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## Committee Contacts

The BATC committee are available to help and advise club members on ATV related subjects. Please remember that all club work is done in spare time, so try to keep questions to a minimum. It is better to telephone rather than write (SAE essential if you write). Please do not telephone at unsociable hours, as a guide try to call between 1830 & 2130 hours and not before 1130 at weekends. Thank you.

### **BATC Chairman Trevor Brown G8CJS**

Club affairs, Video tape library, Technical queries, especially relating to handbook projects. 14 Stairfoot Close, Adel, Leeds, LS16 8JR. Tel: 01132 670115

### **BATC General Secretary Paul Marshall G8MJW**

General club correspondence and business. Library queries relating to the borrowing or donation of written material. Fern house, Church road, Harby, Notts., NG23 7ED. Tel: 01522 703348

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## **EXHIBITIONS**

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**CAT 96:-** General arrangements and information about talks to clubs, demonstrations, lectures, etc. Paul Marshall G8MJW - Details above.

## **CLUB SALES**

**MEMBERS SERVICES:-** PCB's, components, camera tubes, accessories, etc. (NOT PUBLICATIONS). Peter Delaney G8KZG, 6 East View Close, Wargrave, Berkshire, RG10 8BJ. Tel: 01734 403121

**PUBLICATIONS:-** Handbooks, Back copies CQTV, and anything related to the supply of BATC publications. Ian Pawson G8IQU, 14 Lilac avenue, Leicester, LE5 1FN. Tel: 0116 276 9425

## **MEMBERSHIP**

Anything to do with membership, including new applications, queries about new and existing membership, non-receipt of CQ-TV, subscriptions, membership records, data protection act. Dave Lawton G0ANO, 'Grenehurst', Pinewood road, High Wycombe, Bucks., HP12 4DD. Tel: 01494 528899

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## Post and News

Dear Editor

Can I draw members attention to the Television Show which this year takes place on 13, 14, 15 March at the Business Design Centre Islington London N1. It is aimed at quote Industry Professionals, but they let me in last year. There is a static display of state of the art Production equipment most of it outside the price range of us amateurs. There is also a full lecture programme but most of them are aimed at TV production tykes so unless you want to spend £25 on a Greg Dyke lecture or £35 on a Gala Party, just attend the static display it will set you back £10 and give you mental indigestion. If you are plugged into the internet you can find out more on :- [www.theframe.com\tvshow](http://www.theframe.com/tvshow) or Email [tvshow@theframe.com](mailto:tvshow@theframe.com)

Last but not least it's aimed at TV professionals so leave your Callsign badges at home.

Trevor Brown G8CJS

Dear Editor

I have been struggling with a JVC GR-C1 camcorder in that I want to use it for ATV work as a camera only and it can't understand why I have not put a tape in it. I have tried contacting JVC who have sent me some very clear instructions press button 1 (mains on\off) I would never of thought of that

2 Insert Tape

(Jeremy Beadle here I come)

3 Press record .

This puts it in camcorder record but is no help just using the camera. I have found my way around the problem by removing the tape from an old cassette and inserting this. The head revolves but does not wear on the abesent tape. If anyone has a more elegant solution I would like to here it.

Jos'e Robat ON7TP

Help. I am hoping to use my PC for SSTV work can anybody recommend suitable hard and software.

J. Francalanza, Plot 24, Housing Estate, Zejtun ZTNO 4, MALTA

Dear Editor,

Can anyone help I have a Sony seirs 5 edit suit which provide RS422 commands via a 9 pin interface. I would like to convert this signal to VCR multiway and computer input.

Dave Warner G4OER

The editor controller is sending and receiving P2 protocol data (RS422) and is designed to control professional machines which have the same socket. I suspect the VCR multiway you mention is some VHS protocol and I don't know of any converters. Some VHS machine have this protocol built in but they are expensive.  
(Editor)

A reminder from the Membership Secretary about 'Change of Address' With the mailing of the last issue of CQ-TV No. 172 I had seven magazines returned, marked " no longer at this address ". If you are about to move don't forget to let me know.

## **Subscription Renewals 1996**

Have you paid your Subscription for 1996, if not this will be the last magazine you will receive.

The Subscription rates are : 1996 only **£9.00**, 1996 + 1997 **£17.00**, 1996 + 97 + 98, **£25.00**, 96 + 97 + 98 + 99 **£31.00**      *Cheques made payable to BATC.*

Overseas Members Outside Europe who wish their magazine sent by Airmail please add 50 % to the Subscription. Airmail is not required within Europe.

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UK Cheque, British Postal Order, Eurocheque in Sterling, Bankers Cheque Drawn on a UK Bank in Sterling, Credit Card ..... ( please give details of NAME on the card, CARD NUMBER, EXPIRY DATE and full address. This address must be the mailing address of CQ-TV. )

Please send all correspondence for Post and News to the CQ-TV Editor.

## Editorial

First let me start by apologising for the late arrival of CQTV to your door mat. Chris Smith has dropped out as Editor and I am trying to fly his desk at rather short notice. I would like to thank Chris for his valiant efforts at what is a difficult job at the best of times.

I would also like to thank my XYL Pauline for her time at the keyboard typing in your copy. As soon as it hits the disc my modem is running hot pushing the result to Ian Pawson who is proof reading, spell checking, formatting and providing general life support to me. If the diagrams or format don't quite look like the usual polished result from Chris blame my lack of experience and editorial time.

Please send all your copy for the next issue to me and I will promise to either find another mug sorry volunteer or have moved further up the learning curve so Ian only needs to provide minimal life support.

While on the subject of copy CQTV is now produced on Word 6. If you drop me a disc I can let you have a readme file and template that will enable you to provide copy that would go into the magazine a little more smoothly and help you see on the screen what your copy would look like. If you do not have this level of technology we still need your input, but if I have skipped over your contribution this time its because of the lack of time. I have selected articles on an ease of processing basis but while trying to keep some sort of editorial balance between technical builds and information, across ATV SSTV and NBTV.

TREVOR BROWN CQTV 173 EDITOR

It would be of great assistance to the Editorial team if contributions to CQ-TV were in Word 6/7 format, and using the CQTV.DOT template. This is available for download from the Club's BBS on +44 (0) 1633 614765, or you can take up Trevors offer as mentioned above.

### **By Trevor Brown G8CJS**

One or two errors crept into Beyond TTL #10 in that the Editor reduced the size of the article by omitting the flow chart and reproducing the Software as an .ASM file as opposed to a .LST file the former does not have the machine code hex data. Chris also amended the text and removed references to the removed information. The problem was he printed the non amended text. If you want the flow chart or full listing then send me an S.A.E.

In this issue I am going to go back over the EPROM Programmer which appeared in CQ TV 166. The original article required an external power supply and was not supported by a PCB. I have re engineered the programmer to work without the external power supply and wafer switch, using PCB friendly DIL switches instead, and yes I have designed a PCB layout and by the time you read this I am sure I will be in possession of a reasonable supply of the aforementioned. I have reproduced the full article here with all modifications and I hope with no omissions unless you know differently Chris.

### **Hardware Interface Card**

The unit is in two parts, the first part is a small 8 bit interface card that fits inside the PC and provides a 37 way D type connector onto which the EPROM programmer interfaces via a 37 way D type lead. This programmable Interface card is available from Maplin as a kit or bare PCB, the kit is ordered as LP12N and the bare PCB is GE31J. The interface card uses the 8255 PPI and has the necessary logic and DIL switches to enable it to interface to the PC at numerous addresses. For our purposes they should be set to 300h. The kit comes with full instructions including a GW basic programme to test it with. For those of you not familiar with the 8255, it provides three parallel ports of 8 lines each. The three ports A,B, and C can be used as inputs or outputs to the PC. The direction of the lines is controlled by software. The 24 lines are available on a 37 way D connector along with the PC's 5 volt power rail. The D connector is accessible from the rear of the PC.

## Hardware EPROM Programmer

The EPROM programmer hardware connects to the 37 way D connector on the interface card and provides the capability to read ,edit, duplicate, and programme 2716, 2732, 2764, 27128, 27256 and 27512 EPROM's. Fig 1 shows the circuit diagram of the programmer hardware. The 8255 on the Maplin interface card provides 24 I/O lines which controls the data and address lines of the target EPROM, this is sufficient to control the smaller EPROM's (up to 27128) but for the larger EPROM's data multiplexing on the address bus becomes necessary. This is accomplished by loading part of the address into the 74HC374 data latch and then supplying the second part of the address direct to the EPROM. The circuit was kept as simple as possible by using DIL switches for some of the configuration between different EPROM types and pots to set the programming voltages.

The following look up table shows how to set the DIL switches to suit the different types of EPROM's.

DIL SWITCH ONE	A	B	C	D
2716	DOWN	X	UP	UP
2732	DOWN	X	DOWN	DOWN
2764\128\256	UP	DOWN	DOWN	UP
27512	UP	UP	DOWN	DOWN

**Note:** X means don't care

This is not the most elegant solution to selecting the type of EPROM but it is easy to implement and it does keep the design simple and the component count down. There are two other DIL switches on the circuit diagram, DIL 2 switches the programming voltage on and off so that EPROM's cannot accidentally be erased. DIL 3 switches the programming volts between RV1 and RV2. These two pots set the programming volts and can be set for 12.5v and 21v the most common programming voltages. Should you need to programme using one of the less common programming voltages i.e. 25v one of the pots can be reset by monitoring the voltage on pin 1 of IC2 (78S40). A 28 pin Z.I.F (Zero Insertion Force) socket should be used for the EPROM's the smaller 24 pin devices are inserted in the bottom leaving pins 1,2, 27,28 empty.



The programmer is powered from the PC's +5 volt which is available on the 37 way D connector. There are two versions of this card one with a fuse and the other (presumably an earlier version) without. They use different circuit configurations to achieve the same end. The 8255 outputs are on the same pins, and the DIL switch configuration is the same, but the +5 changes from pin 11 to 14 depending on which version you get. These are connected together on the programmer so either card will work.

The programmer has the option of using the PC's +12 in order to lift pin 28 of the EPROM to 6 volts, for programming 27512. This is an option but most 27512 EPROM's will programme with +5 volts on pin 28. This voltage increase is controlled by Q2 which is software driven. When Q2 is turned on D1 and D2 are shorted out, and the 5 volt regulator is referenced to ground and provides +5 volts. When Q2 is turned off by the software then D1 conducts and drops 0.7 of a volt because it is a silicon diode, and D2 drops 0.3 of a volt because it is a germanium diode and together they total 1 volt. The 5 volt regulator is referenced via this voltage and as such will deliver 6 volts. Unfortunately the +12v supply required to drive this part of the circuit is not available via the Interface card, and modifications are necessary. The programmer expects this +12 volts on pin 15 of the D connector and so needs routing down the 37 way connector by an additional connection on the interface card. The +12 is available on pin 9b of the edge connector of the interface card and with care it is possible to solder to the top of this connector and link it to pin 15 of the D connector without impeding the fit of the card into the PC.

On some versions the unused gold plated pins have been omitted presumably to reduce the cost and the only alternative is to pick the +12 volts on one of the disc drive power connectors and again loop it to pin 15 of the D connector. This +12 is only required for the programming of 27512, where Vcc needs elevating to 6 volts (under software control), most of the 27512's will programme without this increase in Vcc. If you do not wish to add this feature to your programmer then set link one to A - C and you can omit Q2, D1, D2, R4 and the 5 volt regulator if you so desire. If you encounter programming problems with 27512 EPROM's then these components are required and the modifications to the interface card become necessary.

The modification is then activated by setting the link one to position A - B. (Note there are only two possible settings for this link A connected to C and B left floating or A connected to B and C left floating.) The programming voltages are derived from an on board inverter which generates a supply in excess of 25v (the highest Vpp) required. This circuit is arranged around a 78S40 chip which is configured as a switch mode power supply and will elevate the +5 volt PC supply to +25 volts with sufficient power to programme the EPROM. The Vpp is set by RV1 or RV2 depending on the position of DIL 3.

The pots should be set by monitoring pin 1 of IC2 an setting them for 21v and 12v respectively. These are the most common programming voltages and reference should be made to the EPROM data sheets as to which should be used for correct programming of the device. If data is not available then try the lower voltage first.

Some EPROM's are a little non standard and require 25 volts, when programming pots will have to be reset.

## **Construction**

A single sided PCB is available for the construction of this unit and Fig 2 shows the component layout. The EPROM socket is a Z.I.F , some of the larger types may need the PCB links near the socket fitting first or putting on the track side of the PCB as space is tight near the socket. The DIL switches are mounted in sockets. The D -type connector is the in line type, the 90° type of connector will point inwards and as such is unsuitable. Because of the inevitable limitation of single sided PCB's some wire links are required. Fig 2 also shows where these are needed. The PCB was designed to exist without a case but does require some adhesive rubber feet to stop it scratching a polished surface or from shorting out if placed on the top of a metal case used by some PC's.

The connecting lead between the Programmer D connector and the PC Interface card should be the ribbon kind and kept to a maximum of three feet as we are working with parallel data. Ribbon cable D connectors are fitted using a special jig but a block of wood and a squeeze in the vice has always worked for me.

## **BATC on the Internet**

The Internet address is ...

