask. It's been a while since we have seen one presented here in CQ-TV the last one being THE "BIG SYNC" MODULATOR by Trevor Brown G8CJS.

The sync stretch processor is required because of the non linearity's associated with both valve and transistor power amplifiers. Also while some may be contemplating going digital, FM and AM will be around for some time due to the costs associated with digital. Therefore for those still using AM this unit could be a bonus providing correct sync levels while driving your power amplifiers a little harder.

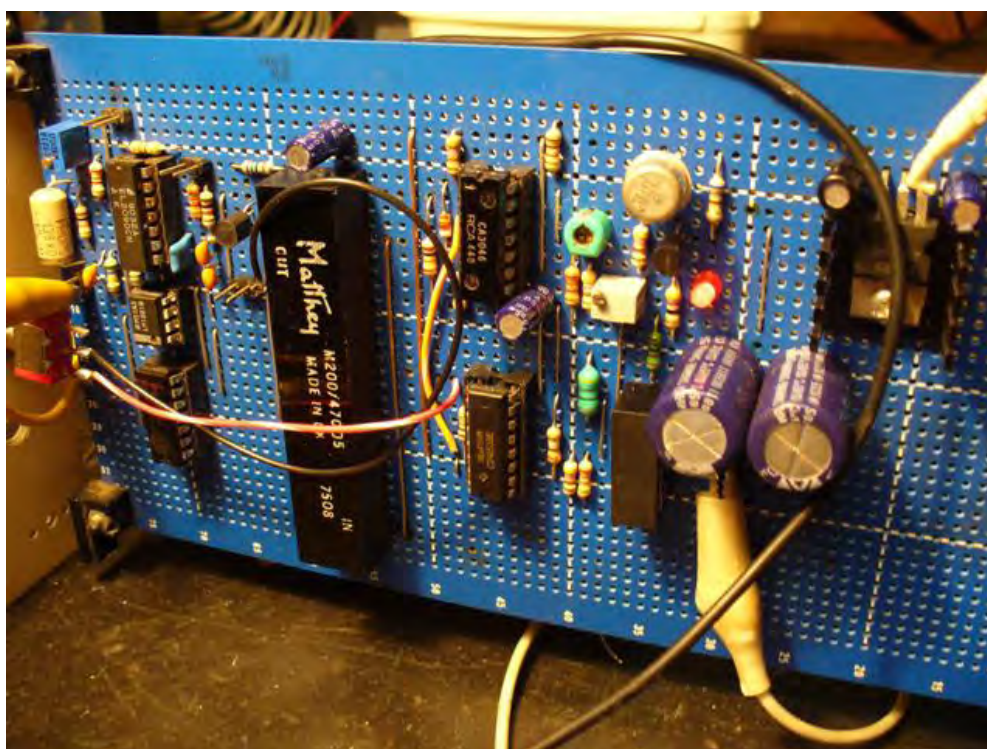
The circuit is not new and in fact way back Mike Cox in CQ-TV 49 had a video processor amplifier. Also in the old yellow book 'Amateur Television' John Lawrence describing a vidicon camera had a very similar video processor. The only thing with these units were that these had been designed for B&W and used blanking pulses to set black level as well as sync pulses added to the output waveform.

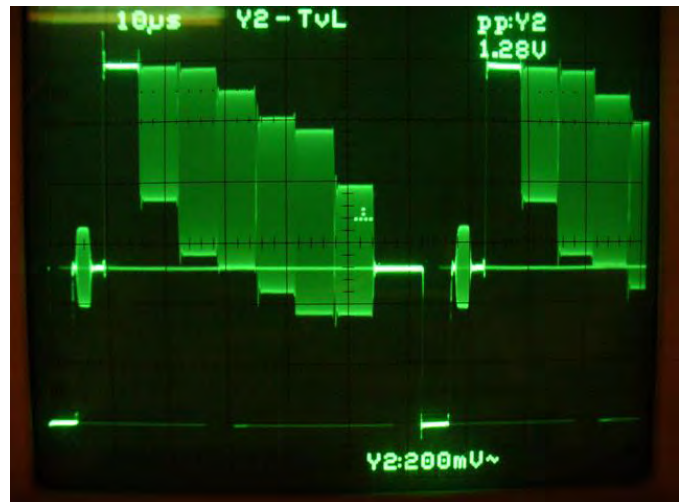
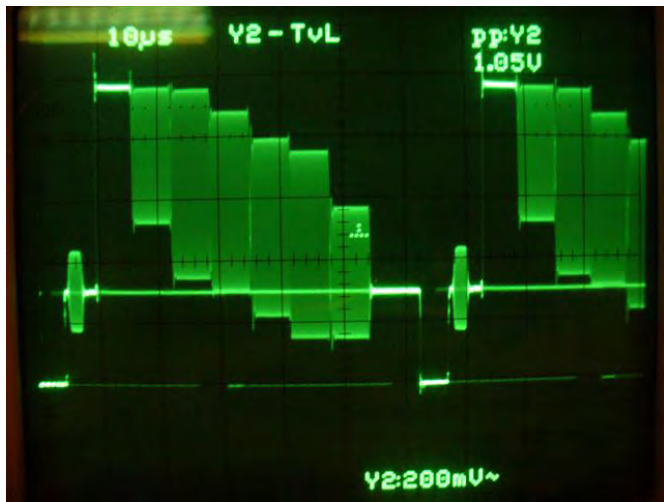
Now we don't need blanking as with colour we don't want to disturb the colour burst on the back porch. We still need a clamp to clamp the video input before we can add syncs and this is performed in the EL2090 plus we also use the LM1881 or its equivalents to derive the clamp pulses and providing separated sync pulses which we will later use.

The EL2090 provides clamped video at its output (pin 13) and also provides some video gain (level) control. Clamp pulses from pin5 of the LM1881 feed pin7, the clamp sample and hold circuit within the EL2090. The output from the EL2090 feeds a 200ns delay line, this makes up for the slight delay in forming the separated sync pulses via the LM1881. Sync pulses from pin 1 (LM1881) are inverted in the 4011 and fed to the video and sync adder circuit. The level of the sync pulses are then controlled by the DC voltage feed to pin 4 of the CS3046 multi-transistor integrated circuit. Discreet components could also be used if the IC is not available.

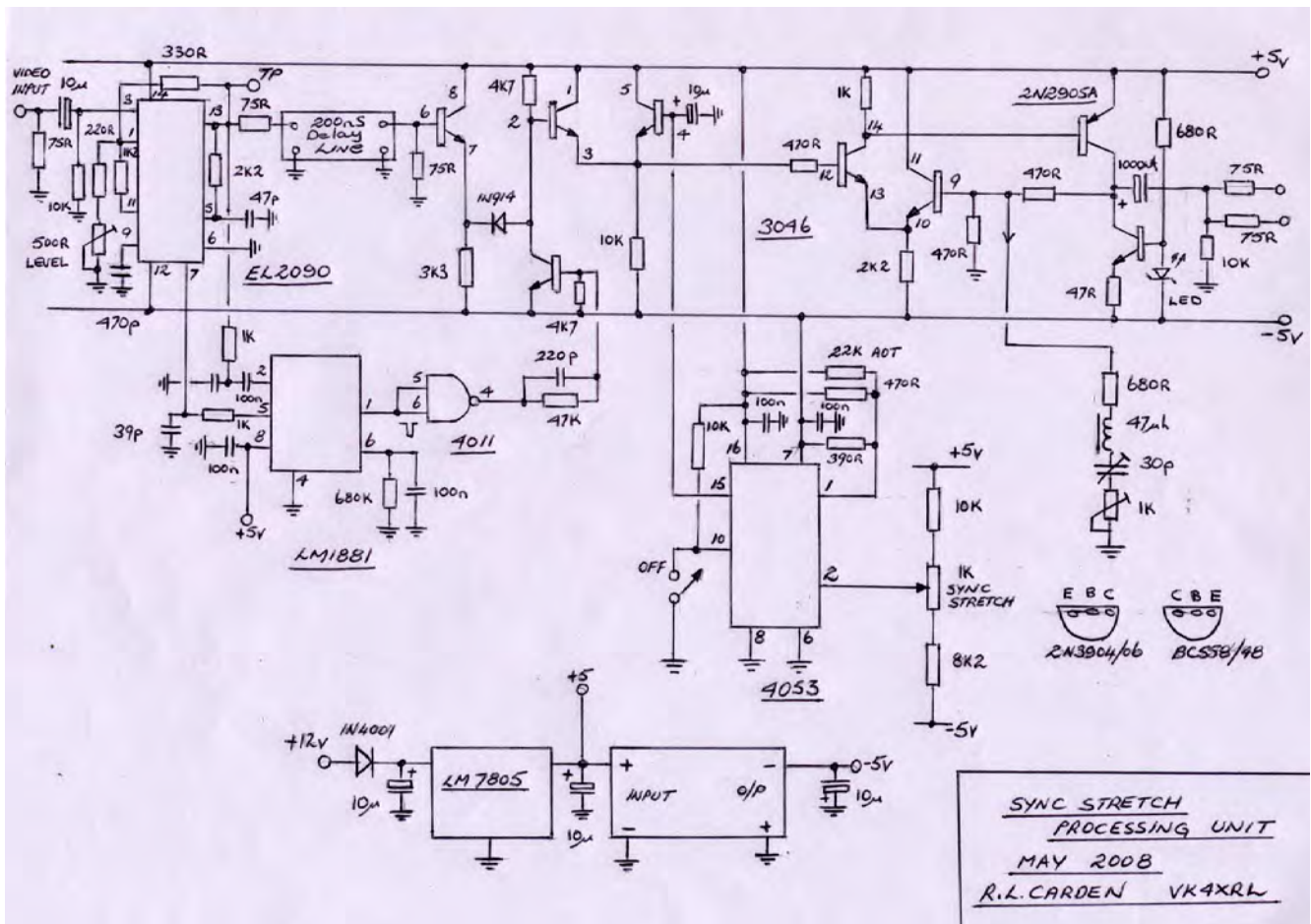
The sync level is fed via a 4053 switch, this allows for correct sync level in the non sync stretch mode for testing and is set via the potential divider formed by the 390 ohm and 470 ohm resistors, and the 22k AOT sets the correct level.

Pin 2 of the 4053 has a variable DC voltage formed from another voltage divider to allow for increased sync level for compensating for the non linearity's within the AM transmitter power amplifiers. A small amount of video boost at the chroma frequency is applied to the video output via the series resonant circuit. The trimmer sets the frequency while the trimmer resistor sets the required correction needed. Setting up is straight forward. The video level control is set for 0.7v, while in the non sync stretch mode the 22k AOT resistor sets the sync level to 0.3v. In the sync stretch mode the variable sync level is adjusted so that the received sync level as seen on a reference receive is at the correct level. Note that the unit has been built on matrix board, and a small capacitor (10P) has been added across the base and emitter of the output transistor to stop some tendency of the output stage from taking off.





Before and After waveforms



Cyber-membership: CQ-TV beamed directly to your PC  
 four times a year for only £4  
 Visit: [www.batc.org.uk](http://www.batc.org.uk) for details

# BATC Publications and Members Services

Publications	Each	Qty	Total
<b>An Introduction To Amateur Television (225gm)</b> The latest handbook full of detailed information on how to set up your ATV station, plus lots of new video and RF construction projects. The BATC handbook featuring construction articles on video units, 24cm and 3cm ATV, a Digital Frame Store, and much more.	£2.50	.....	.....
<b>The Best of CQ-TV (150gm)</b> A compilation of the best construction articles from CQ-TV's 133 to 146	£3.50	.....	.....
<b>CQ-TV Back Issues:</b> The following issues are still available. Please circle those required: 185, 186, 187, 188,189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210,211,212,213,214,215,216,217,218	£1.50	.....	.....
<b>Special Offer: Any four of the above issues</b> 219,220,221,222	£5.00	.....	.....
<b>The BATC DVD</b>	£3.75	.....	.....
	£5.00	.....	.....

**All publications can be ordered, with a credit card, via our online shop - [www.batc.org.uk](http://www.batc.org.uk)  
Or by sending a cheque made out to 'BATC'**

*All items appearing in Members Services from previous editions, can still be ordered (subject to availability). Please see page four for contact details. Several items are still on sale, so please check for the latest pricing before sending a cheque.*



[www.nonanet.co.uk](http://www.nonanet.co.uk)  
[sales@nonanet.co.uk](mailto:sales@nonanet.co.uk)

**Nonanet (UK) Limited are a UK Internet Services Provider**

We specialise in providing bespoke hosting solutions, some of our services include:

- Web design & hosting
- Programming
- Consultancy
- Email services
- DNS hosting
- SEO work
- VoIP Services
- Send/Receive text messages from your desktop
- SMS short-codes (premium or standard rate)
- SMS API via SMPP/HTTP/SOAP/Email
- Bespoke SMS services
- Low cost bulk SMS
- Low cost premium route SMS

Contact us on: 0845 8622322 or email: [sales@nonanet.co.uk](mailto:sales@nonanet.co.uk)

**We will provide free hosting services to any project involving ATV  
whether for the individual, club or repeater group  
Contact us for details**

# A Shabby Cardboard Box

by Donald MacLean G3DNQ

I suspect I may not be alone in having, in an obscure corner of my den, a rather disreputable cardboard box containing some ancient artefacts, never likely to be of any real use ... but which for decades I have protected from my xyl's favoured mantra "Use it - or chuck it".