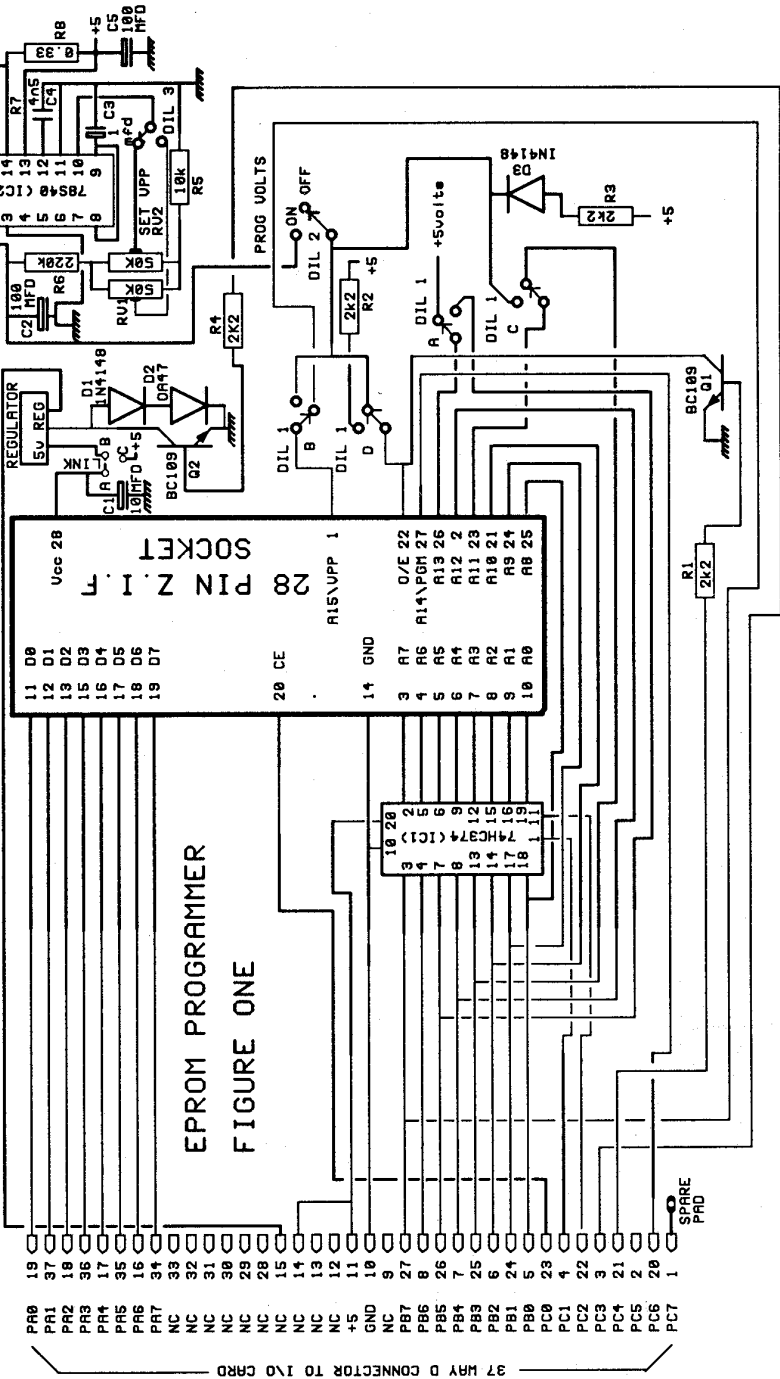
**[http://ourworld.compuserve.com/homepages/ipawson.](http://ourworld.compuserve.com/homepages/ipawson)**

You may gather from the address, the pages are being edited by our very own Publications Officer, Ian Pawson.

It is experimental at the moment, we have information on publications, sales items, who to contact, general information about the Club and latest news.

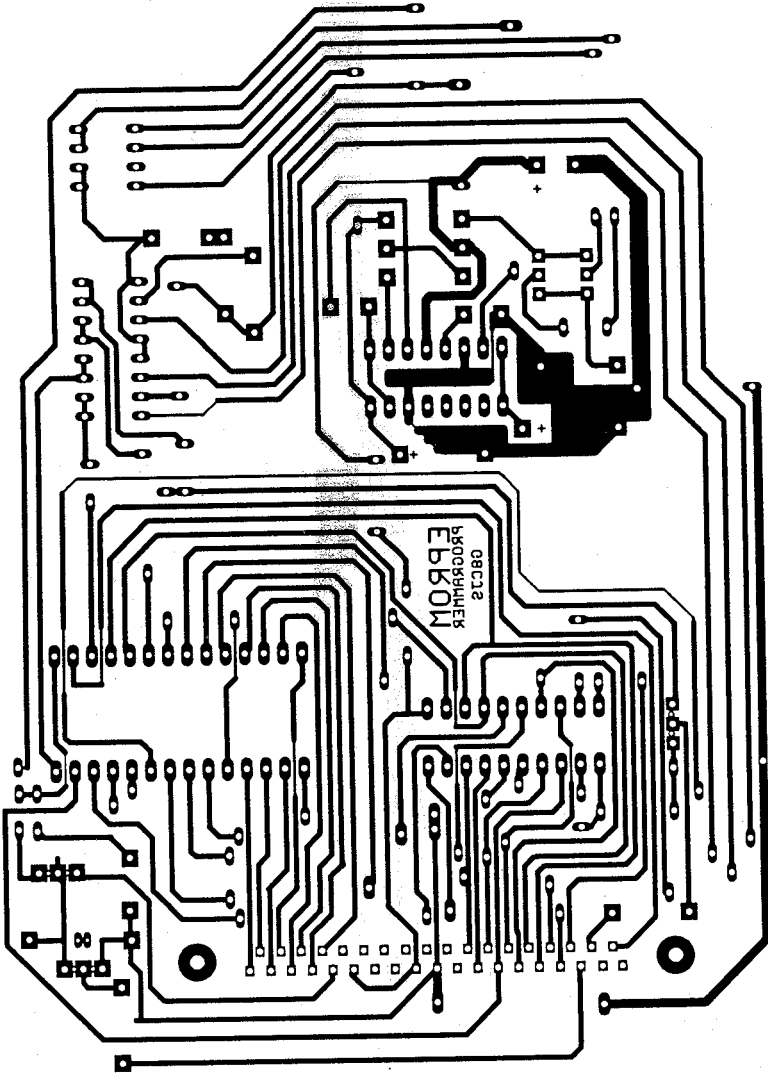
Ian would be pleased to hear any comments about the pages, you can E-mail him via a link from the BATC's homepage.

12 VOLTS SEE TEXT

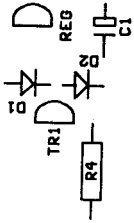


EPROM PROGRAMMER  
FIGURE ONE

37 MAY D CONNECTOR TO I/O CARD

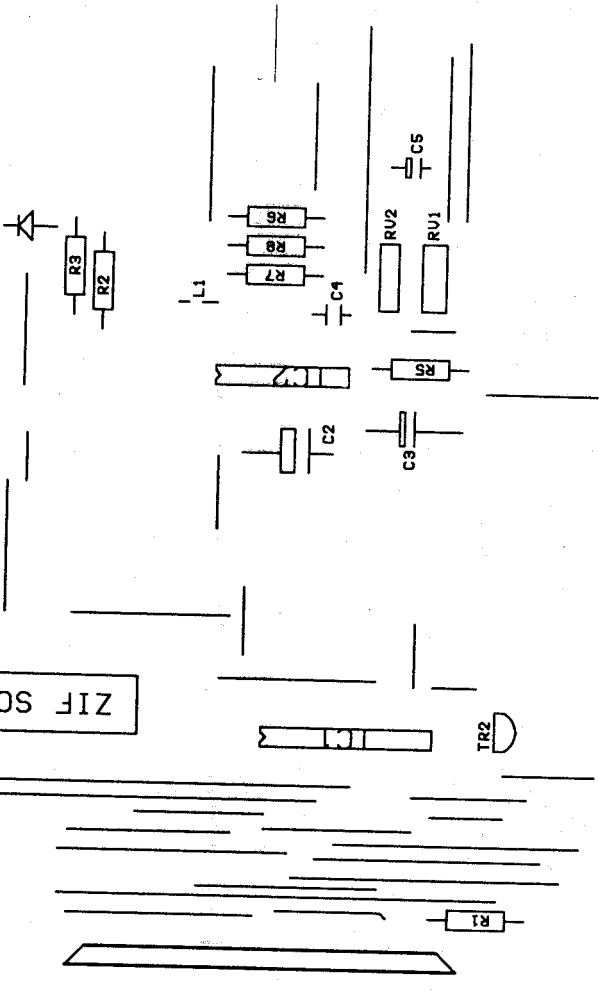


LINK  
B A C



ZIF SOCKET

A B C D  
DIL 1  
DIL 23



Take care to put them on the correct side of the ribbon, and check that pin 1 goes to pin 1 before you damage any of the hardware in particular the 8255 on the interface card as this chip will not stand any abuse. The 74HC374 deserves a special mention in that a 74C374 can also be used but not 74LS374 or 74HCT as they do not swing up to cmos logic level 1 and result in data errors when using CMOS EPROM's. Good quality sockets should be used for the IC's and DIL switches. Avoid Tantalum capacitors for C2 and C3 as these types of capacitor often have a short life in switch mode power supply applications.

The 150uH inductor is available from Maplins (see Component list) This inductor is wound on a small Toroid and can stand up, or laid down and secured in place with epoxy resin glue. RV1 and RV2 should be the multi turn pots specified as skeleton pots will not fit the PCB and would be difficult to adjust.

## Set-Up

The unit requires very little adjustment, check that the EPROM is receiving 5 volts on Vcc (pin 28) and that this elevates to 6 volts when programming 27512's, if the additional components have been fitted. RV1 and RV2 require setting for 12.5 and 21 volts. The voltage is measured at pin 1 of the 78S40 chip and DIL 3 switches between the two pots RV1 is set for the 12.5v EPROM's and RV2 for the 21v EPROM's.

Always check the manufacturers data for programming voltages as over voltage will damage the EPROM. If you are unsure try the low voltage settings first. The following table is only a guide.

2716			Vpp 25v
2732a			Vpp 21v
2764	INTEL	suffix D,P,A or A/4	Vpp 12.5
27C64	AMD	suffix 120DC to 200DC	Vpp 12.75
27C64	NATIONAL	suffix Q15 to Q25	Vpp 13V
2764	TEXAS	suffix 35JL	Vpp 12.5
27C512			Vpp 12.5v

The software is available on 3.5" disc and is DOS based consisting of a single file called EPROM.EXE and can either be run on floppy disc or copied to the hard drive. It does not have any of the fast algorithms as this programmer was intended for occasional use, so some of the larger EPROM's may take some time to programme particularly if they are full of data. It should go without saying only blank EPROM's can be programmed as the programmer will only change a logic 1 to logic 0. EPROM's require washing before programming by subjecting them to UV light. This will revert every location to logic 1 and as such all locations will read as FF in Hex

## Software

This is Menu driven and opens with the following selection of key strokes, that will take you to all the relevant parts of the programme.

- ( R ) Read EPROM to memory
- ( V ) Verify EPROM with memory
- ( B ) Blank check an EPROM

- (P) Programme EPROM with contents of memory**
- (D) Directory**
- (L) Load binary file to memory**
- (S) Save binary file to memory**
- (T) Type of EPROM**
- (C) Clear Memory buffer**
- (M) Modify memory buffer**
- (E) Exit this programme**

The menu is self explanatory and allows data to be lifted from the target EPROM edited and stored on floppy disc, recalled and programmed into other EPROM's. The modify buffer caters for both ASCII and HEX notation as per fig 3. The option T sets the memory size inside the PC, but it is also necessary to set the DIL switches on the EPROM programmer. The software as it stands, will only run on 'AT' machines, it will not run on the older 'XT' and 'PC' type machines. For those 'in the know', this is because of INT 15H (Cassette wait interrupt) is used to generate the 50mS programming pulse. It is the easiest way of ensuring that the 50mS pulse is actually 50mS on any speed computer!

```

CURRENT FILE          CURRENT EPROM 27256
ADDRESS      HEX VALUE      ASCII
0000 45 50 52 4F 4D 20 50 52 4F 47 52 41 4D 4D 45 52 EPROM PROGRAMMER
0010 42 59 20 20 20 54 52 45 56 4F 52 20 20 20 20 20 BY TREVOR
0020 20 20 20 20 20 20 42 52 4F 57 4E 20 20 20 20 20 BROWN

```

**Fig 3**

### Components

I/O Interface card	Maplin Kit LP12N
Plug 37 D Type	PCB Mount (JB31 Maplin)
28 way ZIF Socket	(FT14Q Maplin)
IC1	74HC 374
IC2	78S40 (UF37S Maplins)
RV1, RV2	50k cermet presets (UH26D Maplins)
DIL 1	XX29G Maplins
DIL 2,3	JH11M
TR1, TR2	BC109
D1,D3	1N4148
D2	OA46
L1	150 uH ( JL72p Maplins)
REG 1	78L05
R1,R2,R3,R4	2K2
R5	10k
R6	220k
R7	270 OHMS
R8	0.3 OHMS (S0R33 Maplins)
C1	10uF
C2	100uF
C3	1 uF
C4	4N5
C5	100uF

PCB and software, on 3.5" disc, Available from:- Trevor Brown 14 Stairfoot Close, Adel, Leeds, LS16 8JR

# Rally 96

Sunday April 28<sup>th</sup> 1996 at the Sports Connexion,  
Coventry.



## Future Additions

Latch IC1 has tri state outputs, controlled by pin 1, which is routed to the I/O card. As such if the A, B and upper C port of the 8255 were configured as inputs then all the data and address lines of the EPROM would be left floating. Thus enabling RAM memory inserted in the ZIF socket and programmed with Vpp turned off to be controlled by external logic in order to emulate an EPROM. The lower C port being left as an output to control the 6 volts on pin 28 and the Latch. The one omission I made was C/E which is on the lower C port not the upper and as such would need re routing and the software adjusting in order for an emulator to function. The software would also need Emulation adding to the menu as a command that would re configure the 8255 to A, B, and C upper as inputs.

To this End I have tried and almost succeeded to leaving the door open for an emulator Piggyback module. Given my present spare time allocation it may be that my bus Pass may come before the emulator, but if one of you budding engineers out there would like to take up the challenge then I would be happy not to stand in your way and put the full resource of the BATC at your disposal ( one 74 data book with pages missing and Chris Smiths secret telephone number).

I am also considering what else to explore in this column and am at the present moment considering investigating Stamp Modules. These are small micro's often built into header plugs. They can be programmed via the serial port of a PC using a simple basic language. I hope to investigate if it is possible to use one for a simple repeater logic, or any other ATV applications. If anyone has experience or data on any of these modules I would be grateful if they could contact me.

## SUBSCRIPTION RENEWALS 1996

Have you paid your Subscription for 1996? If not, this will be the last magazine you will receive.

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## By Paul Holland

They say time flies when your having fun! It hardly seems possible that 12 months have elapsed since I passed on new year greetings for 1995 and looked forward to the forthcoming year. Well here we are again, a little later than usual, a few more inches on the waistline, a lot more grey hairs and at least two more antennas at the Threapwood Teleport! This coming year, like the last, promises major changes in the Satellite TV industry. I hope to reflect them all through the pages of this column and wish you all a happy and successful 1996.

## Sign Of The Times

A glance through this edition of Satellite TV news sees the continuing trend towards the digital distribution of TV for broadcasters, cable head ends and DTH. This year will see the first substantial sale of digital decoders in Europe. TV Multiplex services will be provided by Canal Plus and Nethold on Astra 1E. The German State broadcasters ARD and ZDF will also take digital capacity on ASTRA 1E, in fact ZDF has been broadcasting an MPEG 2 feed on ASTRA 1E since the beginning of the year. B-SkyB have to date announced no digital plans. As with all new technology lead developments the first buyers of digital receivers will soon find themselves with redundant equipment (remember Betamax and BSB!!). At a Eutelsat seminar recently club member Alan Warne, G4EZO, and myself had the opportunity to get some "hands on" experience with the new PACE DVR500 MPEG 2 receiver. The driving force behind digital TV for broadcasters is subscription revenue. The DVR500 we saw was equipped with a single conditional access (CA) module with a single smart card slot. This would limit the unit to one conditional access system unless you acquired other CA modules (which can be plugged in from the rear) and of course the complementary smart cards (which plug in at the front). The unit we saw was fitted with an IRDETO CA module, no doubt intended for export to South Africa for their new DTH service via PanAmsat 4.

This approach (likely to be favoured by B-Sky-B and Canal Plus) flies in the face of the recommendations of the Digital Video Group (DVG) which recommended a single common Conditional Access system. The market will ultimately be consumer driven so for those who can resist, it may be better to wait and see what happens.

On a positive note, unencrypted MPEG 2 signals should be receivable regardless of the CA system fitted to the digital decoder. The following summary of MPEG2 digital activity on Eutelsat satellites is an indication of how far digital distribution has expanded so far;

## Eutelsat II F1 13.0 Deg E

Tp 41 12.5764 Ghz (H) Pro TV (Rumania)

Tp 45 12.542 Ghz (V) Telepiu Multiplex with Telepiu 1,2&3  
Discovery, MTV and CNN

**Eutelsat II F6 13.0 Deg E**

Tp 2 11.2355 Ghz(V) Viacom Multiplex with MTV Italy, VH1  
Germany, Sci Fi (24 hrs), MTV Europe  
and Bloomberg (financial) TV

**Eutelsat II F3 16.0 Deg E**

Tp 20 10.960625 Ghz (H) Fiat Network (Italy)  
Tp 20 11.016167 Ghz (H) Channel 1C (Netherlands)  
Tp 20 11.024167 Ghz (H) The Music Factory (Netherlands)  
Tp 21 11.080 Ghz (H) Wiszle TV (Polish)  
Tp 40 12.52141 Ghz(H) SIS Link (MPEG 1)

**Eutelsat II F4 7.0 Deg E**

Tp 27 11.134833 Ghz (V) Antenna 1 (Rumania)

**Don't forget CAT 96**  
**1<sup>st</sup> September 1996 at The Post House Hotel,**  
**Crick, near Rugby**

## From the Postbag

A slim post bag this month, hopefully due only to the Christmas post. Howard James, G3UPZ, asked how he can receive Greek programming on his Philips STU802 receiver using an 80cm antenna. There are currently two Greek language services available by satellite. These are ET1 which can be found on Eutelsat IIF2 at 10.0 Deg E (Tp 33,11.596 H) and PIK1 which is on Eutelsat IIF4 at 7.0 Deg E (Tp 22L, 11.146 H). ET1 is on a Eutelsat Widebeam full transponder providing 46dBw over most of the UK and, according to Eutelsat's own data, requires a 90cm antenna. ET1 can also be found on TDRSS-A4 at 41.0 Deg W in C Band at 3.960Ghz (H) in NTSC. PIK 1, like ET1, is also on a Eutelsat Widebeam but is in half transponder mode. Assuming 3dB less on the ground this will require a 1.3m antenna, according to Eutelsat. Both services transmit in clear PAL with audio at 6.6 Mhz.

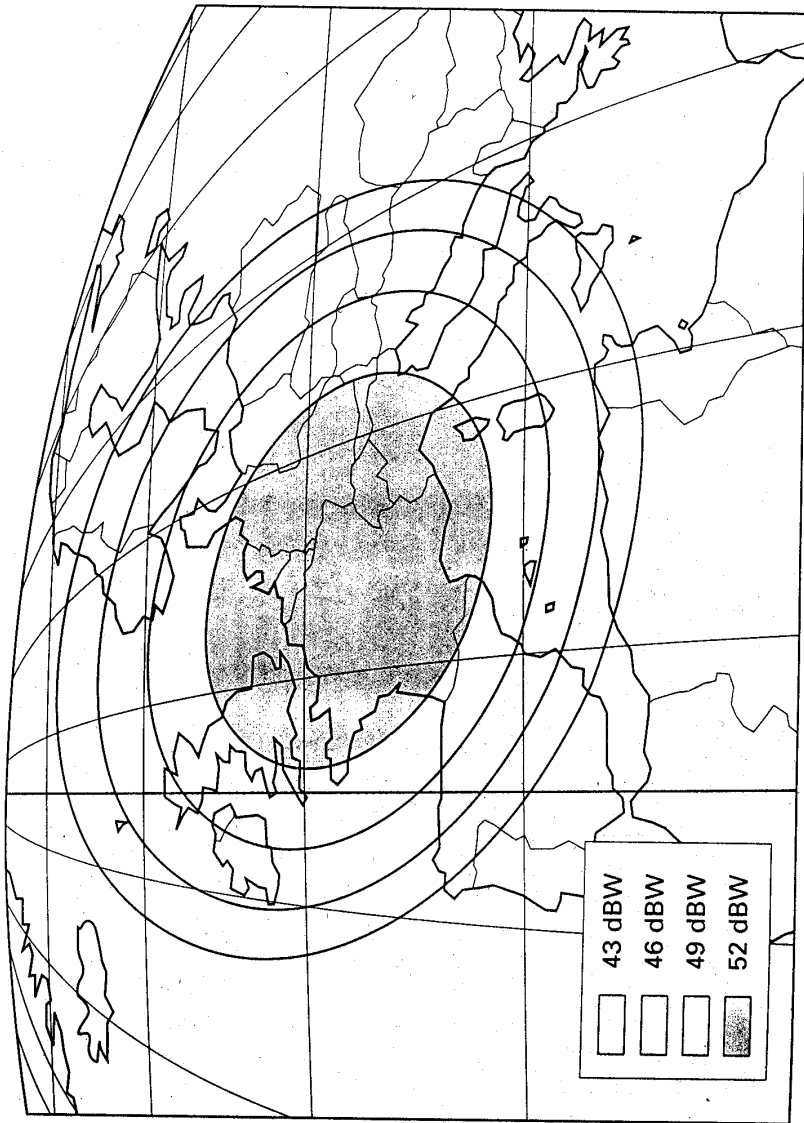
## Telecom 2C

Telecom 2C was successfully launched on 9th December aboard an Ariane 44L launch vehicle. Telecom 2C will replace Telecom 1C at 3.0 Deg E.

### Satellite Profile;

Manufacturer	Matra Marconi Space
Platform	Eurostar
Stabilisation	3 Axis
Launch weight	2,270 Kg
Electrical Power	3.5KW
Transponders	11 Ku Band (12.5 - 12.75 Ghz) 10 C Band (3.7 - 4.2 Ghz)
Power (Ku Band)	55 watt TWTA's
Power (C Band)	11 watt SSPA's
Coverage (Ku Band)	Main Zone 52.4 dBW
Adjacent Zone	49.4 dBW
Coverage (C Band)	Mainland France spot beam 32.5 dBW
Tp Bandwidth (Ku)	36 Mhz , Expected Life 10 years

**Zone de couverture de Télécom 2 à 14/12 GHz**



## New Channels From Granada

Information so far on the announcement before Christmas by Granada and B-Sky-B is that the proposed 8 channel package will include Granada Gold Plus, Talk TV, Good Life, TV Shopping, Man & Motoring, Health & Beauty, Food & Wine together with a channel called Home & Gardening. It is not clear if these channels will "time share" as analogue services or if they will form the basis of B-Sky-B's digital service. My guess is for the former with either some of the unused ASTRA 1D being brought into use or possibly spare capacity on ASTRA 1A resulting from closure of the Scandinavian D2Mac services.

## Other New Channels

**LBCI** Lebanese Broadcasting International is planning to take capacity on Arabsat from the 1st of March with uplinking facilities in Rome.

**NRK 2** The Norwegian state broadcaster NRK plans to launch NRK 2 in late August probably using capacity on Intelsat 707A at 1.0 Deg W (see Transponder News below)

**Hyperkids** The French broadcaster TF1 plan to launch a children's channel called Hyperkids about now on Eutelsat IIF1.

**Hallmark Channel.** This American owned general entertainment channel is looking to launch a UK service early this year. Already carried on Benelux cable networks it is not clear whether the channel will be delivered via an analogue or digital feed.

**RAI International** Italian broadcaster RAI has announced plans to re-launch an international service via satellite for Europe, Australia and N & South America (some will remember the former RAI SAT on Olympus). The service is planned to come into operation some time this year.

**TV EROTICA** This channel was looking as if it was going the way of Red Hot TV as we closed for press with Eutelsat claiming that transponder fees were unpaid and the channel failing to appear at published times.

## New Satellites

Telenor, the Norwegian operator of the Thor satellite at 0.8 Deg W have ordered a new satellite to be called Thor 2A from a consortium led by Hughes Space & Communications International. The new satellite will carry 15 transponders for both analogue and digital use and will locate at 0.8 Deg W from the early part of 1997.

The Orion Satellite Corporation has been granted authorisation to locate its second satellite, Orion 2, at 12.0 Deg W. With a coverage area spanning Europe, the Middle East as well as both N & S America the satellite will have 32 Ku Band transponders. No launch date has yet been announced.

ARABSAT 2A will launch in July this year and will locate at 26.0 Deg E to be followed by ARABSAT 2B in May 1997 locating at 30.5 Deg E. Both of these

high power second generation Aerospatiale Satellites will carry 12 Ku and 22 C Band transponders.

Turksat 1C will launch in June this year and will be located at 42.0 Deg E.

## **Intelsat News**

Intelsat have registered 31.5 Deg W and 18.0 Deg W for the location of Intelsat VI satellites. Intelsat have confirmed that Intelsat 805 will launch in March 1998 aboard a Chinese Long March 3 rocket. Positioned at 33.5 Deg the satellite will target Africa and India.

## **Eutelsat News**

Eutelsat have signed with Arianespace for the launch of three satellites including HOT BIRD 4 which will be co-located at 13.0 Deg E with Hot Bird 1.

Eutelsat have released further details of their new Series III satellites which will replace Eutelsat II series satellites. Displaced Series II satellites will subsequently be re-located to existing Eutelsat locations at 21.5 Deg E, 25.5 Deg E and 36.0 Deg east. Planned changes are as follows;

- Eutelsat IIF4 7.0 Deg E to be replaced by Eutelsat IIIF1 in March 1998.
- Eutelsat 11F2 10.0 Deg E to be replaced by Eutelsat IIIF2 in September 1998.
- Eutelsat IIF3 16.0 Deg E to be replaced by Eutelsat IIIF3 in April 1999.
- Eutelsat I F1 48.0 Deg E to be replaced by Eutelsat SEASAT in May 1998 and taken out of service.

The launches will start with HOT BIRD 2 in the second half of this year and will utilise either an Arianespace 4 or 5 launch vehicle, HOT BIRD 3 will launch in the first quarter of 1997.

Eutelsat have also announced that from 2000 they will expand their current HOT BIRD slot at 13.0 Deg E to include 7.0 Deg E. This slot has been selected to provide a 6.0 Deg spacing for dual feed antenna's but will almost certainly be dependant on the successful take up of digital capacity on HOT BIRDS 2 - 4.

## **Transponder News**

### **GALS 1/2 71.0 Deg E**

Test transmissions in Ku Band have been observed from these co-positioned satellites in recent weeks. These satellites have a spot beam centre EIRP of 57.0dBW. Check out the following frequency ranges using either RHC or LHC polarisation;

Tp 1 12.149 - 12.284 Ghz

Tp 2 11.919 - 12.054 Ghz

Tp 3 11.727 - 11.900 Ghz

Kazakhstan TV is on 11.766 Ghz (RHC) and HTB is on 12.207 Ghz with good signal strength reported. Digital feeds can be found on 11.840 and 11.919 Ghz.

## **DFS 1 KOPERNIKUS 33.5 Deg E.**

The DBT lost control of DFS1 in early December with the spacecraft drifting away from its position at 33.5 Deg E. The German Research Institute has now confirmed DFS1 as being in "free orbit" and by late January had drifted to a position about 90.0 Deg E. With DFS1 out of station keeping fuel it has now been officially abandoned by the DBT.

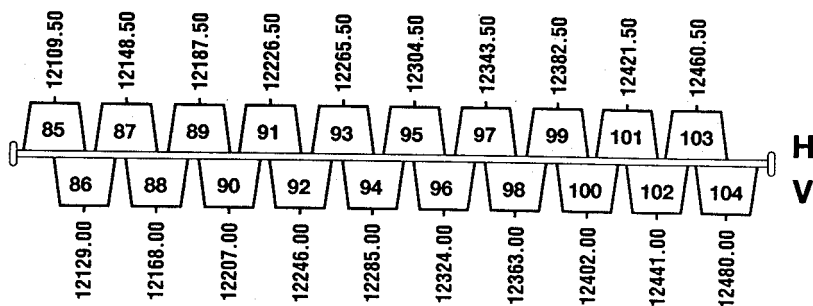
## **ASTRA 1A, 1B, 1C, 1D, 1E 19.2 Deg E**

TV3 Denmark should now have closed on Tp 27 11.612 (H) and can now only be found on Intelsat 702 Tp 75 11.473 Ghz (V). At the time of writing Tp 27 was to be re-allocated to a Scandinavian Shopping Channel. Home Order Television (HOT TV) has now taken up residence on Astra 1D Tp 62, 10.906 GHz (V). Filmnets' holding company NETHOLD launched their digital package on ASTRA 1E in January. The service includes; FilmNet Plus, Super Sport, Hallmark Entertainment Network, Discovery, TCC, CMT plus a Near Video On Demand (NVOD) film service. A frequency plan for ASTRA 1E and I F is reproduced below.