The BATC have asked me to tell you about this one because it and its contents are en-route to a more useful home - the Science Museum.

My memoirs will be published this year (if I meet my publisher's latest in a sequence of ignored deadlines!) and they show me that my eighty-something years can be regarded in four phases – school & college, BBC, Business, Retirement.

The length of this last phase (mercifully, for it's a very pleasurable one) is approaching the length of the second one which consisted of 3 decades in which I repeatedly found exciting/scary opportunities to give the creative frontiers of broadcasting a little nudge.

The larger postage stamp on this box celebrates the silver jubilee of King George V which dates it at 1935 and the label shows that it was delivered to a Mr Cooper in Bishop's Stortford – of whom, forty years later, I was a neighbour and fellow radio amateur.

I had by then graduated from being a TV Producer (of "Dixon of Dock Green" and "Come Dancing" etc) to



heading the BBC's Popular Music department during the Beatles/Stones era then, after 30 years in the BBC, had left and was now creating 'new-media' businesses worldwide for a company that dominated the entertainment field.

I was involved in my company's deciding which of the competing videotape technologies we should adopt (we had extensive interests in both software and hardware markets). I recall being flown in private jets to demonstrations in Europe and the US of Sony's Betamax, JVC's VHS, Philips' Video 2000 and RCA's CED system. Our adoption of VHS was a central factor in ending that format 'war'.

I was elected chairman of several industry bodies, including the "Information Industries Council" of the Cabinet Office, and as a result found myself from time to time on the 'wrong' side of TV cameras. Instead of being labelled "the BBC's youngest producer" I was now cast as the evangelist of the future 'videodisc' (CD/DVD). Which is why I was visited one day by this elderly gentleman who lived nearby. "I saw you on the news saying that the 'video-disc' will soon arrive and will have a significant market life (followed by an era of solid-state memory) ... and I wonder if you might like to have this?" and he handed me this shabby cardboard box. In it was a single 78rpm vinyl record in the familiar brown paper sleeve, and some documents. "I thought you might like to know that there was a video-disc 40 years ago ... this is it. And in fact there was a form of visual

recording even earlier – in 1928." The documents were receipts for the disc's 7 shillings cost, plus 6d postage, and rough photostats of pages from a magazine "Television and Short Wave World" dated June 1935 showing (a) An advertisement for the record and (b) an article headed "'Television' from Disc Records". You will note that the word Television is in quotes – implying doubt as to the aptitude of the word (apart from anything else what is recorded on the disc is a series of still pictures).

The advertisement includes this: "... Different modulation strengths are recorded on opposite sides to enable various types of pickups to be



employed. Reverse pickup leads to obtain a negative or a positive picture. Only one stage of amplification is required. Recorded at the same speed and number of lines as the present BBC transmissions (30 lines). A boon to the experimenter and demonstrator." [For detailed information about it you should visit the website of my erudite namesake Don McLean: <http://www.tvdawn.com/index.htm>]

I can't resist quoting to you the opening sentence of the article: "The idea of recording television pictures has always been intriguing, though it may not be apparent that the scheme has any commercial use."



I did remember one day in 1930 being invited by our neighbours in York to see their Baird "Televisor" though I don't recall whether we received the signal from Brookmans Park and saw any of the output of Baird's studio in Long Acre.

The Science Museum will also receive my copy of the original (handsomely produced) Price List of Baird Televisor components, including the (20" diameter) "Receiving Disc" for £2 2s. 6d. and, at 7 guineas, the Universal Motor with Synchronising Gear. The mains lead, at 5/6d, is cloth-covered and terminates in a bayonet plug.

During 1928 the press had generated considerable public curiosity about the idea of TV – encouraged, naturally, by the Baird Television Development Company which sought permission from the Postmaster General to make demonstration broadcasts. This was

refused, but instead it was arranged that Baird would demonstrate his system to the BBC and he did so on Tuesday 9th October 1928.



Wireless World on October 24th 1928 reported the BBC's response that the system was interesting but still too experimental to justify transmissions. WW Editor Hugh Pocock used his Editorial page to propose a compromise – a limited number of out-of-hours demonstration relays, using a standby transmitter, and receivers in several public places, to allow the public to make up its own mind.

On another page of that issue is a snippet of news headed "Ether Pictures" which reads "Picture broadcasting is to begin on Tuesday next, October 30th 1928. On and after that date, owners of picture receivers will receive their daily thrill from 2 to 2.15 p.m. ... transmitted from Daventry 5XX." The system had been developed by a Mr Otho Fulton. THE 1928 "FULTOGRAPH". In the transmitter a monochrome transparency is fixed to a revolving drum and is read by a beam of light and a photoelectric cell. The light beam is interrupted by a spinning serrated disc so that the output is an audio frequency of about 1khz (its volume varying in proportion to the strength of emerging light) - which can be sent and received by any standard wireless system. A Fultograph receiver simply replaces the viewer's loudspeaker.

A synchronising signal is introduced at the start of each revolution of the cylinders, the circumference of the receiving one being slightly smaller than in the transmitter's – its rotation is briefly stopped, once per revolution, by





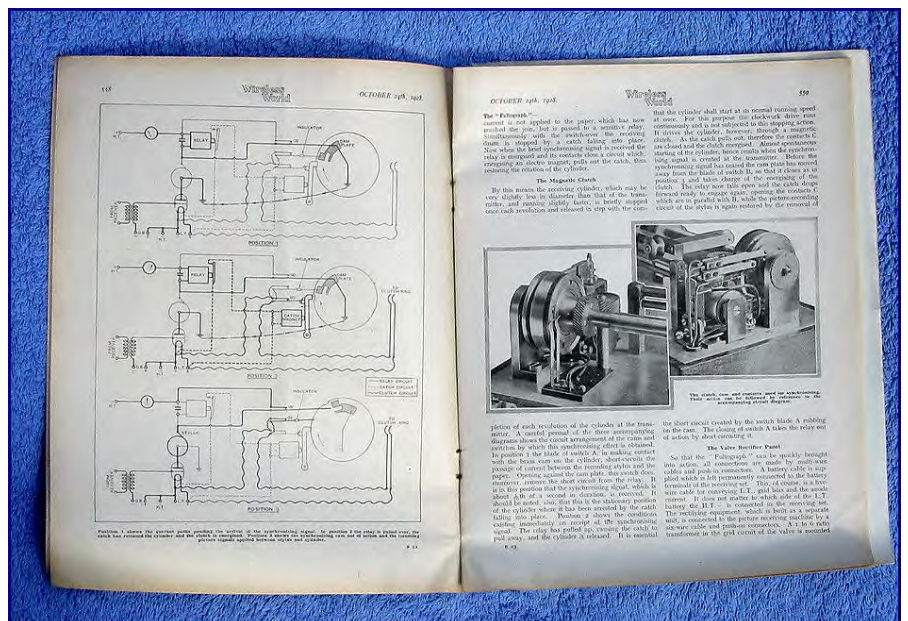
international company with whom I spent my third phase had created the television system that in 1935 replaced Baird's, and indeed the cameras that, in phase 2, I had directed in Lime Grove. Moreover the 'media' curator at the Science Museum who now welcomed my offer of these artefacts has the surname Baird. I think John Logie Maclean would approve his grandson's vocation?

<http://www.macleans.com.au/author/john-logie-macleans/>

a latch which is released by the arrival of the next sync signal. The drums at each end of the system are traversed in unison across the image by screw threads. At 50rpm it takes 4¼ minutes to communicate an image of 3⅞" x 5½".

The received image is drawn by tracing with a small voltage on paper treated with potassium iodide in a starch solution, producing a deep blue trace. I hope that these and similar documents, and the 1935 "television record", will be of interest to future generations visiting the fascinating National Media part of the Science Museum.

Fate can sometimes produce surprising symmetries: readers of CQ-TV will probably have twigged that the



# Treasurers Report

## Income and expenditure account

At 31 December	2005	2006	2007
<b>Income</b>			
Subscriptions	13,720.15	11,988.54	10,388.26
Members services	3.15	26.16	-1,463.74
Publications surplus	266.87	102.60	74.65
Advertising	193.00	150.00	0.00
Bank & Building society interest	917.41	1,069.13	1,147.11
Rally or Covention surplus/loss	0.00	-190.35	0.00
Donations recieved	11.13	99.50	1.40
Postages, Airmail	36.00	108.00	72.00
Miscellaneous	5.00	10.23	5.00
	£15,152.71	£13,363.81	£10,224.68
<b>Expenditure</b>			
CQ-TV printing	8,034.42	6,485.00	4432.54
CQ-TV postage	4,240.91	2,517.33	1866.83
CQ-TV production	253.21	99.83	0.00
General Office expenditure	12.99	1.69	46.73
General Postage	217.63	52.50	42.04
Internet Web Site expenses	305.47	294.60	261.51
E- Mail, ISP expenses	179.88	164.89	89.96
RSGB affiliation fee	42.50	44.00	44.00
Committee meeting attendance exps.	0.00	0.00	0.00
Insurance & legal	147.00	0.00	0.00
Rally attendance	78.00	68.00	0.00
Recruitment	21.00	152.03	148.04
Adverts and publicity & Projects	41.00	0.00	0.00
Donations made	341.12	0.00	0.00
Bank charges, mainly "VISA" costs	265.64	296.75	354.24
	£14,180.77	£10,176.62	£7,285.89
<b>Surplus for the year</b>	£971.94	£3,187.19	£2,938.79

## Notes for 2006/7

The figures in "Income" for members services, publications, the rallies and conventions are the net contributions or loss to club funds.

I have taken this opportunity to re-value the members services stock and the value of back issues of CQ-TV, much of which was old or obsolete. Hence the negative figure for members services.

Balance sheet at 31 December	2005	2006	2007
<b>Fixed assets</b>			
Office equipment Additions	91.82	0.00	0.00
Less Depreciation	-91.82	0.00	0.00
<b>Current assets</b>			
Stock: - Members services	1907.13	1,788.35	322.23
Publications	55.00	0.00	0.00
Back issues of CQTV	300.00	250.00	100.00
Nationwide Building Society	138.48	140.82	144.19
HBOS (Halifax bank) deposit a/c	10,765.66	10,967.57	11,171.95
GiroBank Alliance & Leicester account	281.95	608.95	287.85
HBOS** current account	17,652.52	18,489.30	20,404.95
HBOS** investment a/c	30,540.58	31,174.48	31,839.34
<b>Less Current liabilities</b>			
Subscriptions received in advance	14,634.69	13,225.65	11,137.90
	£47,006.63	£50,193.82	£53,132.61
<b>Represented by accumulated fund</b>			
Balance brought forward	46,034.69	47,006.63	50,193.82
Surplus	971.94	3,187.19	2,938.79
Balance carried forward	£47,006.63	£50,193.82	£53,132.61

\*\* HBOS previously the Bank of Scotland

I have examined the books and records of the British Amateur Television Club and confirm that the balance sheet and the income and expenditure account are in accordance with those books and records.

Mrs. T. Rees  
Ducklington Oxon  
Date 9 August 2008

Brian Summers  
BATC Honorary treasurer  
Date 9 August 2008

Bookmark the new online ATV forum now:  
[http://www.batc.org.uk/club\\_stuff/forum.htm](http://www.batc.org.uk/club_stuff/forum.htm)

# Streaming Live Events

Trevor Brown- G8CJS

I am sure by now you have all found the new club video streaming site...

<http://www.batc.tv>

...where you can view live video on your PC. There are ATV repeaters, and ATV film archive, members streaming and live events. So far there have been two live events, the Microwave Weekend and the AMSAT-UK colloquium.

I hope there will be further events, but in order for these to take place more of us need to get involved in making it happen. To this end I thought I would go through some of the hardware problems and some of the solutions to televising an event using a multi camera shoot and interfacing it to the club streamer.