# ASTRA 1F

F-Band 12100 MHz - 12500 MHz



## Eutelsat II F3 16.0 Deg E.

The Rumanian State Broadcaster TVR has launched its international service TRVi on Tp 37 11.575 Ghz (V) in clear PAL. The channel is on air from between 19.30 to 23.00. A new Thai language service started testing before Christmas called Thaiwave on Tp 22 11.163 Ghz (H) in clear PAL. The service is apparently intending to transmit using Syster/Nagravision encryption for 5 hrs per day weekdays and 9hrs at weekends. Bosnia's RTV Bosnei Hercegovine started testing on Tp 21 in clear PAL at 11.080 Ghz (H) in late January. Audio is at 7.02 Mhz. No start date has yet been announced. The French general entertainment channel AB1 on 12.521 Ghz (H) look likely to change over to an MPEG 2 feed at the beginning of May and will expand to a 6 channel multiplex for cable networks.

## Eutelsat II F1

A new French general entertainment service called AB1 has launched for French Cable Networks on Tp 40 12.521 Ghz (H) in clear PAL. These analogue transmissions are due to cease mid year in favour of an MPEG 2 feed. Kabel 1 will close on Tp 21L and is to be replaced, according to Eutelsat, by another as yet unnamed analogue TV service. For those who had been holding their breath for Onyx TV (formerly COM TV) you should have been able to breath out during January with the official launch planned for 6 January on Tp 22L 11.146 GHz (H).

This German Music channel has had more false starts than my old Morris Traveller, we await with interest! Digital MPEG 2 transmissions for Italy's Telepiu can be found on Tp 45 12.542 Ghz (V). The pre commercial launch multiplex service is currently testing with the terrestrial Telepiu 1, 2 & 3 channels using NTL equipment. TV Eurotica has moved from Tp 22L 11.146 Ghz (H) to Tp 34 L 11.638 GHz (H) and is likely to drop its dual Videocrypt I/II encryption in favour of the European Videocrypt II variant.

### **Eutelsat II F6 13.0 Deg E.**

RAI TRE launched in early February in clear PAL (with occasional encryption in Discret) on Tp 16 11.530 Ghz (V). RTL 7 A new Polish language service called RTL 7 looks set to take Tp 14 11.492 Ghz (V) in the very near future.

### **Eutelsat II F2 10.0 Deg E.**

Satisfaction Club Television now renamed as Jessica Rizzo Television (JRT) uses Tp 37 11.575 Ghz (V). Broadcasts commence at 12.0pm on Friday & Saturday evenings in clear PAL and then encrypt in Nokia LS256.

### **SIRIUS (Formerly Marco Polo 1) 5.2 Deg E**

Changes announced before Christmas are as follows;

TV6 Sweden replacing FilmMax on Tp16 12.015 Ghz (RHC) in D2Mac.

ZTV replacing TV6 Sweden on Tp 8 11.861 Ghz (RHC) in D2Mac.

Kinnevik Sports replacing ZTV on Tp 20 12.092 Ghz (RHC) in D2Mac.

TV3 Sweden on Tp 4 11.785 GHz (RHC) to changeover to D2Mac.

All these changes were to be completed by 31st January 1996.

### **Tele X 5.0 Deg E.**

SVT 1 and SVT 2 should have changed over to a digital MPEG2 feed by now.

The digital feed will take SVT2's Tp 32 12.322 Ghz (LHC) and will include SVT1, SVT2, DR TV(Denmark) and TV2 Denmark.

### **Telecom 1C & 2C 3.0 Deg E**

This month should see the transfer of services from Telecom 1C to Telecom 2C. It is not clear yet whether Telecom 1C will be placed in an inclined orbit or which position it will move to. The frequency allocations for Telecom 2C are as follows;

<b>Tp</b>	<b>Freq (Ghz)</b>	<b>Pol</b>	<b>Service</b>	<b>Standard</b>
R1	12.522	V	Digital Business TV	MPEG 2
R2	12.564	V	Digital Business TV	MPEG 2
R3	12.606	V	OCC feeds	
R4	12.648	V	OCC feeds	
R5	12.690	V	RTL-TVi	Secam/Smartcrypt
R6	12.732	V	TV	MPEG 2
R7	12.543	H	TV Multiplex	MPEG 2 (DVB)
R8	12.585	H	TV Multiplex	MPEG 2 (DVB)
R9	12.627	H	Cine Cinefil (4:3)	D2Mac/Eurocrypt
R10	12.669	H	Cine Cinemas (4:3)	D2Mac/Eurocrypt
R11	12.711	H	Radio Multiplex	Digital

### **TV SAT 0.6 Deg W**

Following well publicised stability problems and total transponder failure late last year, Telenor, the operator of TV SAT has still not re-activated Tp 2 11.747 Ghz (LHC) and TP 6 11.823 GHz (LHC).

### **Intelsat 702 1 Deg W.**

This month should see the launch of Intelsat 707A which will replace Intelsat 702 at this position. Intelsat 702 will move in the Spring to 18.5 Deg W where it will carry the Middle East broadcaster Orbit's digital package for Europe and North Africa. This package is currently only available from Intelsat 704 at 66.0 Deg E. Intelsat 707A has two additional Ku Tp's and will expand the current range of channels to Scandinavia. NRK1 on Tp 63U 11.174 Ghz (H) will encrypt from 1st September in Eurocrypt to co-incide with the launch of NRK2, also encrypted in Eurocrypt.

## Telecom 2B 5.0 Deg W.

With the arrival of Telecom 2C at 3.0 Deg E France Telecom have announced the following revised frequency plan for Telecom 2B.

<b>Tp</b>	<b>Freq (Ghz)</b>	<b>Pol</b>	<b>Service</b>	<b>Standard</b>
R1	12.522	V	M6	Secam
R2	12.564	V	France 2	Secam
R3	12.606	V	La Cinquieme ARTE	Secam
R4	12.648	V	La Chaîne Meteo TMC	Secam/Syster
R5	12.690	V	TF1	Secam
R6	12.732	V	Reserved	
R7	12.543	H	RTL 9	Secam/Smartcrypt
R8	12.585	H	La Chaîne Info	Secam/Syster
R9	12.627	H	Occ Use	Analogue/Digital
R10	12.669	H	Occ Use	Analogue/Digital
R11	12.711	H	Occ Use	Analogue/Digital

## Stat 4/ Gorizont 15/ Express 2 14 Deg W.

A Russian private channel called BaNHax has been observed testing in C Band at 3.975 GHz (RHC).

## Intelsat 601 27.5 Deg W

Nordic variants of TCC and the Discovery channel are now being distributed to Scandinavian cable nets on 11.057 GHz (H) in clear PAL.

## Hispasat 1A & 1B 31.0 Deg W

The Spanish Broadcaster Antenna 3 was due to have launched a 5 channel digital service at this location in January. The package will include Cine Colour, Cine de Siembre, Canal Fiesta and Tele Noticias. As the channels will be supported by advertising it is likely that they will be carried in unencrypted MPEG2.

## **Orion F1 37.5 Deg W**

The UK cable service Channel One will use this satellite for its MPEG 2 feed to cable head ends from this month.

## **Intelsat 705 50.0 Deg W**

Following the launch of Intelsat II-A-2, which will be located at this position, Intelsat 705 will re-locate to 57.0 Deg E

## **Product News**

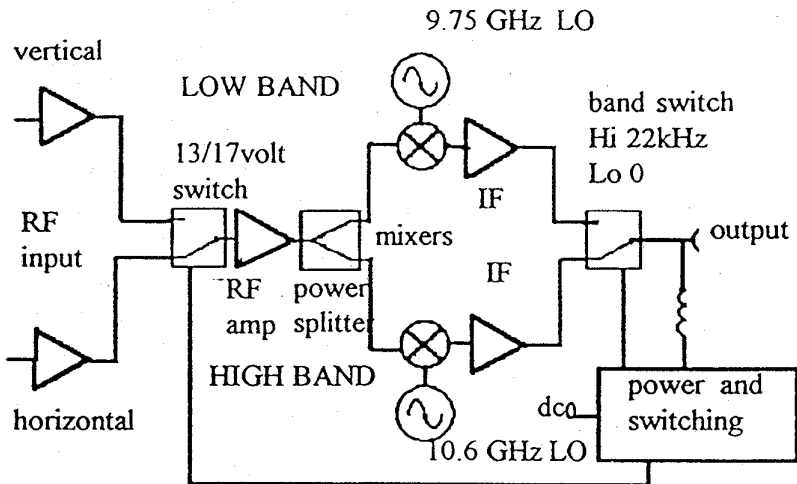
### **B MAC Decoders**

Supply of these decoders in the UK has been limited to professional and commercial users. Decoders are specific to a particular service (such as the SIS Horse Racing Service) and have their own unique ID. They can be enabled (and disabled) by the broadcaster. A supply of decoders for the American Forces Network (Europe) have been surfacing in the last few months. If you are interested try a call to 0385 395758, but as always - caveat emptor!

### **Universal LNB's**

For those readers seeing references to "Universal" LNB's for the first time, the schematic below may help to clarify exactly what they are. For many years now we have been used to "triple band" LNB's which are voltage switchable between different frequency bands (typically between FSS and Telecom bands). The use of voltage switching between polarities for most basic ASTRA receivers has led to the introduction of LNB's which switch between bands by the use of a 22 kHz tone passed over the antenna feed cable from the receiver. The term "Universal" is being applied to LNB's which not only use this 22kHz switching technique but also are deemed to be "digital ready". In the case of the Continental Microwave device illustrated below this implies a phase noise performance which meets requirements for DTH compressed digital TV distribution. The need for LNB's with an enhanced Phase Noise performance over those available so far is being disputed by some. Only time will tell if existing LNB's capable of covering a similar frequency range to the new Universal LNB's will operate satisfactorily. Characteristics of the UA Series Continental Microwave LNB are as follows;

CHARACTERISTIC	Performance
Input Frequency : Low Band	10.7 - 11.7 Ghz
High Band	11.7 - 12.75 Ghz
LO Frequency : Low Band	9.75 Ghz +/- 1 Mhz @ 20 Deg C
High Band	10.6 Ghz +/- 1Mhz @ 20 Deg C
Output Frequency : Low Band	950 Mhz - 1950 Mhz
High Band	1100 - 2150 Mhz
Polarity : Vertical	11.5 - 14.0 V
Horizontal	16.0 - 19.0 V
Conversion Gain	min 45.0 dB / 60 dB max
Noise Figure : Low Band	1.2 dB typ / 1.5 dB max
High Band	1.0 dB typ / 1.3 dB max
Cross polar rejection	min 20.0 dB
LO phase noise	- 50 dBc/Hz @ 1kHz
	- 75 dBc/Hz @ 10kHz
	- 95 dBc/Hz @ 100 kHz
VSWR	2.5:1
Current	200 mA
High Band Selection	Continuous 22kHz tone +/- 4.0 kHz



## Conclusion

That's it for another edition of "Satellite TV News". As always please do write and let me know about anything that may be of interest to you or other club members with regard to Satellite TV. In the next edition we will be looking forward to Cable & Satellite 96, which takes place at Olympia in April, and report on the latest news and events in the Satellite TV world.

**John Lawrence GW3JGA**

### **New Catalogue From Farnell**

Farnell Components has just released Issue No.1 of 'The Semiconductor Catalogue' which will be released each January and June to supplement the full traditional catalogue which comes out in April and October. The Semiconductor catalogue contains details of the latest devices and product developments. Included is a small booklet 'Semiconductor Applications Directory' sponsored by National Semiconductor and Harris Semiconductor.

### **Video Sync Stripper**

A circuit of possible ATV interest uses the Harris HFA11031P device in a high speed sync stripper circuit, shown in Fig.1. To quote the booklet - 'The HFA11031P is a wideband fast settling current feedback amp with a modified output stage to enable sync strip from a component video signal. The application circuit is shown configured for a typical video cable driver driving a double terminated 75R load, and the HFA11031P ensures unity gain throughout with it set at a gain of +2. The circuit transmit 200MHz video signals while stripping off the sync pulse and performing DC restoration'. Further details from Farnell.

Farnell Components, Canal Road, Leeds LS12 2TU. Sales Tel. 0113 263 6311 Fax. 0113 263 3411. Credit Card orders accepted, minimum order £5, no carriage.

### **Connector losses**

Recently Myles GW4RCE and Barry GW8FEY ( part of the GB3TM team)were struggling to set up a five pole interdigital bandpass filter for 24 cms, but in spite of all efforts the through-loss remained unacceptably high. Two low-cost chromium plated N-BNC adaptors were in circuit and these turned out to be the cause of the problem. Each adaptor caused a loss of 0.9dB and replacement of these with professional quality silver plated types reduced the overall loss, including the filter, to less than a dB. The moral - at 1250 MHz and higher only the very best will do.

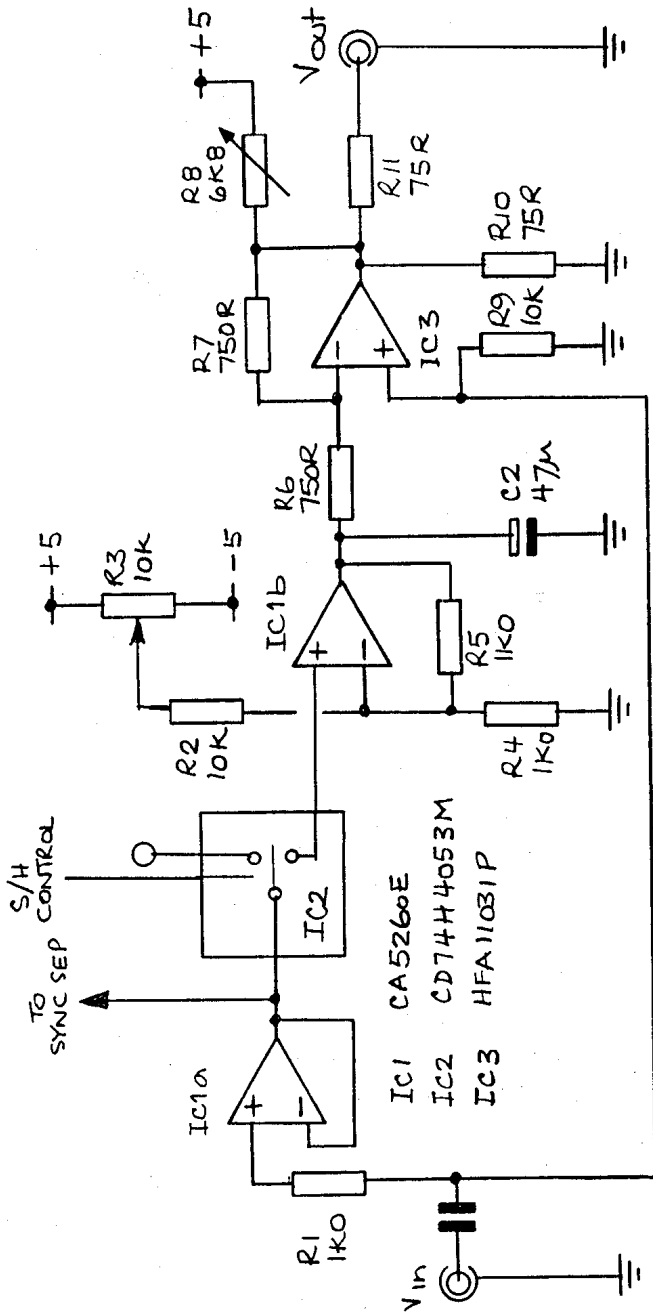


FIG. 1.