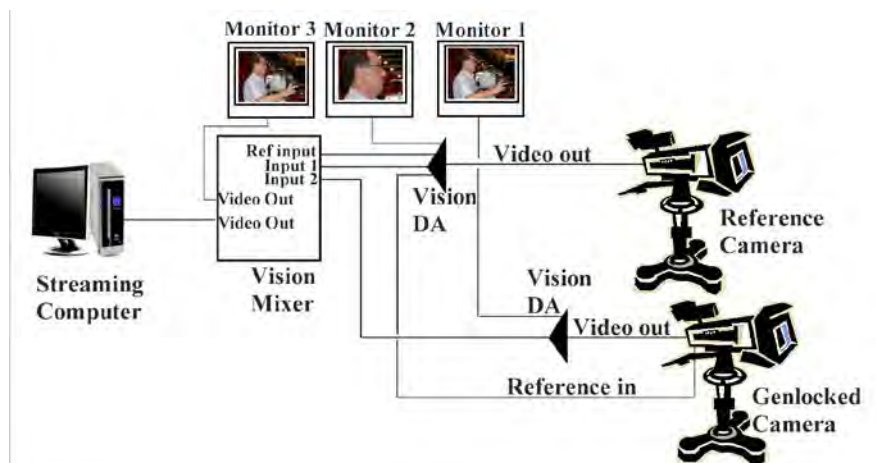
See front cover image of the BATC Crew at the AMSAT Colloquium held at Surrey University

I suppose it goes without saying to televise an event you will need a camera, preferably two and the option of switching between them to make the production look interesting. Camera's come in all sorts of shapes and sizes from the humble CCTV camera, through to the professional and semi professional cameras, and don't let us forget the family camcorder. We need to be able to switch and mix between these video sources and to do that they need to be synchronous sources. Try to think of a TV picture as a single spot scanning the TV lines, two unconnected cameras may not be scanning the same part of the picture at the same time and so if one

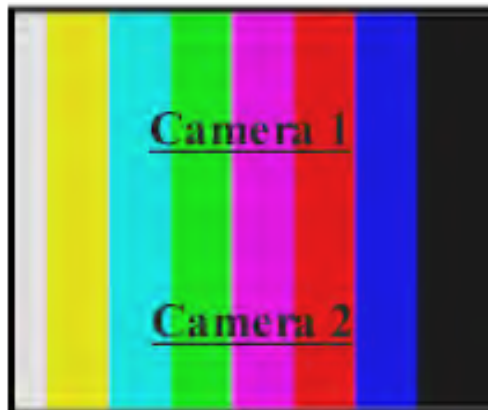
camera is generating part of line 225 and the other is generating part of line 125 then there will be a picture jump when you switch between them. A TV set would soon jump between the pictures and this cut may be hardly noticeable. Not all equipment is as tolerable as a TV set. A video recorder with its head drum locked by a servo to the incoming signal would certainly be in trouble and the streamer encoder would also find this is unacceptable. This non synchronisation of sources will also not allow mixes and superimpositions, between cameras and would limit TV production. There are various fixes for this problem lets look at a traditional solution first.

## Genlock

A camera with a genlock input, can look at an external video source or reference and adjust its own scanning to be in sympathy. So one of the video sources can be used as a reference to all the other genlockable sources and this reference source need not have genlock facility. The camera's can then be used with a conventional vision mixer to mix and superimposed without disturbing the video to the streaming computer or video recorder. Genlock will lock the TV raster's, rather like two cars on the same road driving at the same speed, but if you want them side by side then they will need phasing up.



**Camera 1 and 2  
Need Line Phasing**



**Camera 1 and 2  
Correctly line phased**

Unless you are very unlucky or have long cable runs both camera's will have the same line phase, if you are unlucky this can be viewed on a vision mixer with a horizontal wipe and corrected with the line phasing control on the genlocked camera

Slightly more complex is colour phasing, both cameras will be producing a PAL colour signal, composed of a complex modulation of a 4.43 MHz subcarrier signal, this subcarrier is again locked in speed with genlock but the sources will almost certainly need their colour phase adjusting so that the colour subcarrier from each source is the same phase at the mixer, and here delays introduced by different lengths of cables will introduce errors, 1° for around 8" of coax.. This time select a half mix on the mixer and adjust the colour phase of the genlocked camera so that neither source loses colour as you mix between, beware of 180° change in colours as the mix is performed ie Blue flesh tones. Needless to say there is test equipment available to help make these adjustments, but a vision mixer with horizontal wipes and mix will get you there with a little fiddling. Genlock input on cameras is often restricted to the more up market professional cameras. I did find a range of CCTV camera's which had this facility, but alas they were only black and white. Ok for captions but I think we would all expect colour on our production. A word of warning black and white TV signals do not have a colour burst as part of the signal and this may cause problems if you mix them with colour cameras, it depends on the vision mixer.

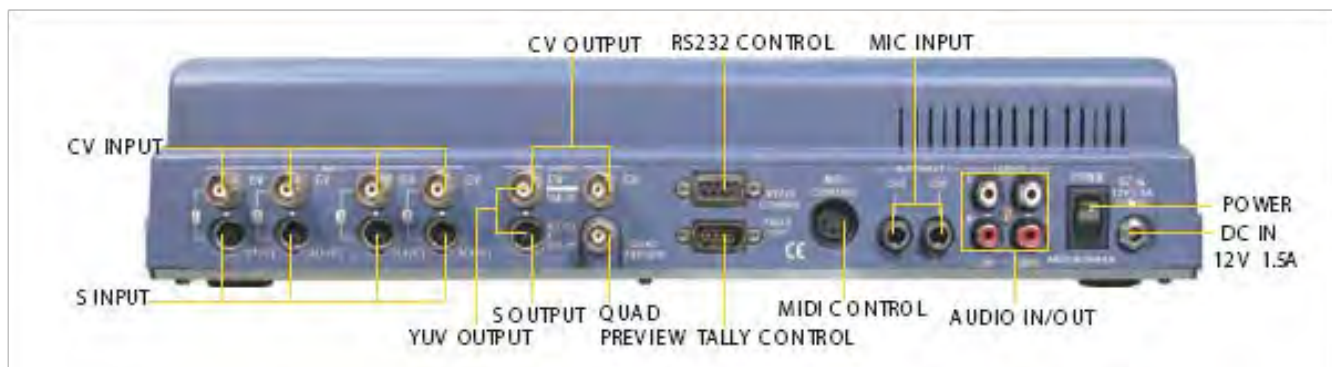


Vision Mixers come in all sorts of flavours the one used for the Microwave weekend and AMSAT is home made, and there have been designs in past CQ-TV's to build your own, but broadcast ones are becoming affordable, one very popular broadcast mixer is the GVG 100. It is small, reliable, and was produced in considerable quantity. It may have been an expensive piece of broadcast equipment, but they now change hands on Ebay for a few hundred pounds.

Beware some of these ex broadcast mixers will only work with sync pulse generators providing mixed sync and mixed blanking as a reference. The more modern mixers will lock to a black and burst signal, this could be a feed of our reference camera video. The GVG 100 and 110 will lock to black and burst providing they are equipped with the optional module, they are rarely found without this internal plug in module but just sometimes it is missing. Using the video from our reference instead of black and burst or colour black may also

cause problems on the mix to black or fade capability of the mixer it depends on the mixer and how this is carried out internally.

Vision distribution amplifiers are an inexpensive piece of kit and again there have been circuits in past magazines that enable you to build your own and at least one would be required to feed the reference signal to each piece of equipment looping reference between cameras is a fraught practice and if TV sets with AV input are used as monitors then a second distribution amplifier would be required (TV sets do not have video loop through). One monitor per video source is required to view all your video sources and one for the mixer output. You are now in a position to feed video out to the streaming computer which will need a video card or USB capture device to accept the video signal, streaming software and a good internet connection. Is this starting to sound like a complex rig or are there alternatives?



**Vision Mixers with Synchronisers**

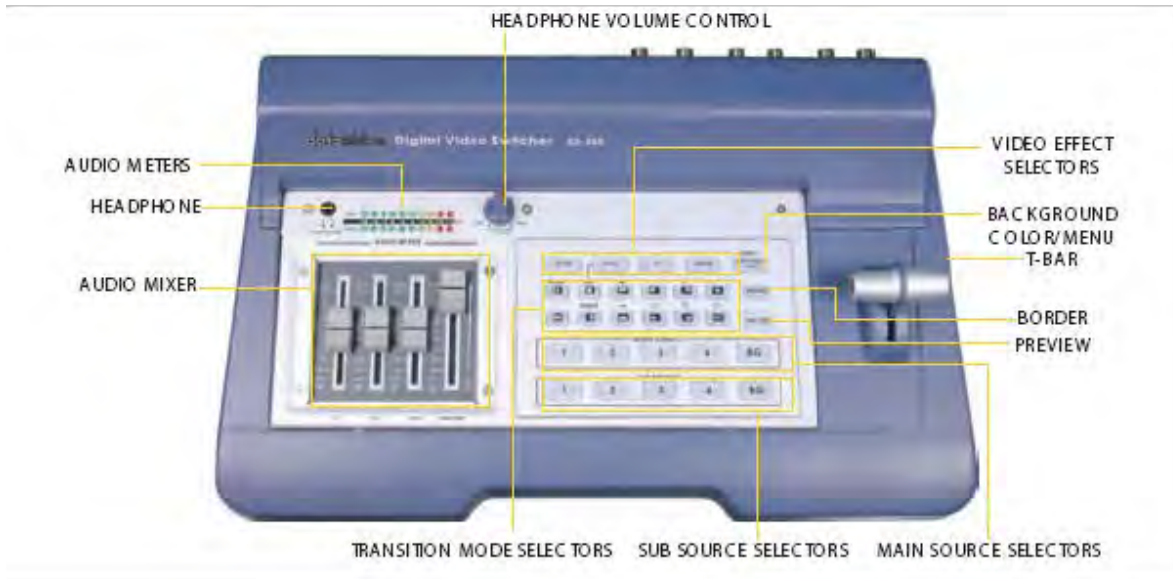
Genlock does have its limitations, not every camera has a genlock input, or if the camera is being used with a small RF link across a large lecture theatre or from an adjacent room then you need an alternative solution and there are several options.

Some time back Panasonic introduced a range of vision mixers which would accept non sync inputs and sort out the

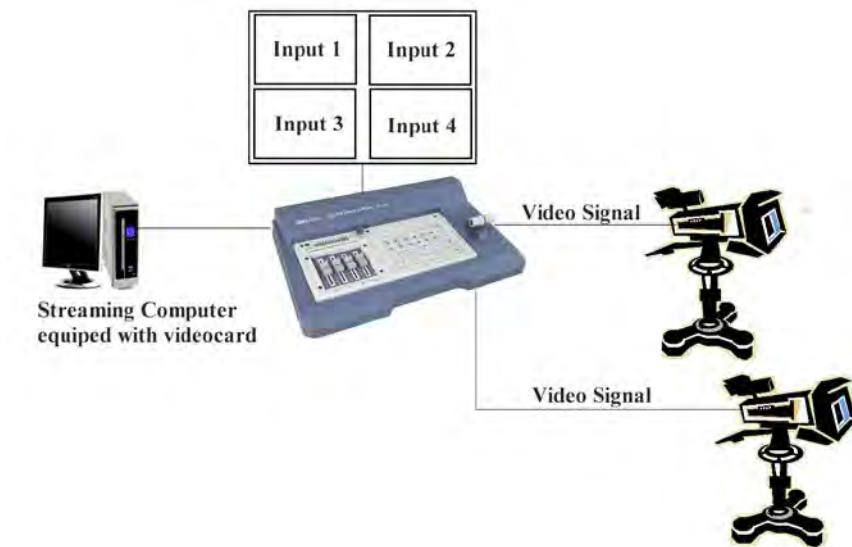
problem of these non synchronised sources internally with field store synchronisers (long electronic delay lines that could be commanded automatically to delay one source enough to bring it into synchronisation with another) and maintain this relationship even for non genlocked sources (back to getting the cars side by side when they may be doing different speeds) The first one was the MX5 and its big brother was the MX50, this enabled non genlocked cameras to be mixed without any of the above

problems. Again MX5 mixers change hands on Ebay at reasonable prices, or if the coffers will stretch to a new mixer then Datavideo do an excellent range of synchronising mixers.

The Datavideo SE 500 also has an in built audio mixer and one mic amplifier its bigger brother the SE 800 has two mic amplifiers. This sort of technology reduces the amount of kit you need to carry and rig including monitors.



4 Channel Vision Mixer featuring S-Video (Y/C) and Composite video inputs. Features include Dissolve, Fade, Wipes, Splits, PIP and Colour Processor. Channels are internally synced via a built in dual channel TBC 4:2:2 frame synchroniser. Component (YUV) via breakout cable, S-Video (Y/C) or Composite Video output. The SE-500 uniquely displays all 4 input sources via a single quad output including a Tally Light indicator on each input meaning the user only needs 2 video monitors – one for all inputs, one for output. The input display will also automatically change to preview the next transition if selected. The unit can be manually operated or controlled via RS-232 interface.



<http://www.datavideo.info/en/products/se500.shtm>

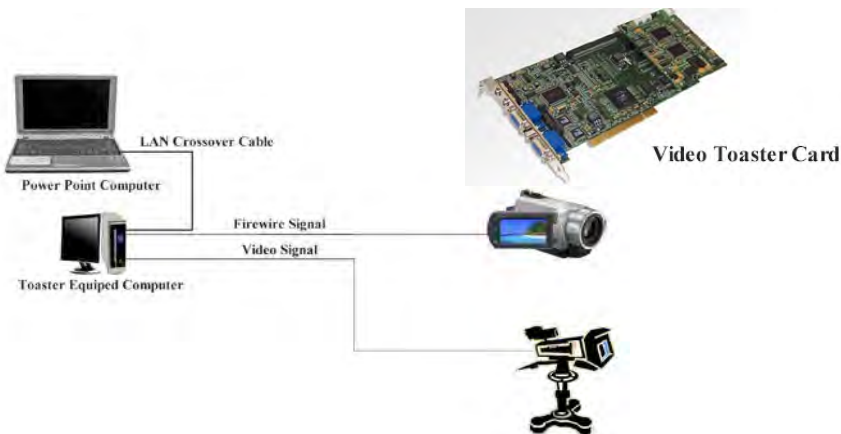
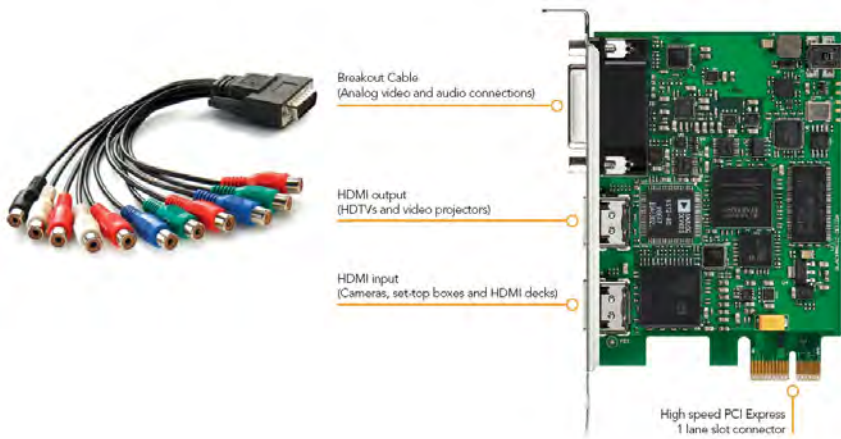
The SE 500 has a quad multiplex picture output, enabling a single monitor to display four pictures on one monitor.

**Integrated production suite**

An alternative to standalone hardware is to use a PC with custom software and hardware cards one such option is produced by Black Magic and is called the intensity video card, <http://www.blackmagicdesign.com/products/intensity/on-air/> if you splash out on two of these cards you can run the Black Magic software on your computer that will turn it into a two input vision mixer and also provide a display that will save you the cost and problem of monitors

**Black Magic Intensity card.**

Again the system has built in synchronisers so inexpensive cameras can be used no need for genlock it is all taken care of in the computer. The monitors are replaced by a mixer display on the computer screen. The only downside is you need two intensity cards for a two camera production. There is also an internal video graphics generator that with a little foresight, it might be possible to use this to generate graphics relevant to the lecture. The Black Magic card will also work with



HD which is a little above our streaming. Two cards and a computer cost a little less than the Datavideo SE 500 mixer and it will record your production to the computer hard drive, but then so will the streaming computer (more later). The SE500 has better effects a sound mixer and is more portable.

**Video Toast Anyone**

This is not the only option to solving this problem Newtek also offer two non HD solutions. Lets start with the older solution, <http://www.newtek.com/> the Video Toaster in its basic form it's a PC plug-in card (PCI X) module that will provide composite, component, s video, or composite inputs and outputs to the PC. It has a very pleasant vision mixing panel and two on screen monitors, one snag though in its basic form you cannot mix between these sources, you need the additional break out box SX8, which will double the cost, The basic card without the break out box will let you mix one of its video sources and a firewire input on the machine, so one PAL composite camera and the family camcorder (providing it has firewire) and you are into two camera production, again the cameras do not require genlock, its all synchronised by toaster. Firewire cables do have length limits, which used to be a problem but now 10m and 20m cables are possible, and repeaters can be added if you really need more. Another plus for this system is on the later software version 4.5 onwards it will also mix to the screen of another PC, via the computers LAN connection its called IVGA. So if this other computer was presenting a Power Point Presentation, you can have this as a source on toasters vision mixer i.e. one Firewire camera, one inexpensive non genlocked camera, and a feed of the lecturer's power point

Toaster will also record your production on the hard disc and allow editing of the recorded material, when you get it home, well sometimes we don't get it right first time. The mixer will provide more than wipes or mixes it has digital effects. Also if you have any pre recorded material stored on the hard disc it will allow this to be played into the production a sort of virtual video player which will play video's from a preset point in the order they are entered

into a play list. It wont handle HD TV, it pre dates the intensity, but they do turn up second hand, look around.

Another option from Newtek is the Tricaster this is a complete system, PC complete with plug in card and breakout box its a smaller breakout box than the toaster because of this, the breakout box will only handle three video sources, it has three camera monitors built into the display.

### Newtek Tricaster

Integrated Production suites are not cheap but you do loose a lot of hassle over carting monitors setting up conventional genlock cameras etc, you gain the ability to record the production onto the computers hard disc, and some packages have integrated editing facilities, caption generators, and digital effects, Try rigging all that in conventional hardware

Just take a look at Tricasters block diagram and see what it will handle for you including a sound mixer and mic amps.

Now we have the production hardware up and running we need to connect to the streamer you will need a PC and the free software from Adobe:

[www.adobe.com/products/flashmediaserver/flashmediaencoder/](http://www.adobe.com/products/flashmediaserver/flashmediaencoder/)

when you get it installed and running you should be confronted with a control panel. The left hand panel sets up the streaming rate and format and the right hand panel is the address to which you want to stream to, if you apply for a members free streaming account, you will be given these details

Once you have the server input address correct you need to press connect, if this turns to disconnect, the syntax or address is wrong and it will not connect.

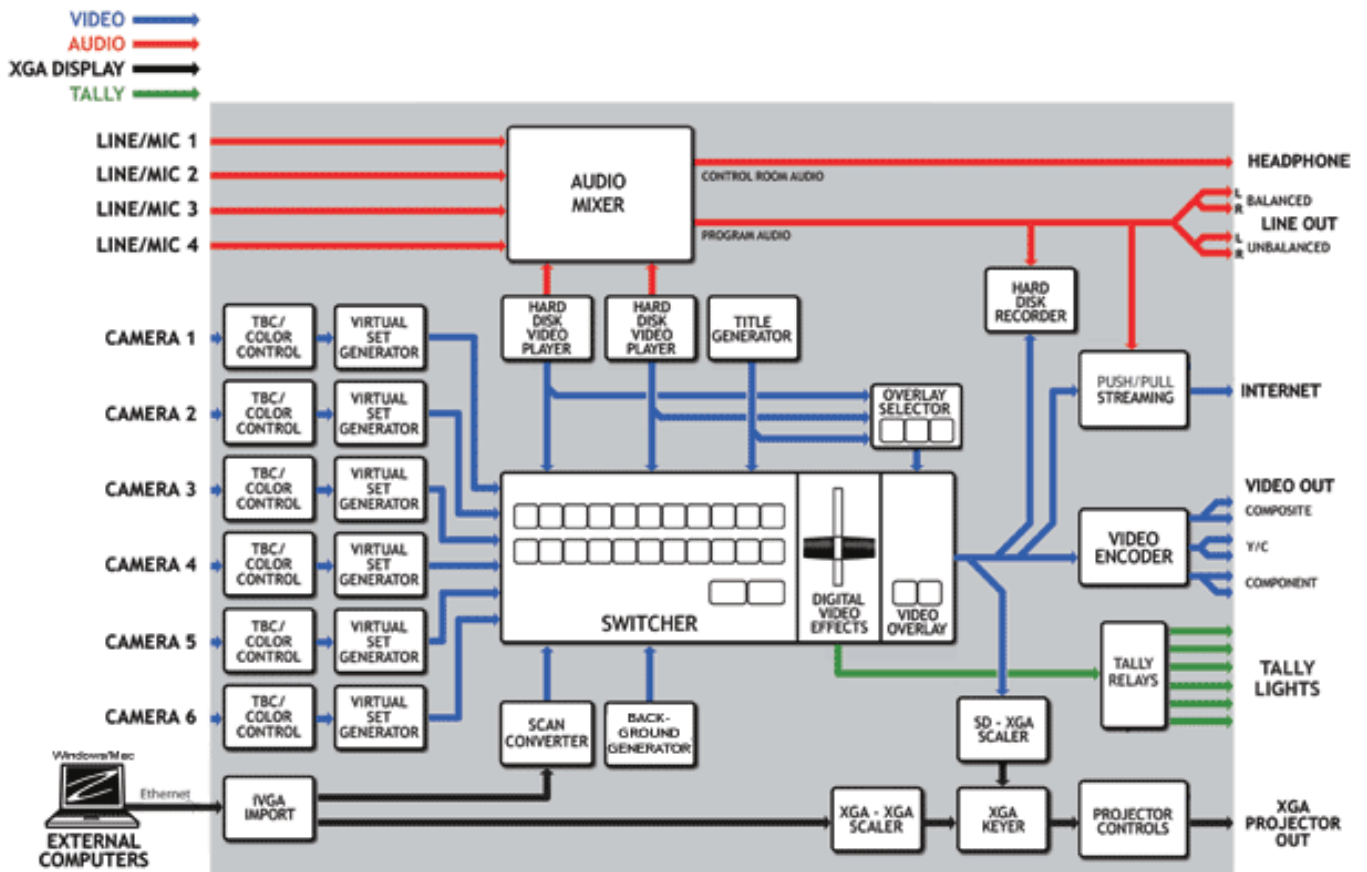
Then you press the start button at the bottom of the screen. Watch the log file on the RH side, look for excessive frame dropping, this usually means the Internet uplink is not supporting the bit rate you chose. Back off the bit rate and or frame rate until frame dropping is very low, or ideally zero.

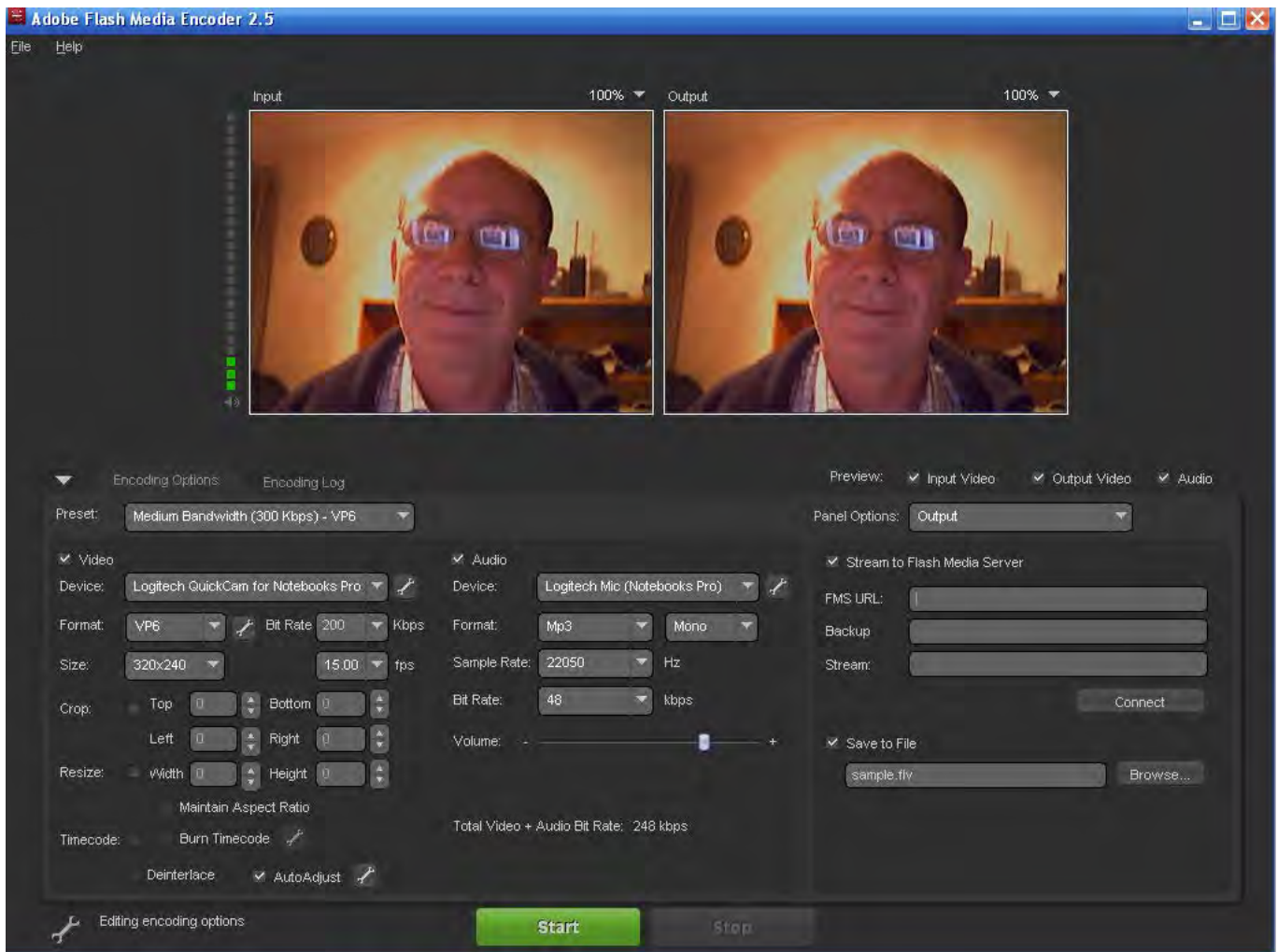
Failure to check this point causes the system to extend the delay through the system.