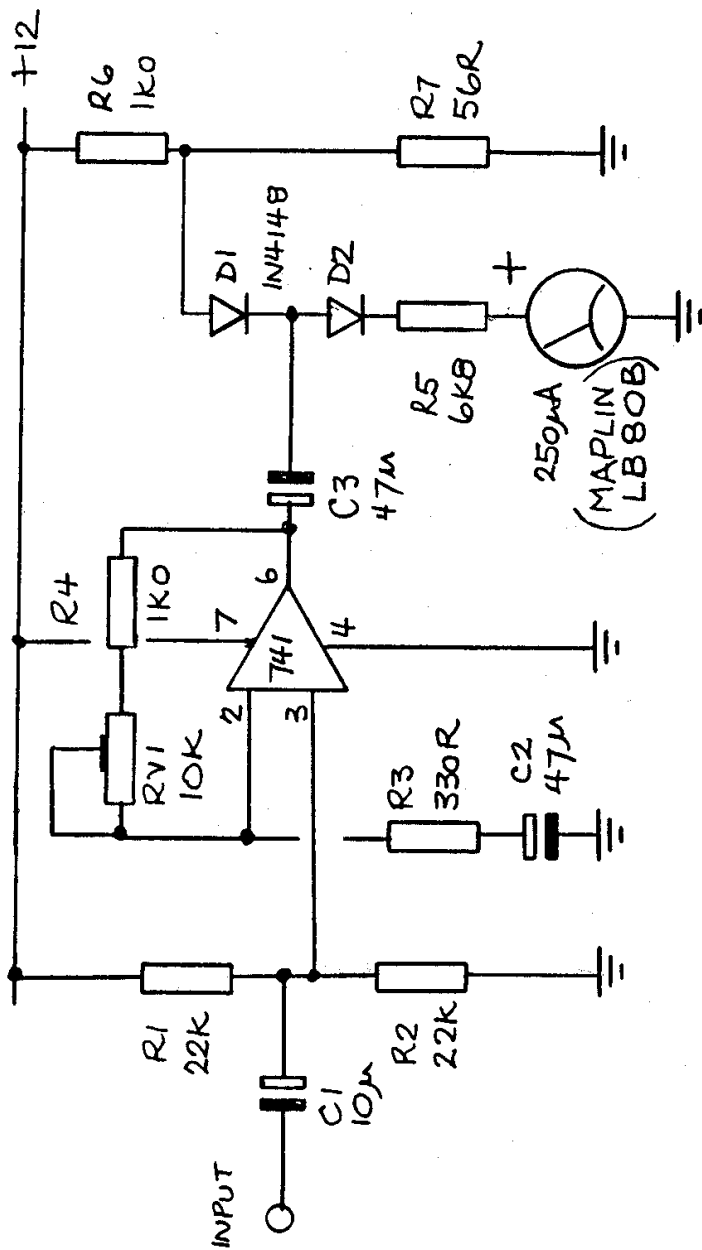


FIG. 2

## Audio level meter

If you have a number of ATV programme sources in the shack, e.g. Camcorder with built in mic, video recorder/player, caption generator with tone ident, then it is likely that all the video feeds are 1V p-p into 75R - but not so the audio. Each audio feed may be different, anything from mic level (about 1mV rms) to line level (100mV - 1V rms).

One solution is to use a VOGAD circuit using the Plessey IC SL6270P which will provide a constant 90 mV rms audio level output over a 50dB range of input signal level, from about 1mV to over 300 mV.

Alternatively a simple audio mixer could be assembled or purchased, Maplin offer some input and fader modules. In any case, the audio level to the TX needs monitoring. A simple VU meter circuit is shown in Fig.2. It provides fast attack and slow decay and uses a low cost 250uA signal strength meter (Maplin LB80B) or one of the plastic cased mono VU meters seen at Rallies.

The circuit may seem a little strange but it allows one end of the meter to be at 0V - so you could switch the '+' end to measure other things, e.g. to check the supply volts etc. The sensitivity can be adjusted by RV1 to suit the audio input requirements of the TX.

# BATC Contest Calendar 1996

## **Spring Vision 96**

Saturday 9th / Sunday 10th March 1996

## **May Microwave 96**

Saturday 11th / Sunday 12th May 1996

## **Summer Fun 96**

Saturday 8th / Sunday 9th June 1996

## **The IARU International 96**

Saturday 14th / Sunday 15th September 1996

## **Autumn Vision 96**

Saturday 9th / Sunday 10th November 1996

## **Please Note**

All contests start at 1800 hrs UTC on the Saturday and finish at 1200 hrs UTC on the Sunday. All logs have to be postmarked by the third Monday after the contest finished. Combined log/cover sheets are available from the contest manager.

## **Contest Report By Richard Guttridge**

This is the report and results for the UK only. The International results haven't appeared yet. The International only just became an international contest with one QSO to Holland and two into Wales. Conditions were very average. The G7ATV/P group did well on 24 cm and 3 cm with wins. Clive (G8EQZ) won on 70 cm with some moderate DX. The G7ATV entry proved that when conditions are flat a good following of local stations is a great help in getting a good score. Clive and I could not compete with the delights of the Lincoln Rally 50 miles or so to the south of us on the Sunday, which saw most of the locals heading that way.

Early Sunday morning was one of those days when you were glad to be alive. The mist was just wisps in the Vale of York as the sun started to burn it off. It was very still and suddenly the haze was parted by several hot air balloons which rose majestically into the air and passed about a mile to the south of us, a great sight. Now back to earth with a bump. As most of you can't have failed to notice, the number of entries to most of the contests is a joke. I have taken THE WINTER VISION CONTEST out of the contest calendar for lack of entries over a number of years. I'll do the same with the SPRING VISION and most other ATV CONTESTS if there isn't a rapid increase in the level of entries in 1996. I can see the number of contests being reduced to just two if there is no improvement. The international and one other and concentrate all our efforts into them, what do you think, if you can be

bothered? How about making the contest void if there are not enough entries, say six?  
Please let me have your views

## Contest Results

International 95, Uk Results

### 70cm TX

Place	Callsign	Points	QSOs	Best DX @ Km
1	G8EQZ/P	3050	9	PE1LZZ 416
2	G7ATV/P	2541	12	G8EQZ/P 323
3	G8MNY	1355	7	G8EQZ/P 291
4	G8GKQ	128	1	G8MNY 64

### 24cm TX

Place	Callsign	Points	QSOs	Best DX @ Km
1	G7ATV/P	1142	15	G1GST 143
2	G8EQZ/P	853	6	G3UVR 174
3	G8MNY	110	3	G4HTZ 52

### 3cm TX

Place	Callsign	Points	QSOs	Best DX @ Km
1	G7ATV/P	406	6	GW8AGI/P GW7JZP/P 63

Blank log/cover sheets FOC from :- Richard Guttridge G4YTV, Ivy House, Rise Road, Skirlaugh, Hull. HU11 5BH. tel:- 01964-562498

### Graham Shirville G3VZV

#### 70cms

Firstly may I thank all the many members who wrote to the RSGB as a result of our paper last year concerning the possible loss of large parts of the 70cms band as a result of the DSI-2 review. The RSGB has reported that by far the largest input they received was from BATC members! The insert also alerted a number of our European members to lobby their own National Societies.

No hard news as to the final outcome but the RSGB have reported that the DTI/RA has stated that they will be supporting the present amateur allocation in their DSI discussions. We are not sure whether the official bodies from other European countries are adopting the same position but there seems to be quiet confidence.

What is certain that is that if we win this battle there will no doubt be more to fight in the near future as the pressure on UHF frequencies will continue.

Full details of any experiments being done with "DATV" Digital Amateur Television which produces good pictures/sound in reduced bandwidths would be very valuable to show that we are committing time/trouble to be good neighbours.

#### 23cms

The main problem here relates to the sharing of the 1300-1325Mhz part of the band with CAA radars. Although we have cohabited for over ten years a couple of recent problems have resulted in the CAA/NATS becoming concerned.

The RSGB Licensing Advisory Committee met NATS in the middle of last year in an effort to resolve a method by which new ATV repeater applications could be proven to be safe with regard to interference to radars. Unfortunately due to a number of changes taking place within the NATS organisation and the other LAC responsibilities (DSI-2 and code free licensing) little further progress has been possible up to now.

We have four applications presently in the system, 'AT-Southampton/KT-East Kent/VX-Sussex/AF-Tyne&Wear. It is hoped that these applications can be resubmitted for clearance "real soon now". It maybe that the output frequencies will not be on one of the existing channels but might have to be hand picked to miss the frequencies used by radars in the vicinity. It may also be necessary for some units to use lower sound sub-carrier frequencies to reduce the overall signal bandwidth.

GB3HV in High Wycombe already uses a specially selected output frequency of 1308MHz. This was adopted to remove the possibility of problems with the radar at Heathrow which has one of it's channels near the top of our band. Whilst this is being achieved the relative nearness of 1308MHz to the narrow band section of 1296MHz is proving difficult for nearby narrowband operators. This is not the place for a long technical discussion about receiver overloading, channel bandwidths etc but with a 6mHz sound sub carrier the signal at 1296MHz is approx 60-70db down on the main

carrier. If the narrow band station has sensitive equipment and lives nearby this nanowatt signal will be detectable.

It is hoped that the constructive approach of the HCATV Club working with the RSGB Microwave Committee and Repeater Management Group will provide an early resolution.

I think it is fairly certain that it is unlikely that further applications would be accepted for 1308MHz outputs unless the group accepted a unique and restrictive specification!

## **10GHz**

Here is the only certain bad news! Contrary to previous reports/rumours it does appear definite that UK amateurs will lose 10150-10300MHz to local loop phone and data public network providers. This is the very area has been allocated to and is in use by our three 10GHz ATV repeaters.

The date when we will lose access to these frequencies is unclear. I have heard maybe two years, but if there is commercial pressure to start a system on these frequencies then it could be quicker.

Discussions will be held with the RSGB Microwave Committee and RMG before Easter to clarify the future band planning for 10GHz but there is absolutely no suggestion that this change will result in ATV being kicked off this band!

**70cms - Use it or Lose it!!**

# **RALLY 96**

**Sunday April 28<sup>th</sup>**  
**The Sports**  
**Connexion Coventry**

All the usual features of the BATC Rally: lost of traders, large outdoor flea market, specialist mode television displays, ex broadcast vehicles etc.

All enquires: Mike G6IQM  
Tel: 01788 890365 Fax: 01788 891883  
Email: [vhf-comm@g6iqm.demon.co.uk](mailto:vhf-comm@g6iqm.demon.co.uk)

# CQ-TV Index Supplement

## ***Introduction***

The following pages list the major articles that have appeared in CQ-TV from issue 169 through to issue 172. This is the usual update supplement that we publish between the 2 yearly complete index.

This index is in two sections. The first lists articles by categories and the second lists articles alphabetically by issue.

The index contains some abbreviations, and these are explained below.

The stock of some back issues of CQ-TV is small and variable, so please check in the current issue CQ-TV of for their availability. When stocks of a particular issue fall below 10, it is removed from the list published in CQ-TV, thus there may be odd back issues still available.

Please check with the Publications department on the availability of any back issue of CQ-TV that you may require. All enquiries should include a stamped, self addressed envelope.

## ***Abbreviations used.***

**PAGE** - is the CQ-TV page number, and **PHOTO** is the number of photo copy sheets required for that article. The cost is on a sliding scale dependant on the number of copies ordered. Please see the current issue of CQ-TV for the current prices.

Articles marked [\*xxx] indicate that a correction or update to that article has been published in the "In Retrospect" column, or in a later article, in issue number xxx.



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## A Phase Locked ASC. Generator

### Bob Platts G8OZP

This unit was designed to replace the existing 6 MHz audio sub carrier generator fitted to GB3XT, as the original no longer complied with the new repeater specification issued some time ago. It should be possible to use it in place of any existing ASC. generator. It could also be adapted for other frequencies by changing the Xtal and C17 which controls the resonant frequency of the VCO coil L1 and changing FL1 for the new required frequency.

As well as providing a very stable signal the unit incorporates audio limiting, basic optional pre-emphasis and a to provide audio roll off. The RF output is filtered to significantly reduce harmonics. The output level is adjustable.

IC1a forms the mic amp, limiter and also provides optional pre-emph. If line input is required increase the value of R1 to about 150K. If limiting is not required delete D1/D2. Link C3 to 0v to provide pre-emphasis (HF lift). IC1b/c forms a low pass filter 4th order filter (Butterworth) to provide the required -20db at 15KHz with respect to 1KHz (with pre-emph off) as required by the specification. IC1d has a gain of X3 to give the required deviation of the signal.

IC4 forms the reference oscillator and divider. L2 adjusts the frequency of the Xtal. IC2 forms a 6MHz VCO. the frequency of which is controlled by L1, its associated capacitors and the voltage applied to CD1. IC3 compares the phase of the two oscillators and produces an error signal at pin 13. This is filtered by the simple loop filter R22/23 and C19 and the resulting voltage fed to the Varicap CD1 to keep the oscillator on frequency. Audio from IC1d is also fed to CD1 to FM. modulate the signal.

When the two oscillator frequencies are in phase, a signal from IC3 pin 1 turns on Q2 illuminating LED1 indicating frequency lock. An opto isolator could be used here for remote monitoring if required. The buffered 6MHz signal from pin 9 of IC2 is fed to the emitter follower Q1 through the ceramic filter FL1 and onto the output level control VR2.

Construction could be on the PCB. layout as shown. For those who do not have PCB. making facilities vero board could be used though this has not been tried by the author. If there is sufficient demand PCB's could be made available from members services.



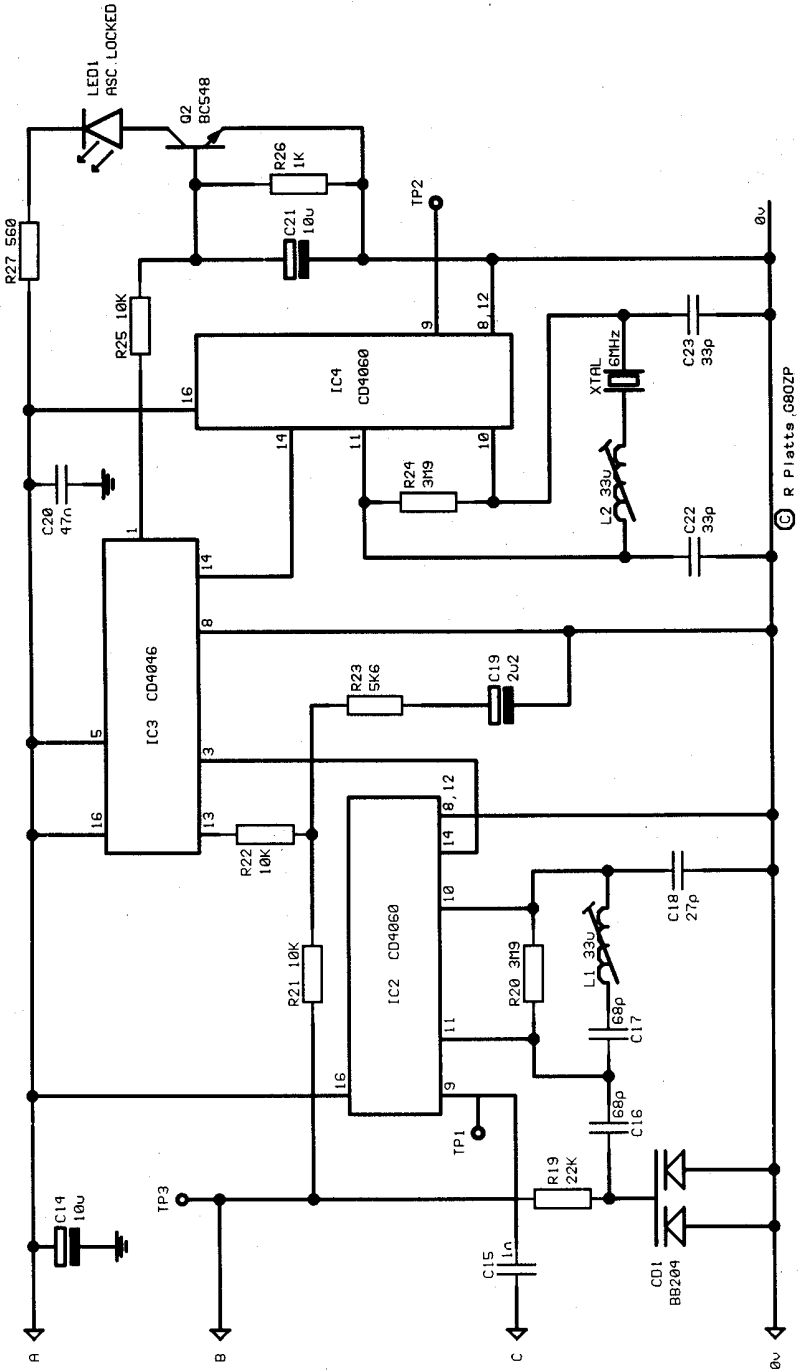
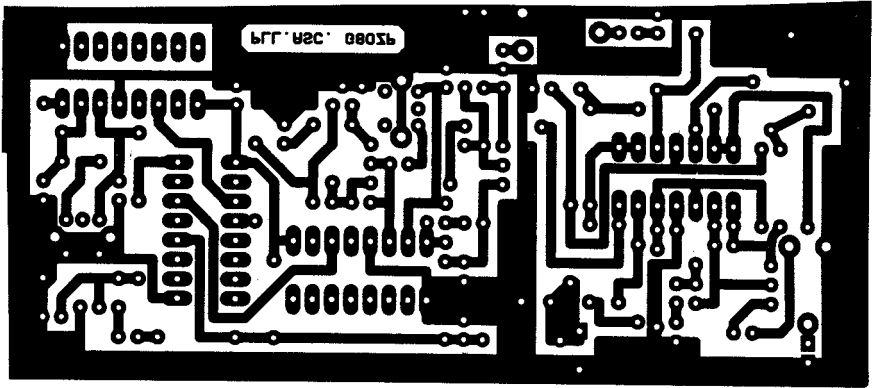


Fig 2. Phase Locked Loop.





6802P

Fig 3. PCB. Artwork

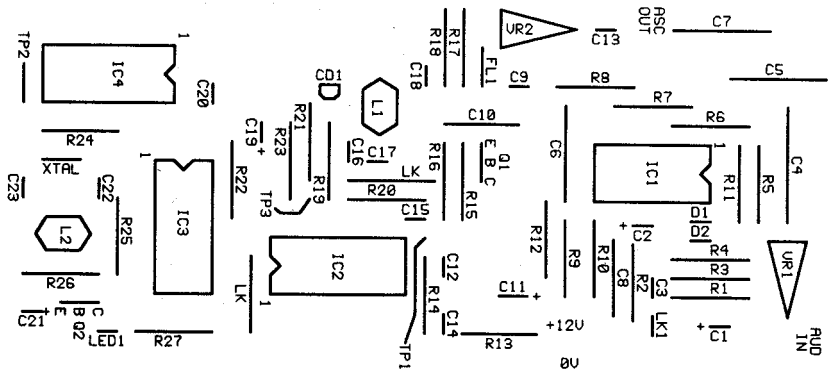


Fig 4. Component overlay

Most components can be determined from the schematics. C4/5/6 and 7 are polystyrene. C8 and C10 are dipped case polyester. Electrolytic caps are all radial. All other caps are 2.5mm pitch ceramic. FL1 is a SFE6.0MB. L1 and 2 are Toko 119ANA5870HM. The Xtal is a stock 6MHz crystal. Two wire links are fitted, one by R20 and a second by pin 1 of IC2.

All components are available from Bonex or possibly Mainline.

After construction apply 12v and set the reference frequency by monitoring TP2 and adjust L2 to obtain 5.9996MHz. Monitor the voltage of TP3 and with L1, adjust to obtain 5v DC. The LED should now be illuminated indicating lock. Once connected to the transmitter VR2 can be adjusted for the appropriate sub carrier level. Apply audio and adjust VR1 such that the audio is not distorted by the limiting action of D1/2.

Due to the possible differing load capacitance's and resonance's of stock Xtals, the oscillator may not tune exactly to the required frequency. Increasing the values of C22 / 23 will lower the frequency slightly. If the frequency is several KHz low, replace L2 with a small trimmer capacitor of about 50pF to increase it.

In certain cases the output may not match the transmitter. If, upon connecting into the point where the existing intercarrier sound generator was connected, degradation in the video occurs, reduce the value of C13 until a good picture and adequate sub carrier is present. In some cases it may require reducing to as little as 4.7pF. It may also be advisable to use screened cable for the ASC output and to keep the length short.

Now we can now all sleep soundly in our beds at night, knowing that our transmissions are clean, of the correct bandwidth and rock steady. Well the sound anyway.

## Slow-Scan ATV with a PC

**Werner Bruckner, Munich.**

### **Foreword:-**

This is a circuit which enables a PC (AT or faster) to receive SSTV on hf, vhf or uhf. The computer should have a VGA graphics card and a VGA mono or colour monitor. A former EGA or CGA graphics card is not good enough because we need to display at least 16 grey levels for fair picture quality.

The advantages of this circuit are:-

- Simple hardware and adjustment.
- Simple connection to the receiver.
- Uses the Centronics printer port
- Enables the many radio amateurs who own a PC to use SSTV.

SSTV was developed by radio amateur, who originally used monochrome cameras with modified deflection to send and radar cathode - ray tubes to display the images. Nowadays it is possible to follow the transmissions comfortably and easily because the computer's built-in frame store enables flicker-free pictures to be displayed (see the pictures). The more commercial "FAX" cannot be received with this circuit. However, despite the substantial advances in computer technology in recent years, it is necessary to use a small interface because the computers are still too slow to manage this facility.

### **Explanation of the circuit.**

The purpose of the hardware is to digitise the received audio so that the computer can understand it (zero and five volts TTL). I.C.'s U3A and U3B (TL084 or LM324) amplify the audio from the speaker. This is sufficient to create a zero - 5 volt TTL format. It must now be converted to binary form.

With every negative-going edge of the TTL pulses, the I.C.'s U4A and U4B create short needle-pulses. Then follows a circuit originally described by DL2RZ. He digitised the picture into 16 grey levels by using 4 bits (i.e. four wires) and detected the sync. tone with separate, analogue circuitry. But there is no need for this analogue sync. recognition if five wires are used (i.e. to digitise 5 bits). By using five bits the resolution is good enough to cover the whole frequency range i.e. from sync (1200) to black (1500) up to white (2300). Thus the computer will be able to recognise the sync. without any further hardware. The addition of this extra wire is quite simple.

Two monostables, U2A and U2B, are started by the pulses coming from U4B. However, U2B is used as an oscillator. The pulses created in U2A and U2B will be counted by U1A and U1B for as long as monostable U2A is enabled. U2A resetting will stop the counters. When U2A is adjusted for a cycle of 0.42 msec (i.e. the lowest countable frequency of 1200 Hz) the osc. U2B should deliver 32 pulses.

The IC U5 is used as a digital 5-bit memory and will store the result up to the next incoming cycle. U7 converts the binary information to decimal and the 16 LED's display the result. Higher tones create low numbers and v.v. Normally it would be necessary to use an IC to deal with this inversion - however, if a computer is used, the software does it.

So. If 1200 Hz (sync) is fed in, the left LED will light; if 2300Hz (white), the right LED lights and so on for the range of LED's in between. The converter creates 32 steps on 5 wires; the computer sees these 5 bits and is able to measure out the range from 2300 - 1200 = 1100Hz. This means 32 steps of 34.375 Hz. The LED's show 16 steps using 4 wires; this represents steps of 68.75 Hz which is good enough for tuning the radio.

This circuit has been tested and, because it only needs two adjustments - the period of U2A and the frequency of U2B - is ideal for SSTV beginners. To keep the hardware simple the PLL which synchronises the clock of the computer with the real-time-clock of the pictures has been left out, so the pixel-uncertainty which is therefore created at the beginning of each line simply has to be tolerated. Naturally, those who want to have a PLL can easily install one.

### **Connection to the computer**

This is made via the standard Centronics Printer port and printer cable. Simply use the standard 36-pin plug, available from any computer shop. If you don't want to keep having to switch the cable between printer and SSTV hardware it is recommended you buy a second Centronics card for LPT2.

This may seem confusing as the normal function of Centronics is to send data, not receive it. Don't forget that a printer receives and sends certain data to a computer eg. the "error", "acknowledge", "busy", "paper end" and "select" info.

Simply read the address HEX 378 (LPT1) or HEX 278 (LPT2) with the weights 8, 64, 128, 32 and 16 which correspond to the above information.

The programme has to read the info. from each of these five wires very quickly and calculate it to grey levels before displaying it on the VGA screen. That's the reason why a fast computer is needed, even when some experts in machine-language can do it with a slow machine as well.

There are many modes for the VGA graphics on an IBM or compatible, but at the moment only the mode 13h is important for radio amateurs. This is the only mode which is addressable world-wide with a resolution from 320\*200 in 256 colours or 16 grey levels. Only in this mode is it certain that, wherever they are, the readers will be able to use the programmes successfully.

It should be noted that an expensive colour CRT is not necessary as a simple grey-level CRT can do the job just as well, provided it is a VGA monochrome. It is not possible to use the former TTL CRT's eg. Hercules, as they display only a black or white with no grey levels.



## The software

There are many computer languages for the PC but the only useful ones are those which are quick enough and enable access to the frame-store. BASIC is not good enough, but PASCAL or C++ can do it quite well.

The last problem is the different computer clock-rates. We are involved with a real-time problem - a need to display every SSTV line within 60 milliseconds (ie. 128 pixels on a line ) or within 120 milliseconds (ie. 256 pixels on a line). The computer, therefore, should not run slower or faster otherwise a part of the picture will be lost. Thus the need for a clock-measurement on your computer which is facilitated by executing a special programme that fixes the clock-rate on the disc. This has to be done before starting the main programme. The author is able to send you a floppy disc for a fee of #10 where all these problems are solved. You will get the source-code and ready-compiled programmes to receive and store transmissions in black and white with 8 and 32 seconds duration. A pcb is also available; further info. on request.

## Usage

A small 5 volt 40mA power supply will be needed; alternatively, use four size AA nicads (1.25v each) High speed CMOS IC are recommended, which need very little power.

Either the loudspeaker connection or the audio line can be used. When tuning for a SSTV signal, watch the 16 LED's. When the 1200Hz LED flickers rhythmically with 16Hz or 8Hz, you are properly tuned in and can expect pictures. With a little experience you will soon hear the difference between the 8 and 32 second mode, as well as the differences in the FAX tones, which is signified by the long duration of transmissions (sometimes as long as 5 minutes). In SSTV mode the duration is much shorter, giving a better security against QRM.

Every Sunday you will find SSTV stations, especially on the 20 metre band. All radio amateurs not using SSTV are asked to avoid working on 14.230 MHz and maintain a reasonable distance to this QRG, otherwise the pictures may be disrupted. The pictures shown here are records of the contest in March 1992 in the 8 second mode with 128\*128 pixels.

I wish you a good reception of SSTV pictures.