As a guide start at 200Kbit and 15fps with mono sound, and then work upwards if you have a suitable uplink speed. Most ASDL uplinks are about 200Kbit, don't assume you know what it is, measure it, by checking into a London port via [www.speedtest.net](http://www.speedtest.net). You might get a surprise. Another useful feature is you can record your transmissions on the computer hard disc by ticking the save to file and browsing up the directory you want to save the data in. The data will be stored as an FLV file which is a very compressed format, this is the same









format as the site video archive so if you have recorded a programme you think others would like to see you can either save the file to disc or by arrangement FTP transfer it to the batc streamer site

Integrated production suites are an excellent option, but at the time of going to press we have been unable to get a single PC to perform both the production process and the streaming. Some of them will perform windows streaming but seem a little reluctant to perform Flash streaming and operate production facilities at the same time.

The fix has been a second PC dedicated to streaming using a USB capture device and running the free streaming software. I hope these notes have been of some use and help you through the equipment jungle and enable you to stream an event, there is a lot of experimentation required, before you start in anger. To this end we now have a members streaming section on the site where you can experiment with equipment.

The links below may also provide you with further information

<http://en.wikipedia.org/wiki/Genlock>

[www.youtube.com/watch?v=nymVNhy4dw8](http://www.youtube.com/watch?v=nymVNhy4dw8)

[http://en.wikipedia.org/wiki/Video\\_Toaster](http://en.wikipedia.org/wiki/Video_Toaster)

[http://www.metacafe.com/watch/206709/master\\_tricaster/](http://www.metacafe.com/watch/206709/master_tricaster/)

<http://www.labnol.org/internet/video/flash-video-editing-guide-split-flv-extract-mp3-music/2488/>

<http://www.holdan.co.uk/datavideo/se500.htm>

<http://www.mivs.com/technical/appnotes/an005.html>

<http://www.karlklomp.nl/inf/faq.html>

The clubs streaming website:  
<http://www.batc.tv>

The clubs main website:  
<http://www.batc.org.uk>

# The 2008 BATC Rally and Biennial General Meeting

by *Graham Hankins*

A final reminder in print that our 2008 BATC Rally and Biennial General Meeting is now just a month away! As last time, it will be held in The Village Hall, STOW-CUM-QUY, which is near Cambridge on Sunday 5th October.

I am delighted to be able to state that a representative from the Civil Aviation Authority will be giving one of the Lectures (subject to any emergency callout on the day). John Banks, Technical Manager, Surveillance and Spectrum Management.

Emails: "Graham, I have been passed your letter requesting a short talk on the spectrum issues in the 23cm aeronautical radar band relating to amateur TV. I have been involved in this issue in the past and I am provisionally available for that date (last minute emergency work commitments permitted). If you would like to pencil my name in to the programme perhaps we can speak nearer the time to firm up on the details".

Obviously, the new BATC TV streaming will strongly feature so another lecture will be from Mike Cox, titled 'Up Stream'. I have also asked Brian Summers if he can present a talk on TV camera technology past and present – Brian S is on holiday at the time of writing.

All lectures will be recorded for streaming and copying to DVD.

In the main room of the Village Hall, member Mike Hastings will be demonstrating his Digital ATV setup, Ian Waters will be demonstrating a DATV link to the Cambridge ATV repeater GB3PV. Trevor Brown will be showing BATC TV, if a suitable internet link can be arranged.

On the 'trader' front, one trader confirmed quite early after the venue and date had been decided, other traders eg. Stuart Marshall G6NHG and Nigel of 13cm.com have been invited but have not replied at the time of writing – keep watching the BATC web site!

So, on the day, the doors open at 10am:

11am - Lecture Programme starts; final 'running order' will be announced on the day.

3pm Biennial General Meeting.  
Chairman's report  
Treasurers' report  
Secretary's Report  
Election of Committee  
Awards  
4pm Close

But remember - our rallies and BGM are for the members - not just to elect a committee!!

ATV Repeater Groups: All ATV repeater groups are STILL invited! Please contact me!

IMPORTANT DIRECTIONS: Stow is just east of Cambridge off the A14 and close to Junction 35. Take the A1303 off J35 BUT BE VERY CAREFUL to peel left off the A1303 within a VERY SHORT DISTANCE after leaving J35. There is a small sign to Stow. MISS THIS LEFT TURN and there is 'no going back' for 20 MILES! A map should make this turning clear. Put CB25 9AW into your SatNavs!

So, I hope, after 9 months of deciding a venue, inviting lectures and traders etc, we get a good turn-out on the day! And don't forget, the timetable is STILL open to more lecturers, traders, demonstrations etc! ANY changes will be announced on the 'Latest News' page of the BATC web site.

Graham Hankins G8EMX

[g8emx@tiscali.co.uk](mailto:g8emx@tiscali.co.uk)



## News from the Severnside TV Group

The Severnside Television Group have revamped their web site. It now has more information on their two repeaters, GB3ZZ and GB3XG, including a live stream of 'ZZ pictures.

Also added are short tutorials on repeater operation and getting started on ATV, aimed primarily at the non-technical minded rather than experts. Please note that their email address "contact@..."

will be taken out of service in the next week or so and has been replaced by an on-line response form.

The 'refurbished' web site is still at:

<http://www.stvg.co.uk>

The Severnside Television Group are affiliated to the BATC and is one of the largest and most active groups in the

UK, they are based in the Bristol area but have members from much further afield. Their repeaters cover much of the area in the upper River Severn estuary and surrounding counties.

GB3ZZ is also streamed on the clubs new website where there is live chat available to communicate with other viewers.

# Small Outside Broadcast at short notice

by Peter Blakeborough

Thanks to the extensive effort by Chris G1FEF, the early implementation of the batc.tv streamer became a reality a few weeks before the first of two events the committee had considered broadcasting on the new streamer service. Urgent telephone conversations with Peter G3PHO the organiser of the Sheffield UK Microwave Weekend, indicated it was possible but there were still a number of unanswered questions, not least of which was the availability of a suitable internet connection with a good up link capacity. In the event the problems were overcome and enough video and audio equipment was assembled to run a two day live event.

No time was available for pre assembly or pre rigging at the Sheffield venue, but in the preceding days the Blakeborough household dining room was made into a temporary rig to prove the system before transporting the equipment 250miles to Sheffield.

The planned test of the Streamer encoder the day before the event, went well, and we had at least 350Kbit on the up link and 3Mbit on the down link. The feed into the Sheffield radio club port had to be WiFi but it looked very reliable.

On the first day of the event we knew 1 hour at the most was available to rig a two cameras shoot with vision mixer, down stream keyer, monitors, radio mic and lazy mics. We made it on air with 4 minutes to spare and a firm resolution never to arrange a wire from scratch system again!!!!

Two lecture sessions down stream the system was working well, apart from the need to have several more arms and legs. The term Octopus operators was coined, and all involved nodded quietly in agreement after they operated the system for 30min.

The whole process was an experiment to understand the organisational logistics for, and equipment needs, for a two cameras table top operation.

In the event, help was at hand and some what apprehensive radio amateur volunteers, learned how to drive a BVP7 camera, vision mixer and simple sound mixing in the space of a few hours.

## WEB monitoring.

We could monitor the Internet feed off the WEB and we began to receive good feedback from users around the UK and later in the day from Australia and New Zealand. Some problems were reported on low sound levels, which were later traced to the way the batc.tv gui set the volume default to 10% (later corrected).

One Dell laptop (1.4Ghz) performed the Encoding of the video stream (VP6) at 250Kbit and we ran 48Kbit on the mono audio with a total bit rate just under 300Kbit. The Adobe stream Encoding v2.5 worked well, processor priority was set for encoding, but a reasonable decode from the batc.tv site was also possible. We used 15fps for the frame rate which was a compromise between reasonable movement and net up link bit rate.

In earlier test it became clear the management of the net bitrate was a key issue if net system delay on the internet was to be kept to a minimum. The Encoder software has monitoring tools to report frame dropping on the up

link to the encoder. In the event we only saw 2 or 3 frame drops per hour, and the overall delay was 2.8 Seconds of which 1.3 second was the encoder, quite a remarkably low end to end system delay compared to earlier streamer systems.

## Operational logistics.

One camera was locked off immediately in front of the presenter projector screen and second camera BVP7 was used as a manned camera. Light levels were desperate. The 2 input analogue vision mixer had no synchronisers and the cameras were gen-locked.

The mixer had a Down stream keyer which was driven from a "Black Box" text generator, it worked very well, providing inter session caption advice on the WEB. Full bandwidth DV recording were made for later editing and presentation on the batc.tv server archive channel.

No talkback was available or planned, and the table top was placed at the front and to the right of the audience giving the camera man site of the vision mixer monitor and his unannounced vision mixing intentions. (Who needs talk back?)

As time passed the cameraman learned to anticipate the events and the improvised hand signals from the vision mixer who



I am sure must have had some practice as a race course “Tick tack man”.

The event went well with only one “dead radio mic” cable to deal with. Feed back from users on the internet was limited until part way through the second morning, when, after a question from the floor, a reply came from the back of the audience. It was at that point I realised Chris G1FEF had managed to implement the WEB chat line associated with the stream, giving the answer to the question raised.

From that point we had messages from all around the World some with questions, most with thanks for streaming the lectures.

#### **Lessons to be learned:**

80 % of the rig must be made before the event, and preferably on wheels;

Radio mics were essential;

Confirm by measurement the internet up and down link band width well ahead of the event, it is quite a surprise to most users how small the up link bandwidth is available;

Extra camera men and vision mixers is a must, all the work is achieved “on the fly” and after 2 hours continuous concentration you need a break and

“cup of coffee”;

An improved synchronised Projector to Pal device was needed for a direct feed of the PowerPoint material. Some detail on the presentation was much too detailed to reproduce on the Streamer.

#### **AMSAT \_UK**

Encouraged by the results from Sheffield plans were made for the AMSAT –UK event at Surrey University Guildford.

In the week before the event my metal work and carpentry skills were tested to the limit to make a small wheeled trolley to house the presentation electronics. Later christened MicrO-B, 80% of the cabling was within the trolley, rig became easier.

The Lecture hall was an excellent venue with radio mics and desks mics in place, lighting again posed some issues, as the main aim is the give a good contrast ratio for the projection screen.

The WEB test produced 15Mbit on the uplink and 25MBit on the down link, rather more than we expected. The university high speed JANET internet was generally reliable but we were bounced off the DHCP server on two occasions and had to hurriedly reconnect. Later a second port was made available, it only highlights one

of the more venerable technical aspects of Live Web streaming.

Thanks must go to the volunteer camera men and vision mixer in the form of Evo and Graham G3VZV without which the task would have been quite taxing.

The lecture quality was very high and the reaction from the World Wide audience was extensive. The chat line feedback was this time integrated in the Q&A at the end of the lecture sessions, the very low delay in the streamer system making the Q&A quite a responsive arrangement.

The much used broadcasters phrase “Content is King” was frequently reinforced in my mind, the organisation and quality of the presenters and their work was first class.

Thanks to UK microwave group for the Sheffield and AMSAT UK for the events they organised.

The Live streaming was organised at short notice to determine the value and viability of using “Live event” on the new batc.tv channels. From the World wide reaction and thanks received we concluded it was a resounding success.

Try [www.batc.tv](http://www.batc.tv). and see for yourself.



# Contest News

## BATC Summerfun Contest

After all the excitement of the March Repeater Contest, the Summerfun contest was very quiet. I received one formal entry from the North East ATV Group, M0DTS, G0EHV and G4FVP. Their scores were:

## BATC SummerFun 2008 Contest Results

### 23 CM

Place	Call Sign	Points	Locator	QSO	DX	DX Loc	Km
1	M0DTS/P	396	IO94LI	1	G0DPS/P	IO93AP	99

### 13 CM

Place	Call Sign	Points	Locator	QSO	DX	DX Loc	Km
1	M0DTS/P	495	IO94LI	1	G0DPS/P	IO93AP	99

### 3 CM

Place	Call Sign	Points	Locator	QSO	DX	DX Loc	Km
1	M0DTS/P	990	IO94LI	1	G0DPS/P	IO93AP	99

### Overall Results

Place	Call Sign	70 CM	23 CM	13 CM	3 CM	Total Points
1	G4PYD/P	0	396	495	990	1881

Thanks also to Rob and the team for their great photographs.

Unfortunately, Mike G0DPS lost his logsheets, but managed portable operation on 3 bands on his own – no mean feat. Additionally, Dave G0DJA was active, but did not succeed in making any video contacts.

### March Repeater Contest

After I had published the results of the March Repeater Contest, I heard from Des G3NNG from Faringdon who had submitted an entry that had not reached me. He scored 3196 points using GB3UT and GB3BH, which would have put him as the clear leader. Well done Des!

I aim to acknowledge all entries I receive by e-mail within one week; so if you don't hear from me after submitting your entry, please assume that I haven't got it and try again. I would rather receive multiple copies that miss someone out.

### IARU Region 1 ATV Contest 13/14 September 2008

This year's contest is "hosted" by the BATC. This means that we are responsible for compiling the International results. It would be really good to have a substantial UK entry so, even if you only work one or two stations, please submit an entry. There is a new contest entry spreadsheet on the BATC web site, which I am keen for people to try; however I will welcome any entries using the old spreadsheet or on paper. If anyone wants some paper forms, please send me a stamped addressed envelope.

I am aware that the IARU Contest normally clashes with the IBC Exhibition in Amsterdam. Next year's contest would normally take place on 12/13 September 2009. Can anyone suggest a better date that I could propose to the IARU?

### December Repeater Contest

The next repeater contest is due to take place on 6/7 December. Remember internet and repeater linking are within the rules, so there is lots of scope for innovation.

### Digital Contesting

The March Repeater Contest saw the first contest entries using digital QPSK transmissions. Now that activity is increasing on 70cm (relatively) narrow bandwidth digital, there is the potential for some long distance contest QSOs – especially with the recent availability of surplus semiconductor PAs capable of handling digital signals linearly at the legal limit. Time to start constructing for next year?

### 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.

## Contest Calendar

1800 UTC 13 September 2008- 1200 UTC 14 September 2008 - International ATV Contest  
1800 UTC 6 December 2008 - 1200 UTC 7 December 2008 - BATC Repeater Contest  
1800 UTC 21 March 2009 - 1200 UTC 22 March 2009 - BATC Repeater Contest  
1200 UTC 6 June 2009 - 1200 UTC 7 June 2009 - BATC Summer Fun Contest

# Letters to the Editor

Hello Chris,

Some good news about Alexandra Palace, posted on the British Heritage Television Group Forum (BHTG) yesterday, Tuesday 19/8/08, by Martin Allen:

“The following press release has been circulated this afternoon:

The Alexandra Palace Charitable Trust has received notification from Firoka Ltd that the developer is no longer interested in being involved in the future of Alexandra Palace.

This comes after over a year of negotiations between the Trust and Developer.

Matt Cooke, Chair of Trustees, said: “As this option for moving forward closes I am determined that we will grasp the opportunity this now gives us to explore new ways of realising our objective of securing Ally Pally’s future in an exciting and sustainable way.

I will be taking proposals to the next meeting of the Board which will be about that future and learning the lessons of recent months, years and decades. The Trustees will now focus on reviewing the various options open to them in order to ensure that the charitable objectives of public resort and recreation are maintained. We will take this opportunity to ask the difficult questions and seek realistic proposals for the Palace’s future.

“During this period of negotiation we have not been idle and a tremendous amount of work has been done in reinvigorating our trading company culminating in the appointment of a new Managing Director last week. This work gives us a solid foundation for the future - a future which could be tremendously exciting for the Palace.

“Local people and beyond see pure potential in the Palace, and we have a duty to Haringey and all of London to secure and realise this tremendous asset’s future.”

(Notification of the above statement to BHTG by kind courtesy of the SaveAllyPally campaign)”

I’m very pleased that Firoka has lost interest in Ally Pally, as their intentions were solely financial, and paid scant regard to the intentions of the benefactors who donated the Palace to the people for the charitable objectives of public resort and recreation.

Perhaps now those /intended/ charitable purposes will be given proper consideration - and that the former BBC Television Studios will be properly preserved, in their present location - something that Firoka was \*not\* going to do.

The BHTG is working towards re-starting a 405-line Television service, on the original Band 1, Channel 1 frequency, from Ally Pally, as soon as they possibly can. Work is in hand refurbishing an ex-BBC Transmitter for this purpose!

If you’re interested, you can read more about it on the BHTG Forum at:

<http://www.405-line.tv/phpBB3/>

Regards,  
Dave.

Dear Sir,

I confess I am not a Member of BATC. I am a retired professional TV Broadcast engineer( Central TV) with a lifes interest in Amateur Radio.!

I am currently researching ‘Stereo Photography’ as might be applied to the

‘personal Computer’ and, as quite often occurs, .One aspect of the display system for ‘Stereo photographs’ has already been described in an article published in ‘Practical Television’ round about the 1960s -1970s. The information I require, was contained in the novel invention of a colour TV display system .utilising ‘controlled polarized light’...I have diligently searched the ‘Net’ for information relating to that article in Practical Television , (Now defunct of course) without success.....A Colleague from Central who I chanced to meet (A member of BATC) suggested I wrote to you. Perhaps one of the elderly members of BATC might recall the article and could guide me in my search for information about a very interesting phenomena, utilised cleverly, so many years ago!

I would be so grateful for any help you can give me in my search .

Yours, most  
Peter Short  
Tel 0121 4306 989

Dear Chris,

Thank you for voting my entry as the winner in the CQ-TV 221 issue caption contest.

As this was my 1st entry I’m very pleased that my efforts won the prize. The caption generator will be a very welcome addition to my station as I’ve only just started up and, up until winning the caption unit, was using paper and black felt tipped pen to generate my callsign/locator details.

Good luck to the entrants for the future competition and I look forward to making good use of my prize when it arrives.

Regards  
David Ackrill (G0DJA)

Sir,

I was interested to read Trevor Brown's piece about Christmas Tapes.

It may have started from ABC's Teddington Studios in the 60s.

At that time, there was a programme promotion exchange every Thursday morning in which the ITV companies would put out trailers for upcoming programmes. The exchange was moderated from Teddington by a character called Ron Walsby. Odd funny bits started to appear, such as ATV's "line-up" of a man holding a saw next to a set of teeth, and another man playing a penny whistle.

Saw tooth and tone!

Another time a bed was moved into Teddington VT [TR22s], and Norman Andrews was "asleep" in the bed, with an old fashioned large alarm clock next to the bed. When it went off, Norman's arm appeared from the bed, and pressed the TR22 play button to start ABC's promo.

There were others, and I suspect, grew like topsy into the Christmas tapes that we knew and loved.

There was, of course, the Child's Guide to Colour Television, No.1 - Colour Video Tape, which put forward the proposition that you took a black and white tape and painted it. This was made in Teddington for a Post Office Colour Demonstration lecture in Birmingham, at a time when we had the first EMI 4-tube colour camera prototype in for a while [1964]. It was sent to Birmingham in NTSC, and recorded in SECAM. Unfortunately, the tape disappeared in the late 60s.

Another bit of history.

Yours sincerely,

Mike Cox  
ABC TV, 1961-1968

Hi Chris,

Sorry I took so long to get back to you, I've been very busy and travelling. I have been living in Sydney since June 2001 and bought a house here in 2004.

There are 2 ATV repeaters VK2RTS at Lawson in the Blue Mountains in on 23cm out on 70cm and VK2RFM at Oakdale in on 70cm and out on 23cm. They don't see each other, weak syncs only. There is not much activity with 4 of us on regularly and one or 2 others occasionally. So when I got broadband a few months ago and could sit and watch GB3HV it was just amazing.

I bought a graphics card with VGA plus PAL out so I could watch on HV on a normal TV (which looks better than on the PC). I was then able to relay GB3HV on VK2RTS so everyone here could watch as well. At this time of year, there is a 9 hour time difference with the UK so it makes it difficult to catch people on the air. Then, of course, there was the frustration of only being able to watch and not transmit back (other than ringing someone up in the UK to say I was watching or using the chat facility). Then Noel G8GTZ showed me how to access HV through Netmeeting so I could not only send pictures on HV but also talk to people at the same time which was how I was able to take part in the ATV contest. That was pure luck, I didn't know it was on I just saw it happening and rushed out a 4 digit number to show with the webcam.

I had some fun with the entry details :-

Antenna - twisted pair  
Height AGL - 1m  
(phone cable underground)  
Station TX ADSL2  
RX ADSL2  
Output power 10mW

I didn't claim the distances from the locators at it's 17007km from here to GB3HV.

Thanks to Noel again, I bought a video capture card so I could send pictures from my ATV setup to HV. I then made some improvements to a sync processor built years ago for HV, when it was at my house, which was used to record the signals and regenerated the frame syncs to lock up the VCR. I added line syncs which allows me to capture weak ATV signals and send them over the internet. The only problem is that most of the bandwidth is being used to encode the noise; I could do with a noise reducer first. However, with pictures around P3 or better it works reasonably well.

I've also setup an account on Ustream and occasionally relay pictures on VK2RFM and VK2RTS and this can also be selected on GB3HV.

73 de VK2CRJ (G4CRJ) Gary

**TV-AMATEUR** die deutsche Amateurfunk-Zeitschrift  
für ATV bringt in der letzten Ausgabe z. B.

- Zweikanal-Audioverstärker wandelt Stereo in Monosignale
- Frequenznutzungsplan vom September
- Tongenerator mit 8 Pegelstufen
- Erste HDTV-Bilder vom Mond
- aktuelle ATV-Relais-Liste
- DVB-T-Senderversuche DD1KU

bestellen per Fax: 001149 231 48 99 2  
oder Internet: [www.agaf.de](http://www.agaf.de)



# 720P Sync and Test Generator – Part Two

by Mike Cox

## Summary

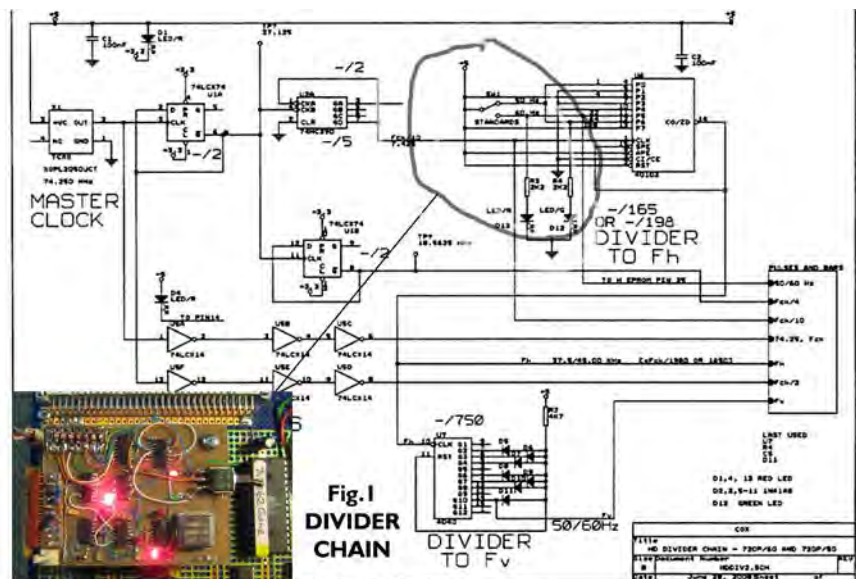
In Part 1, we looked at the 50 Hz divider chain together with the EPROM derived timing signals, and some of the Test Signals. Subsequently I felt that the 60 Hz world had not been considered, and so in this part we will look at the divider chain with a view to making it dual standard. [Why did those power engineers in the late 19th century make life so difficult for us? Why could they not stick to 60 Hz, or even 50 Hz for power distribution?] The H timing EPROM will need to be programmed with any different pulse widths for 60 Hz, and by writing separate pages, this section can be made multi-standard.