Traders, Lecturers, Exhibitors,  
Demonstrations etc, etc are  
most welcome

Accommodation and Saturday  
evening dinner

**Hope to see you there!**

**CAT'96**

**1<sup>st</sup> September 1996 at the  
Post House Hotel, Crick.**

# An Improved NBTV Pattern Generator

## Grant Dixon

I was inspired by some recent articles in the NBTVA news letter to produce a pattern generator which is both flexible and easily adapted to one personal preferences as the patterns are held in EPROM. The completed article then appeared in the NBTVA news letter and I would like to thank the editor for permission to reproduce it here. Pete Smith designed a very neat little pattern generator which is very useful as a reference but it could not produce text or pictures.

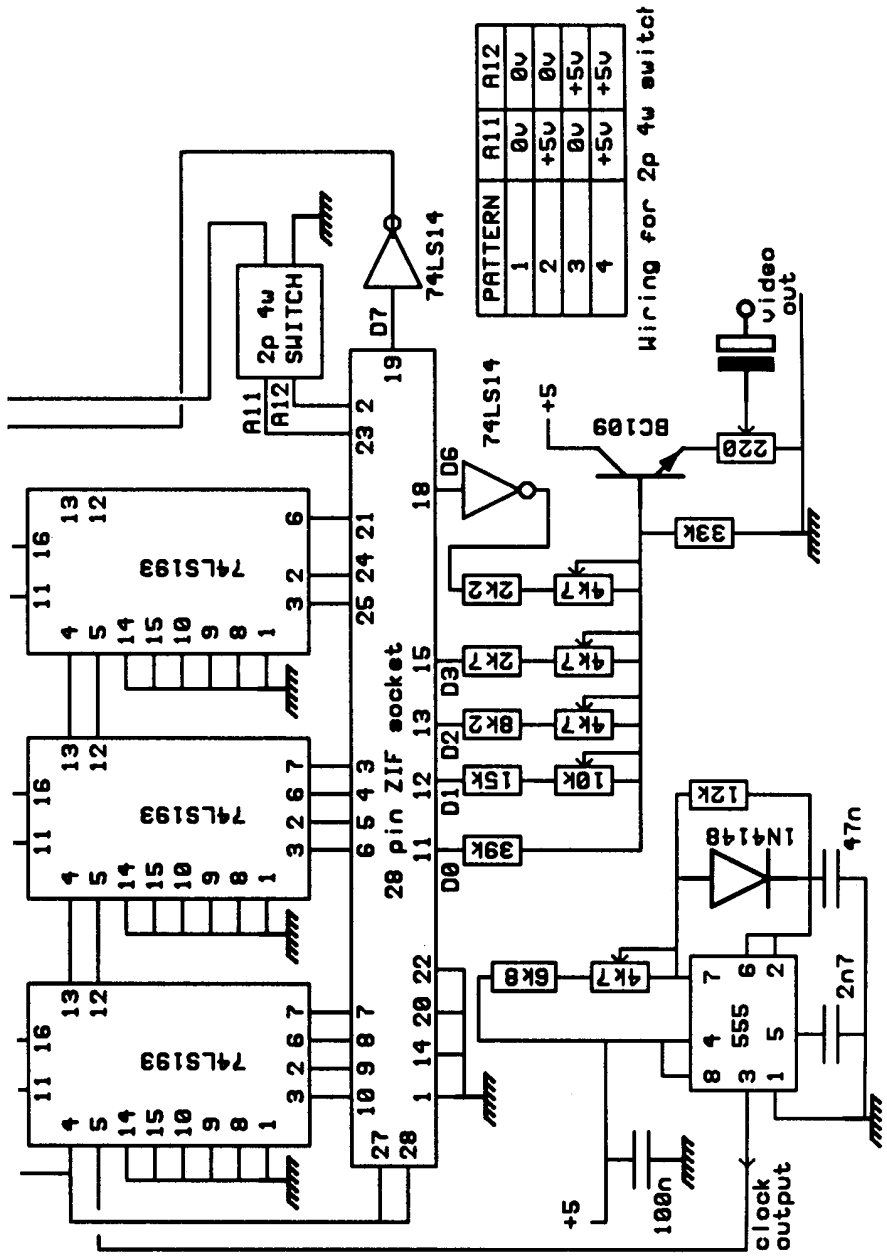
Klass Robers published the design of a very comprehensive generator which produced a large variety of digital patterns.

Des Kostryca designed a generator using an EPROM but his design was limited to black and white text. My design is based on his original concept and I am grateful to him for some help in the initial stages. The first improvement was to include a 16-level grey scale and the second improvement was to program the EPROM with four pictures. The EPROM which was used is a 2764 which holds 8k (i.e. 8 x 1024 bytes of data. A byte of data consists of 8 bits and each byte emerges from the EPROM via 8 parallel lines. To confuse the user somewhat these are numbered 0 to 7 instead of 1 to 8!! In my design I use bits 0, 1, 2 & 3 for digital video; bit 6 for line sync pulses and bit 7 for resetting the clock counter at the end of a picture.

## EPROM Contents

The NBTV picture consists of a 32 x 48 array of pixels....1536 for each picture. A bit of simple arithmetic shows that you could get 5 pictures of this size into the chip; however, it would be rather difficult to calculate all the addressing necessary. I decided that it would be better to limit the number to four as one can then select each one by simply switching the top two address lines with a 2pole 4way switch. If I had used a 74128 EPROM then a 3 pole selector switch would have to be used to select one our of eight pictures. I made this decision because 2764s are more readily obtainable and if one used a ZIF socket in the pattern generator the EPROM can easily be replaced with another one carrying different patterns.





## Mode Of Operation

A clock generator is needed to produce the timing pulses to run the generator. The circuit is given for a simple 555 oscillator but for extreme accuracy a crystal clock would be better. The frequency needed is  $48 \times 32 \times 12.5$  which gives 19,200 Hz. This clocks the address counter which comprises three 74LS193 synchronous counters. Their CLEAR lines are held low which permits them to count and when they have counted up to 1536 the output from the EPROM on line D7 goes high, this is inverted and provides a LOAD instruction. As the input lines to the counters are all at zero this resets the counters and the picture starts all over again. The four output lines which carry the video go to the base of the BC109 transistor through summing resistors thus forming a simple but effective digital to analogue conversion. These resistors need to be in the ratio 8:4:2:1 and some trimmer potentiometers are provided to get the values right. The output from D6 is positive for the last 3 pixels of each line and, when inverted in the 74LS14, this provides a negative sync pulse which is also added.

## Construction

The layout for a printed circuit board is given and if sufficient members express an interest then the Club will get some boards made up professionally. Most of the components are pretty standard; the ZIF socket is a rather expensive item but you can always use a standard IC socket. I have found that the turned pin sockets grip the IC rather too well and it makes removal rather difficult, much better to use the type of socket which has a side-wiping spring contact. For the 2pole 4 way switch I used a wafer type rotary switch; the wiring for this is shown in the table. I am now in a position to program EPROMs for club members provided they can supply the appropriate data as a disc file for the PC Computer. You could program your location, a picture of yourself, or of your wife, a pattern you have designed yourself etc. etc. I intend to make up a small information pack showing how the programs are written.

## References

- |    |             |                               |                     |
|----|-------------|-------------------------------|---------------------|
| 1  | P.E. Smith  | Triple Waveform Generator     | NBTV Vol 18 No 1 p5 |
| 2. | K.Robers    | Sync & Test Pattern Generator | NBTV Vol 18 No 4 p3 |
| 3. | D.Kostrycza | Caption or Pattern Generator  | NBTV Vol 19 No 2 p5 |

space for pcb diagrams

## Review by Dave Lawton

The version reviewed is the 'Summer 1995, version 3.3 for DOS.'

The software was installed on a 386 SX 40 Mb PC with 4 Mb's of memory. The minimum requirement is an AT PC 286 or better, 3.5 DS-HD Floppy Drive, Hard Drive with 11 Mb free disc space and MS-DOS 3.3 or higher.

The software comes on three 3.5 " discs and is accompanied with several sheets of A4 instructions and information. The installation was quite straight forward following the instructions provided and it only took a few minutes. Because of software piracy the Callbook software is copy protected and is licensed for installation on one computer up to a maximum of three times. After this the discs will have to be returned to be checked if replacements are required. Of course this will be no problem for the genuine purchaser.

Although the program is called 'Callbook' it supplies much more information. Data on Repeaters, Beacons, Mailboxes and Nodes are also covered.

The program is run from the DOS prompt with C:\CALLBOOK\CALLBOOK assuming the software was installed in the directory CALLBOOK as suggested in the instructions.

You are offered a menu screen giving the five options as listed above. You can select an item from the menu by using the up/down arrow keys or by typing the first letter of the word. A nice feature of the software is that the 'ESC' key will always take you back to the previous menu. Each screen always shows what functions can be selected and which keys to press making finding your way around the various menus extremely easy.

## Callbook

Enter the callsign you require and press enter, this will display the full details of the station. If an amateur has elected to have his "Particulars Withheld" this is the only information given. Once a callsign has been selected you can step to the next or previous callsign by using the F1 or F2 function keys.

By selecting F9 you are given the option to search by Address, Postcode or Surname. You also have the option to find all the callsigns within a given postcode.

You cannot use the first line of an address for the search but you are able to search on subsequent fields of the address such as Town or County.

A partial search on postcodes is also available, e.g. a search on HP12 will list all amateurs within that postcode area. I also discovered that there are 17 radio amateurs with my surname.

## Repeaters

A Repeater can be selected by typing in it's callsign, details of location, frequency, locator and CTCSS are given. By using F7 the repeater keeper details can be selected. F6 brings up a list of all the Repeaters, you can scroll up and down the list

with the arrow keys and select a particular one by pressing ENTER. Selecting F8 gives other repeaters on the same frequency and F10 will identify the callsign in Morse code.

Searches can be carried out on Address, Frequency and Same Frequency. When searching the use of 'Wild Cards' is allowed, e.g. GB7\*\* or GB7?? The data also covers Repeater within Europe

Search on Address is available as with Repeaters or selecting F6 gives a full list in Callsign order which you can scroll through to find the one you want. World-wide information is given for Beacons.

## **General Comments**

The data for callsigns is supplied by the SSL on behalf of the Radio communications Agency, all other data, except WAB, was supplied by user groups and reliable sources. I found several minor errors in the data for Beacons and Mailboxes, however, the information can be only as good as that supplied to the authors, they would be pleased to hear about any necessary corrections needed.

Overall I found the software very easy to use, the information being relatively up to date, and frequent updates are offered. I also found a few minor software bugs which have been referred back to the authors, the majority of which I am informed have been fixed in a later release of the software. These did not interfere with the main operation of the software.

The data on Mailboxes given was for AX25 boxes, I would also like to see data for TCP/IP boxes included. The current version is V 3.5A which was launched at the Leicester rally and contains data up to 1st September. Updates cost 9.95 inclusive for currently registered users.

The software costs £14.00 including postage and is available from ... G0LOV & G4LUE Amateur Software, Hild Avenue, Cudworth, Barnsley, South Yorkshire. Phone 01226-283021, Internet njh@smsltd.demon.co.uk

### **Reprinted and adapted from Electronics Now**

This very powerful character generator uses state of the art electronics to enable powerful video captions to be created from a relatively simple circuit. The keyboard can be the PC surplus variety or various other options (see text).

The overlay area consists of 12 rows of 24 characters per row or 6 rows of 12 characters per row of double-size characters. A maximum of 110 normal-size characters, including line feeds, can appear on the display at any one time, or a maximum of 72 double-size characters can be displayed.

To input text, any of three interfaces can be used, all connected through a female DB9 connector or the Eurocard connector. First, an IBM PC/AT type keyboard can be attached, allowing a user to type in over-lays. Second, commands can be input from an interactive RS-232 interface. Last, an RS-485 network-type interface is provided. The RS-485 interface conforms to the HCSII protocol used in the Circuit Cellar Home Control System Network. (The RS-485 system allows for multiple devices to be connected to a common bus and can 'talk' to each other under control of a 'master' controller).

Overlay text is stored and recalled from a 1024-bit EEPROM with non-volatile data storage. Character intensity and outline can be individually adjusted via software-controlled potentiometers (EEPOTs).

The following description of the circuit refers to the original configuration of the unit which was designed to mount in a box. All of the connections, including the video signals are 'extended' to the DIN 41612 PCB connector. Where appropriate in the following description the PCB pin number will be shown in square brackets [ ].

### **The 87C055**

The 87C055 microcontroller for television and video from Phillips Semiconductor is the heart of the Video Titler. It is a derivative of the industry-standard 80C51 microcontroller. The 87C055's features include:

## **16K × 8 one-time-programmable (OTP)( EPROM**

- 256 × 8 RAM
- On-screen display (OSD) controller IC
- 128 × 10 display RAM
- 60 × 18 × 14 character generator generator OTP EPROM
- Eight 6-bit pulse width modulators ICs
- One 14-bit pulse width modulator IC
- Two 16-bit timer/counters
- D/A converter/comparator with 3-input multiplexer
- Four high-current open-drain outputs
- Twelve high voltage ( + 12v) open drain outputs

Many of those resources are not used in the video titler circuit, but they could be useful to readers who can write their own software.

### **Circuit description**

Figure 1 shows the schematic of the video titler circuit. The power-on reset function is generated by IC7, a Maxim MAX699 reset and watchdog pulse generator. That device supplies a reset pulse of 140-500 milliseconds at power-up. The watch-dog function is enabled by tying the WDI input at pin 6 to a logic high or low; if the pin is left floating, the function is disabled. Therefore, if jumper JPI is inserted, the watchdog function is enabled. This pin must be toggled a minimum of once a second, or the watchdog will time out and generate a reset to the processor, the pin is toggled by port 2 bit 2. The reset from IC7 is inverted by transistor Q1 because microprocessor IC1 requires an active-high reset.

The overlay text must be synchronised, or genlocked to the input video. Genlocking is simply the synchronisation of two video sources by locking horizontal and vertical timing together. This is accomplished with some external parts as well as the OSD controller in IC1. First, the horizontal and vertical syncs from the composite video input are detected by IC2, which is set for PAL specification horizontal and vertical synchronisation by timing resistor R4 and C26.