We will then look at the PLUGE and Frequency block sections, and finally we will look at the matrix to convert the RGB output to YPb'Pr'. Note that the coefficients for Y, Pb and Pr are not the same as those for PAL/NTSC

## Divider Chain

Because 720P/50 and 720P/60 have a common clock frequency [74.25 MHz], the divider chain is relatively simple. Perhaps a glance at the table will show the commonality.

Look at the revised divider chain [Fig. 1] to see the simplification we can achieve, firstly by removing the 1080i divider bits, and secondly by using the programming capabilities of U6 [74HC40103]. One two-way switch [SW1] is all that is necessary to change from 50 Hz to 60 Hz frame rate,



changing the 1980 division from the Master Clock frequency to 1650. LEDs in series with the pull down resistors indicate standard in use. The outputs from the divider chain remain as before. A wire from the switch is taken to pin 25 of the H EPROM [U4] to select the 60 Hz page and change the H timings.

If you only need one standard, then U6 can be hard wired appropriately. Fig. 2 shows the EPROM programming details.

## Horizontal Timings

As the number of lines is the same for 50 Hz or 60 Hz versions, the vertical timing EPROM remains as before. However, the pulse widths for the two versions are rather different. Horizontal Blanking for example is much wider in the 50 Hz version than the 60 Hz version, at 700 clock cycles, or 9.43  $\mu$ S. The active line time is 17.24  $\mu$ S for 50

or 60 Hz variants.

Because of speed limitations in the EPROMs used [70 nS parts], the address counter is clocked at 9.28 MHz, which is 1/8 Fck. Thus pulse widths are defined in multiples of 108 nS. A second page in the H timing EPROM can be programmed, and pin 25 of the EPROM taken high to select page1 [rather than page 0], using the standards frequency switch mentioned above.

The difference between the 50 or 60 Hz versions is small – one or two EPROM locations move for the whole active block.

## PLUGE

It will not surprise you to hear that PLUGE is programmed into an EPROM. The address counter for this is the Ramp timing counter [U15/U31 74HC193] in Fig.3. This counter is clocked at 14.85 MHz, derived from Fck/2 in a Phase Locked Loop [PLL, U13, and U14]. It counts up to 220, when the 74HC688 comparator [U16] changes state and via the flip-flop, resets the counter. The original version used an 74HC4040, a 10 bit ripple counter. The ramp was not entirely glitch free, and neither was the PLUGE output. A latch using an 74HC574 was inserted in the counter output, but it actually printed-in a timing error between two bits [5 and

Parameter	50 Hz	60 Hz
Master Clock Fck	74.25 MHz	74,25 MHz
Horizontal Freq. Fh	37.5 KHz	45.0 KHz
Horizontal Pixels	1280	1280
Aspect ratio	16 x 9	16 x 9
Horizontal Blanking	9.43 $\mu$ S	4.983 $\mu$ S
Vertical Active Lines	720	720
Clock cycles per line	1980	1650
Luminance Bandwidth	30 MHz	30 MHz
Chrominance Bandwidth	15 MHz	15 MHz

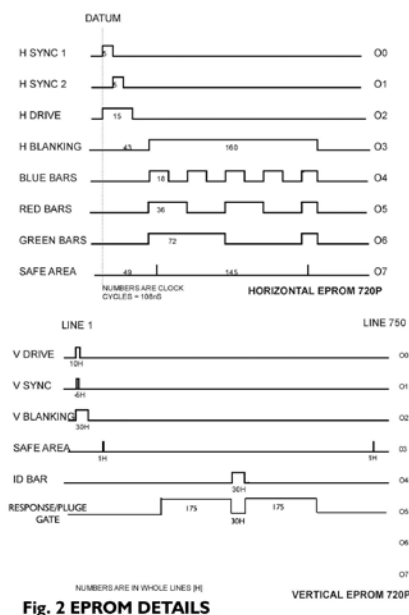


Fig. 2 EPROM DETAILS

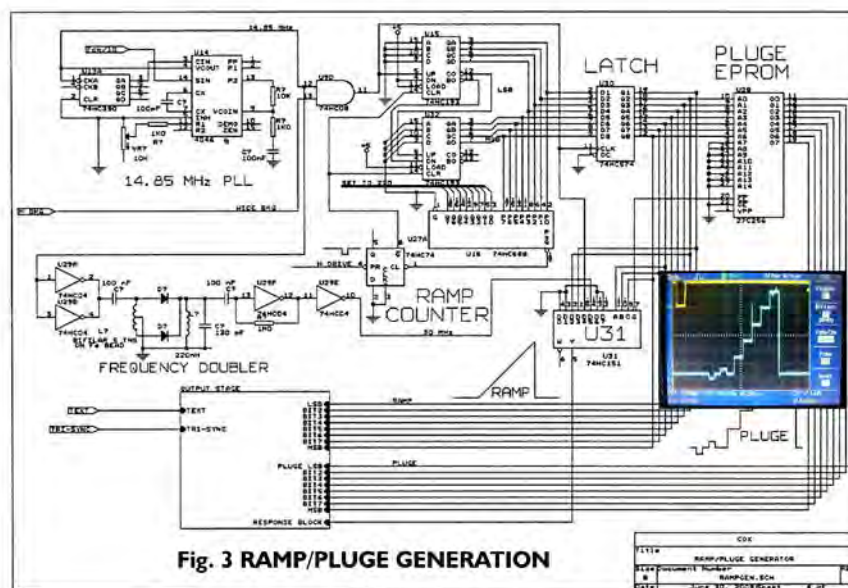


Fig. 3 RAMP/PLUGE GENERATION

6]. Because we are clocking the counter at 15 MHz, small delays through the counter can build up to a complete clock cycle at the latch output.

So learn from my experience; it is worth using synchronous counters at high speeds.

The PLUGE waveform [Fig. 3] comprises two small steps at left-hand side, one below black and the other just above. Video levels for these steps are about 3%. Further over, grey scale steps follow, with additional steps on the top level. These again are about 3% of video level, with one going negative and the other positive. These are very powerful tools for seeing if any peak clipping is occurring in the system. The 8-bit outputs from the EPROM are fed into one of the latches [74HC574] used as data crosspoints for pattern selection.

**Response Block**

This has been chosen to have blocks of frequencies [30, 15, 7.5 and 3.75 MHz] available in the divider chain from the Master Clock generator. All the frequencies are harmonically related to the Master Clock, and hence when re-locked in the selection latch, have no aliasing. An 8 to 1 digital multiplexer [74HC151] is used to select these frequencies, with the selection signal coming from the PLUGE/RAMP clock generator. The first two and last two inputs of the selector are grounded so the block appears in the centre of

screen.

**RGB to Y'Pb'Pr' Converter**

RGB is fine for driving computer monitors and flat displays, but for further encoding to HD-SDI or MPEG, luminance [Y] and colour difference signals [Pb' and Pr'] are needed, with appropriate band limiting.

Note the ' notation. This signifies that the matrixing equations are slightly different to those that we know and love from PAL and NTSC practice.

The equations are: -

$$Y' = 0.2126 R + 0.7152 G + 0.0722 B$$

[gamma corrected primaries]

$$Pb' = 0.5(B - Y)/1 - 0.0722$$

$$Pr' = 0.5(R - Y)/1 - 0.2126$$

**Bandwidths:-**

$$Y' = 30 \text{ MHz, sampling frequency } 74.25 \text{ MHz}$$

$$Pb', Pr' = 15 \text{ MHz, sampling frequency } 37.125 \text{ MHz}$$

See SMPTE 296M for further details, also EBU-TECH 3299

Standard matrixing techniques are used to form these signals. I happen to have a few LMH6551 devices in the drawer, and they make a good luminance summer. The have a balanced output so that +Y' and -Y' signals are available,

with equal amplitude. Adding B or R to -Y' in a virtual earth stage, using sections of an LMH6644, quad high-speed operational amplifier, forms the colour difference signals.

The circuit is shown in Fig. 4, while the lashed up circuit and its waveforms are shown in Fig. 5.

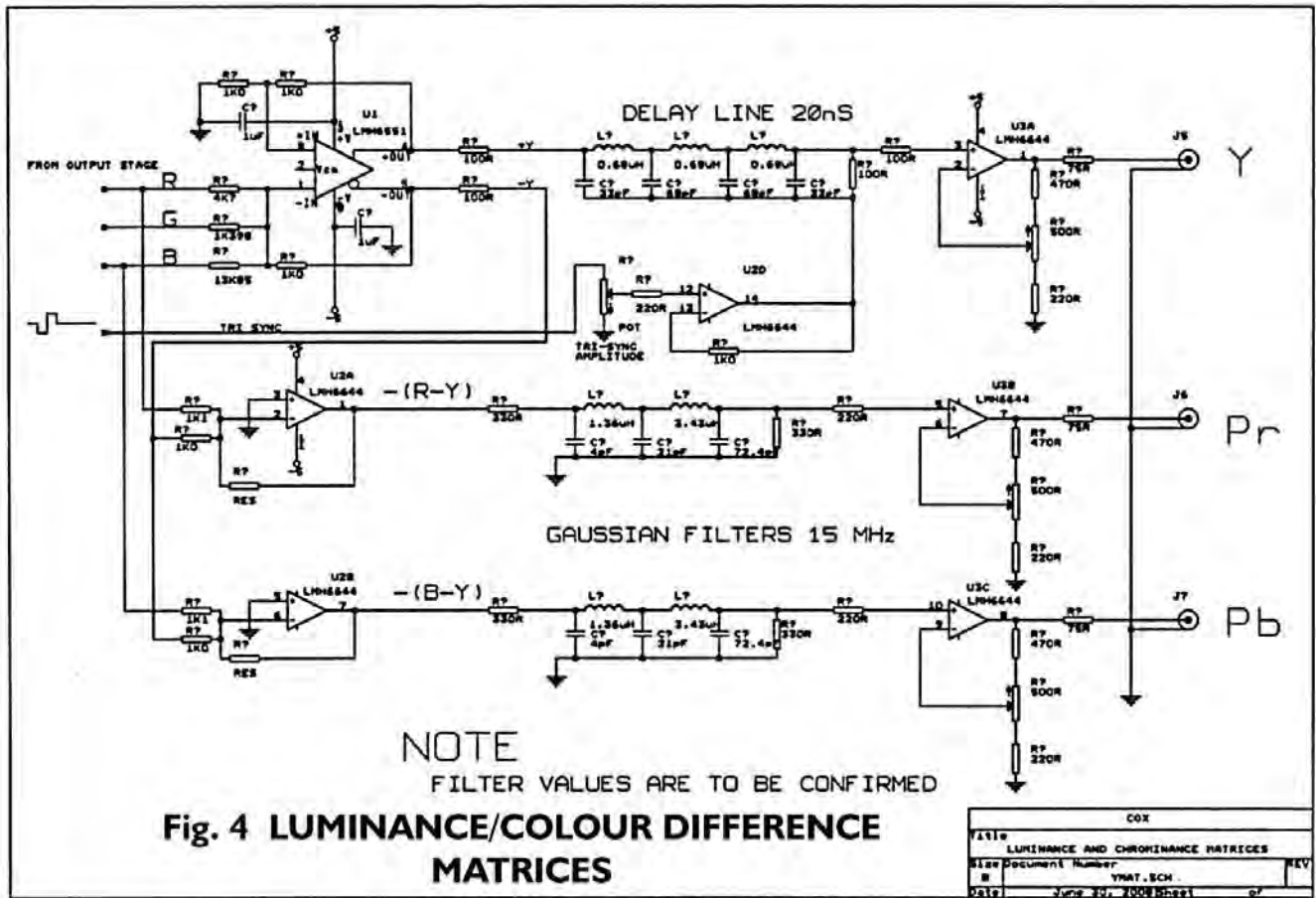
Filters are still being worked on, so are shown as blocks. They feed the output stages that feed the outside world, or a set of ADCs to give YCbCr for encoding.

**Conclusion**

The project was started earlier in the year, and has proceeded at the pace of the average snail, but there is a working 720P source at the end, still very much a lash-up. It has shown that some computer monitors will not support 50 Hz working. Fig. 6 shows Ramp, PLUGE and Response off screen.

If I can tidy it up a bit, I shall probably have it at the BGM in October.

If anyone wants any further information, contact me via the Editor. I will be pleased to help. I have one spare 74.25 MHz oscillator; if anyone would like one, please contact me, again via the Editor.

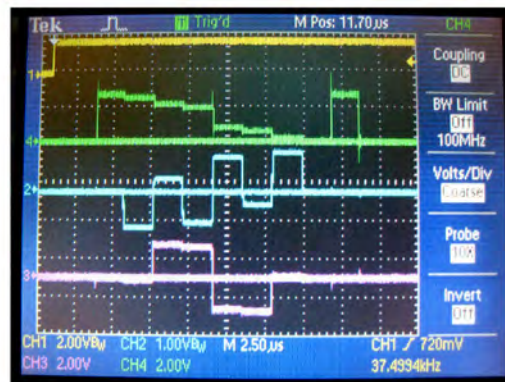
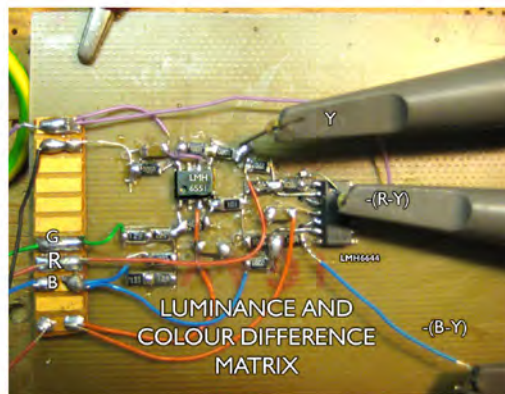


References: -

Part 1 of this article appeared in CQTV 222

PLUGE CQ-TV198 [article on XGA PLUGE generator]

www.ebu.ch  
www.smpte.org



# Turning back the pages

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

by Peter Delaney

CQ-TV 37 - "Ninth year"

John Tanner had settled into the editor's chair - although he apologised that it appeared a little later than planned, as exams had taken up a lot of his time just as CQ-TV should have been going to press. Details were given of the forthcoming Club Convention, being held in September in London. "Tickets are now available" the publicity stated - something members do not have to obtain to attend this year's BATC event.

Mention was also made of the Radio Hobbies Exhibition, at which BATC was expected to have a show - although likely smaller than in previous years. At the 1957 event, a 'TV Telephone' had been shown. Described as 'reminiscent of a GPO telephone kiosk, with its open side facing the crowd', it had a 14" monitor with the picture at eye level and a standard GPO phone on a shelf, and a picture from Ivan Howard's camera appeared on the screen when TEL was dialled. The visitor gained the impression that they were in two-way audio and video contact with the BATC operator. The BATC members on the stand were attired in white coats which 'gave a very smart appearance and is a point well worth noting at future shows'. The event attracted the

attention of the newspapers, and in CQTV37 appeared a cutting from the Rhodesia Herald, showing John Tanner operating the 'Television Telephone'. (It is not said how the Club obtained the African newspaper!).

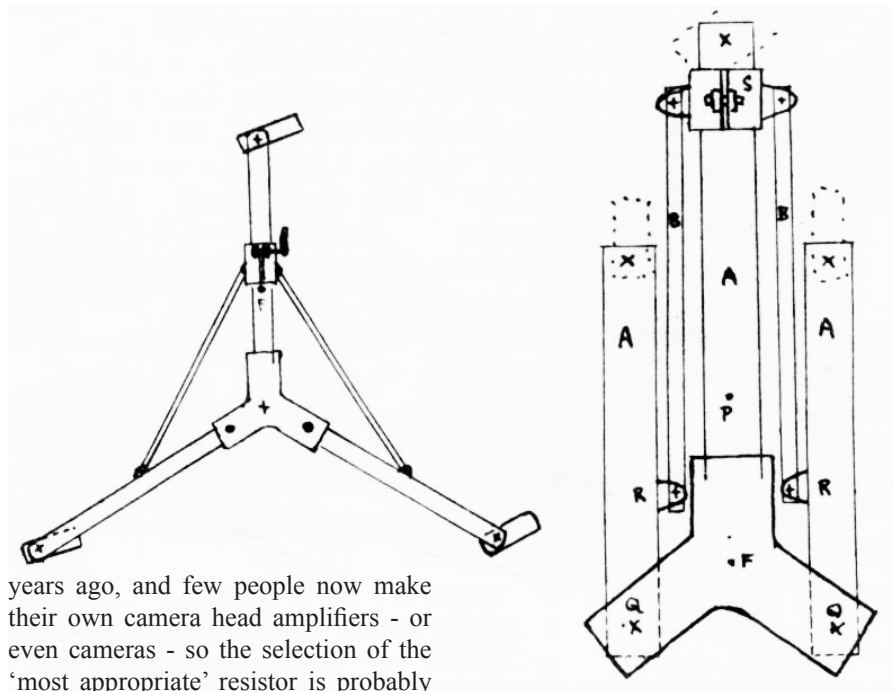
This issue of the magazine contained two articles to help members - particularly those who were going to start constructing video equipment for the first time. The first was a general article on the problems of the wide bandwidth of video circuits. (For 'younger' readers, Mc/s is MHz, and mfd is mF. Valve circuitry tended to work with higher impedances than their modern solid state equivalents. The principles of layout etc, are just as relevant now, however). "Remember that in TV circuits you are often trying to pass frequencies from DC to 5, 10 or possibly to 20 Mc/s even, that is, right up into the medium wave radio frequencies. The circuit must therefore be laid out and wired in such a way that the balance of these frequencies is not altered in any way. At zero (DC) and low frequencies, troubles arise in such things as the power supply. The reactance of the output smoothing condenser rises as the frequency decreases, causing motorboating and the like. The power supply should have at least 100 mfd across it, or better still be electronically regulated. To pass LF waveforms without tilt, coupling capacitors should, or rather must have a very high leakage resistance; mica or good quality paper ones should be used but not normal electrolytics. To maintain accurate time constants some resistors may need to be high stability. For the HF's, proceed as if designing an RF amplifier for the maximum video frequency, screen stages, decouple heaters, run heater wiring outside the chassis, decouple all stages etc. Due to the low gain per stage in video amplifiers, because of bandwidth considerations, these precautions are not always observed, but care must be taken to keep all input leads well away from all output leads. Any R-C combination is 5dB down when  $C \times R$

$= \frac{1}{2} p f$ . In a normal video amplifier, R is the anode load and C is the sum of valve capacities and strays, such as wiring strays. Thus keep the input and output leads well away from earthed objects, and keep these leads short. Keep coupling capacitors well away from the chassis and NEVER cableform video leads at high impedance. .... Take care with choice of components: inductive resistors and capacitors, capacitive coils, almost anything running even slightly warm; all conspire to upset things. SO THINK. Beware of paxolin valveholders, ceramicon capacitors with high temperature coefficients being heated by circulating RF, noisy potentiometers, pick up of broadcast programmes or hum on wiring or unscreened chassis, and interaction of valves not fitted with screening cans. Under-run high-stability resistors are less noisy than Erie type 8 in low level stages."

The second article considered the use of high stability resistors - at a time when the 'ordinary' resistors were carbon composition types. The article began by "defining noise as 'Unwanted energy (or the voltage produced) usually of random character, present in a transmission system, due to any causes'. As well as the familiar hiss from a loudspeaker this definition also includes interference spots on TV tubes, 'grass' on radar screens etc. The particular type of random noise with which we are concerned at the moment is known as thermal noise. .... At room temperature, 170C, the noise is  $V = 0.126 \sqrt{BR}$  where V mV is the RMS noise, B is the bandwidth in Mc/s and R ohms is the resistance. As the temperature increases, so does the noise. As an example, the noise from a 1M resistor measured over 1 Mc/s bandwidth amounts to 126 mV at 170C." "A typical resistor", the magazine told us, consisted "of a mixture of carbon particles, and some inert material to act as a binder. This leads to other sources of noise due to contact potentials between particles and so on. Normally this does not matter in the least when we are dealing with signals of 1 volt or more, but when the signal is



only mV, then obviously it is important to keep the noise down to preserve the signal/noise ratio at a good value. Wire wound resistors are generally better than carbon ones but as they inductive they should be used with caution in RF and video circuits. The most useful resistor is the high stability cracked carbon; this is made by depositing a uniform layer or film of carbon (soot) on to a ceramic rod, and cutting a spiral track round it to give it the required resistance. The word cracked is a chemical term, a reference to the way carbon is obtained and does not imply that the resistors are sold in a broken condition! Besides being less noisy, this type of resistor is less subject to variation in temperature, applied voltage and age as the name implies. Now, when is it worth using one or these rather expensive components? They are helpful in the first stage of a camera head amplifier, and in the first stages of other low level amplifiers. It is advisable to use high-stabs for both anode and screen loads in these cases, but cathode loads can be normal carbon types, since the cathode is a low impedance circuit." The article concluded with several references for members to 'read up' about the subject of noise. (Modern components are better than those of 50



years ago, and few people now make their own camera head amplifiers - or even cameras - so the selection of the 'most appropriate' resistor is probably decided by what the 'supplier' has in stock now-a-days.)

The magazine included the usual 'technical tips', such as dc coupling points with a high potential difference between them, an RF detector, and addressing the "problem of making a camera dolly". CQ-TV explained that "to be successful it must be rigid

and strong, and in this case it usually is bulky and heavy. The drawings show a simple collapsible dolly that can be made from Gascoigne fittings or standard conduits. 4" castors are suggested. .... Tubes A are 1 1/4" o.d. and 23" between mounting centres. Tubes B are 3/4" o.d. and 14" long; collar S can be slid along the centre member. The main casting be replaced by wood or sheet metal construction. The centre member is fixed to the main casting, but the outer legs can pivot freely. The dimensions can of course be scaled down for lighter and smaller cameras and tripods." (this was suggested as being suitable for cameras weighing 100 lbs or so).

News from ATV groups around the world included a new group starting in Dublin, a Midlands group meeting at Trenton, a SW Essex group preparing for a show in Dagenham, the Cambridge group at the local model engineers exhibition - complete with Matilda, and the Chelmsford group also preparing for a show - this one in Harlow. The Montreal group had discontinued meetings for the summer, whilst they made a film for the BATC Convention. The Yeovil group were slowly recovering from a disastrous fire at their base. (I wonder how many 'local groups' are putting on an exhibition of ATV in 2008 -- 50 years ago, it would have been a novelty for 'the public' to see a tv camera etc of any sort, of course)

**T** HIS novel device is being shown at the "Radio as a Hobby" Exhibition in London—a television-telephone, enabling a caller to actually see the speaker at the other end of the line.



## Lincolnshire Steam and Vintage Vehicle Rally 2008

by Paul Marshall

Retro television was on show on August 16/17 at the Lincolnshire Steam and Vintage Vehicle Rally held at the Lincolnshire Showground just north of Lincoln. Both of Paul Marshall's restored OB trucks, 'Southern' and 'Yorkshire-Tyne Tees' were up and running with a 'set' of 1960s and 1970s household items for the vintage cameras to look at. With wet weather destroying many such events this year the two day event was very lucky in being blessed with dry conditions and some pleasant sunshine. Even so there was heavy rain during Saturday night but that didn't matter!

'Southern' sported the usual pair of operational 1970s Marconi Mark VIIIs

along with a hosted Ikegami HV355 on a Plover pedestal to illustrate that modern cameras with big lenses aren't a lot smaller really!

'Yorkshire-Tyne Tees' ran two early 1960s Marconi MkIVs, a MkV, and a 1980s MkX. In addition a partly restored Marconi MkII, one of two 'survivors' from the Queen's 1953 Coronation was on static display.

The team of Dave Hill, Richard Harris, Paul Hundy, Sam and James Booth, Jill Marshall, and Paul Kitchen all had a busy time talking to visitors, explaining the technology and setting the whole lot up. Technically everything was highly successful with the only 'casualties' being a MkVII v/f sync separator that failed in the first hour, a MkIV line scan

board with low width (both rapidly replaced) and a Pye monitor that decided to have the odd EHT arc and spark. That's neglecting the usual badly seating boards, loose relays, plugs etc. that needed a good wobble, re-seat or a simple thump! Considering the sheer quantity of kit, all the cameras, 22 black and white 1960s Pye monitors, 8 early 1970s Barco colour monitors, two vintage vision mixers and all the ancillary equipment the reliability over the two days was excellent, especially as regular maintenance has been somewhat neglected this year! Mechanically both trucks, including the Bedford horsebox TK used as the OB tender, behaved very well and the only casualty was in the supporting Peugeot 406 which popped its radiator!



Don't "lurk" - Use the new Forum - Post a msg today!  
[http://www.batc.org.uk/club\\_stuff/forum.htm](http://www.batc.org.uk/club_stuff/forum.htm)





**OB streaming rig at Sheffield (above) and AMSAT-UK (below)**