The detected horizontal and vertical sync are fed to IC1. The OSD controller in IC1 uses these signals to internally synchronise the overlay text to the incoming video. The frequency of the dot clock is controlled by components L1, C5, and C6. Text is overlaid by video multiplexer IC5 which is controlled by IC1. This device has onboard input clamps and a 75-ohm output driver. The video input can be terminated to 75 ohms by fitting jumper JP2.

The overlay character outline and intensity are controlled via solid state potentiometers IC3 and IC4 respectively. The solid-state potentiometers allow the microcontroller to control the position of their wipers and store the settings in an onboard EEPROM. This provides a self contained, non-volatile, software-controlled potentiometer. The microcontroller's OSD logic controls the multiplexer timing from the BF (IC1, pin 30) and VIDCTL (IC1 pin 25) signals. The BF signal switches the

video multiplexer between character and character-outline video, and VIDCTL switches the multiplexer between the input video and the overlay video from IC1. The DC levels from IC3 and IC4 set the character and outline intensity, and these levels are fed to the video multiplexer IC5. The output of IC5's internal multiplexer is fed to an internal 75 ohm output driver and then output at pin 7.

The video titler can store and recall text from EEPROM IC6, which has enough capacity to store one overlay screen and other required data such as network address, horizontal and vertical overlay, fine position, and type of interface.

The RS-232 interface is provided by a MAX202 transceiver which contains two line drivers and two receivers. The device also contains a charge pumps that allows it to generate + 10 and -10v sources for the RS-232 interface from a single +5 volt supply. The RS 485 interface is provided by an LTC 485 transceiver that provides both transmit and receive functions. The keyboard interface is basically a direct connection to the microprocessor.

## Construction

It is proposed that if there is sufficient interest in this project, the club could look into putting a PCB together and aranging a source of pre progammed controlers. The software is available on one of the state side BBS and the circuit diagram is not beyond putting together a PCB design. If you are interested please drop the editor a line and enclose an S.A.E

It is best to deecide whether you are going to use the Titler with only a keyboard. If so you will not need to fit the RS232 interface (IC9 and associated components), the RS485 interface (IC8 and R8) or the DIL switches (S1).

The following list of interconnecting cables is extracted from the original article and of course refers to the 'Boxed' version of the PCB. If you are rack mounting the card then a list of the required connections is provided to enable you to connect to your chosen connector(s) on your rack.

## Cables

There are three possible interfaces and therefore three different cables. All three terminate in a female DB9 connector J3. Figure 4 shows how to wire the three different cables.

**Serial RS 232** The RS 232 serial cable is simply a one to one male female cable that ties pins 2, 3, and 5 together. Only pins 2, 3, and 5 must be connected. Any RS232 signals driven into other pins can cause damage. (see Fig 4a)

**PC/AT Keyboard** Rather than make this cable from scratch, a readily available PC/AT keyboard extension cable can be purchased and modified. Many computer shops have these cables. By cutting of the male end( the one that does not mate with the keyboard) and installing a DB9 male connector, this cable can be assembled quickly. After cutting off the connector, the wires will have to be tested for continuity to determine which pin goes to which wire.(see fig 4b)

**RS 485** RS 485 generally involves connecting network wires to a terminal block. Since the board space did not make this practical, the RS 485 were assigned to two of

the pins on the female DB9 connector J3. The reader can connect these in any manner that makes sense in the chosen network environment.(see fig 4c).

## **The first power-up**

On the first power-up the software will initialise the EEPROM (IC6) checksum, set the EEPROMs, (IC3 IC4) to default intensities, and overlay the video titler character set on the display. Connect a noise free composite video source such as that from a video camera to the video input connector J1. Next connect video output J2 to a composite video monitor or the video input of a VCR who's output is connected to a TV. Install jumpers for JP1-JP4 and S1-S5 as needed for the type of interface you are using see (fig 5). For the first power-up, a serial RS 232 or keyboard should be used.

The cables for the chosen interface should be attached to J3 and connected to the keyboard or RS 232 serial device ( a dumb terminal or PC running a terminal emulation programme). Connect a suitable 8 to 12 volt supply to J4. The display should initialise to the power-up default overlay screen which displays the titler's character set.

The character set is programmed into the 87C055 microprocessor's EPROM. The set contains alpha-numeric as well as some special characters. The characters can range from white with a black outline to black with a white outline. The characters are not reprogrammable. Once the characters are programmed in the EPROM of the microcontroller, they are fixed.

If a keyboard was chosen as the interface, it should be functional at this point. If a serial RS-232 interface was chosen, a banner should appear on the display of the connected terminal or PC.

## **Interfaces**

With an IBM PC/AT keyboard attached, the user can simply type-in overlays and manipulate them in various ways. An interactive RS-232 interface provides a prompt that allows the entry of commands.

When using the keyboard interface, in addition to the standard alphanumeric keys, certain function keys are recognised. The function keys are outlined in Table 1. If you press the F1 key, the video titler will respond by clearing any overlay present and put a cursor in the upper left corner of the display in row 1, column 1

When column 24 of any line is reached, the next character will roll to the next line in the column 1 position. When the cursor is at column 1, the backspace key will move the cursor back to column 24 of the previous line.

## **RS-232 serial interface**

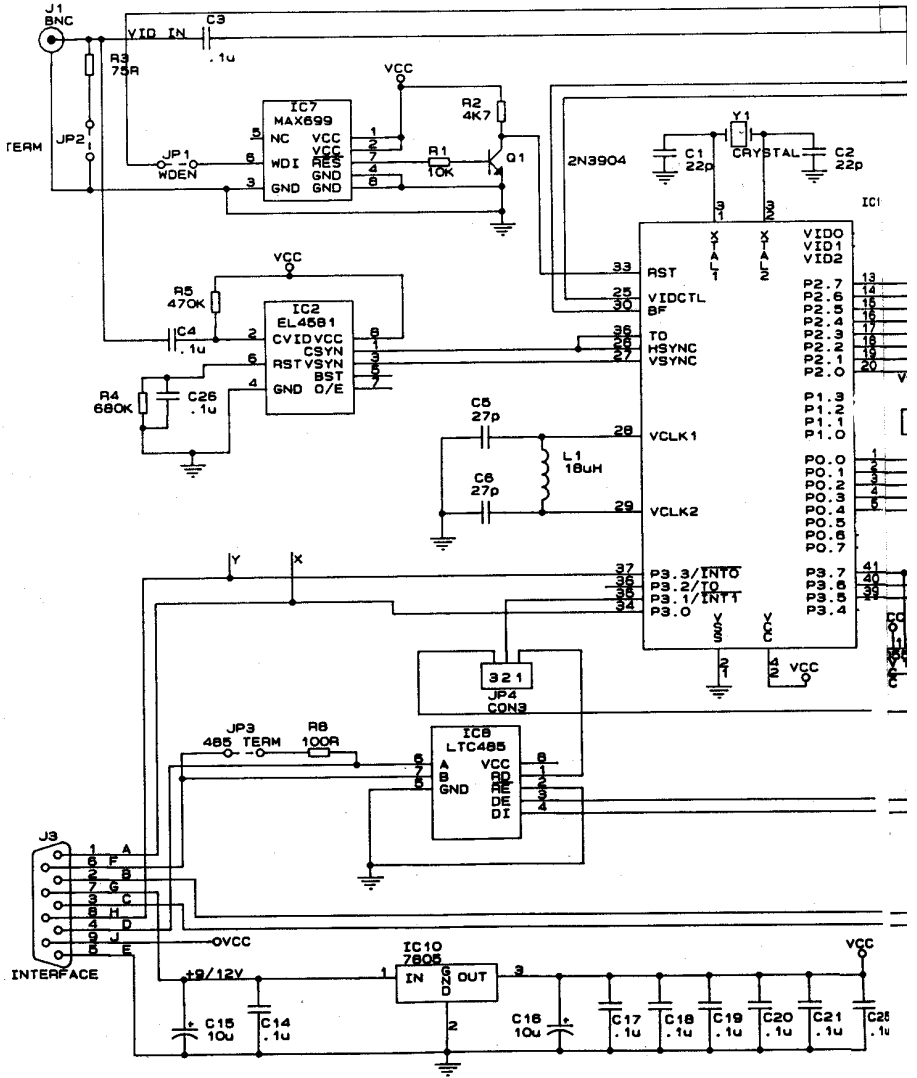
The RS-232 interface can be used in a Network or Interactive mode. It is, however, mainly meant to be used with the Interactive mode.

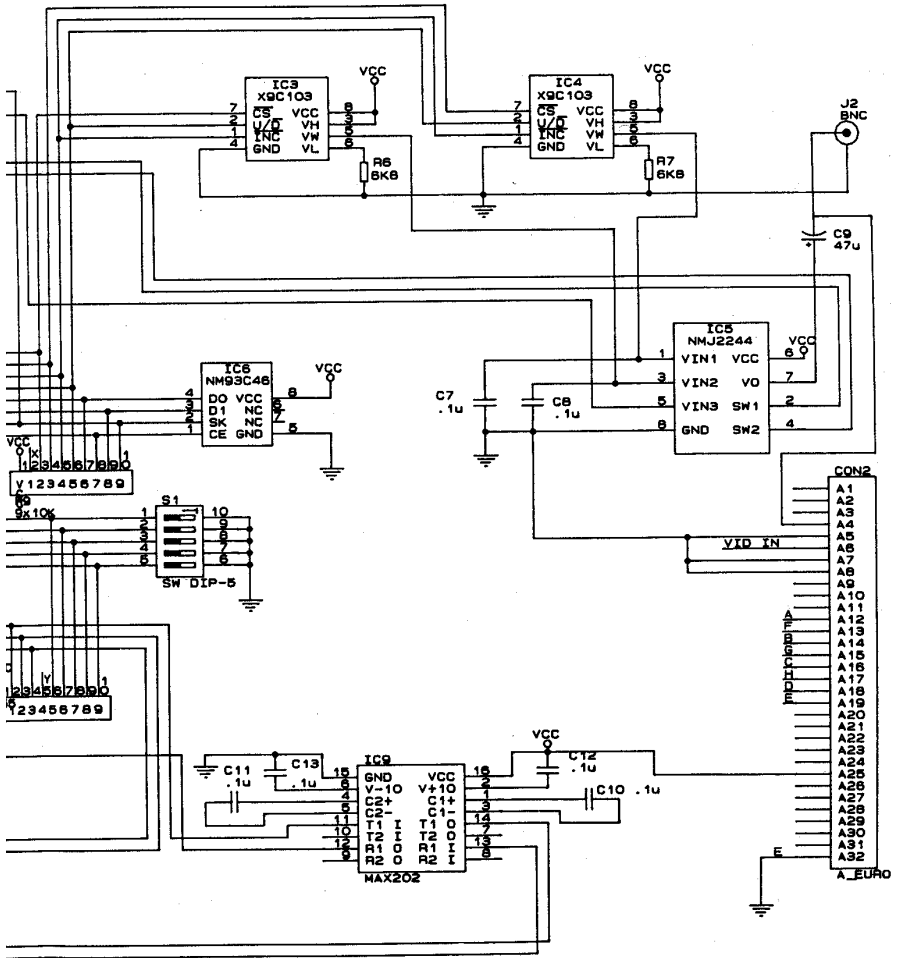
In the Interactive mode (No), a "dumb" terminal can be attached and commands can be given. In either case, jumpers must be installed on the board in the proper positions for the RS-232 interface selection (see Fig.5 for details on setting the jumpers).



The DIP switches marked S1-S5 are to activate certain functions. The switch inputs are read via the “ø” command from the serial interface. Only switch closures since the last “ø” command are reported.

The Interactive mode can be selected at power-up by closing the S2 contacts. It can also be selected from the Network mode by generating command NO. The interface can then be changed to RS-232 via jumpers and a “dumb” terminal can be attached.





When used in the Network mode, the address and optional checksum portion of the command string is required. If the Interactive mode is selected, the address and optional checksum are omitted. When the Interactive mode is selected, a sign-on screen will be sent to the terminal along with a prompt that indicates the Network address. The address defaults to TERMO at the first power-up. The Interactive mode is the easiest way to set up the Titler. Some examples in the RS-232 Interactive mode are shown in Fig.6.

### **Power-up overrides**

At power-up, certain override functions can be performed by closing S1 and S2. If S1 is closed at power-up, the titler will force all parameters to their defaults. This will put the video titler's default character set on the display, set the address of the unit to TERMO, and the mode of the unit will be Interactive. This is a good way of forcing a start from a defined point if everything else you try fails. If S2 is closed at power-up, the titler will assume Interactive mode of operation. This is equivalent to entering the "NO" command from the Network mode.

### **Table 1 - Control-Key Functions**

#### **F1 Enter Edit Mode**

Automatically clears the screen and places the cursor at line 1 column 1. Once in edit mode , overlay text can be entered.

#### **F2 Exit Edit Mode With No Overlay save**

Exits the edit mode and no further editing of characters on the screen can occur. No Overlay data is saved.

#### **F3 Exit Edit Mode and Save Overlay**

Exits the edit mode and saves the current overlay data. This includes the fine horizontal and vertical position.

#### **F4 Recall Overlay**

Recalls the stored overlay data and puts it on the screen.  
This function is not available in Edit mode.

## **F5 Clear Overlay**

Removes all overlay data from the screen.

## **F6 Increment Character Intensity**

Increments the intensity of the overlay character video. The increments are small, so many keystrokes may be required. The key can be held down for a repeat increment. Each new setting is stored.

## **F7 Decrement Character Intensity**

## **F8 Increment Character Outline Intensity**

## **F9 Decrement Character Intensity**

## **F10 Turn Overlay Display Off**

## **F11 Turn Overlay Display On**

## **F12 Display Character Set**

This function is not available in edit mode

## **SHIFT + F1 Wipe On Effect From Top to Bottom**

The current overlay is turned off, and then repainted from the top to the bottom of the screen. This has the same effect as turning on the overlay display (F11). The presentation is the only difference.

## **SHIFT +F2 Wipe On Effect From Bottom to Top**

The current overlay is turned off, and the repainted from the bottom to the top of the screen. This has the same effect as turning on the overlay display (F11)

## **SHIFT +F3 Wipe Off Effect From Top to Bottom**

The Screen will redisplay the current overlay if it is off, then it will begin removing the overlay from the top to the bottom of the screen. This has the same effect as turning off the overlay display (F10).

## **SHIFT +F4 Wipe Off Effect From Bottom to Top**

The screen will redisplay the current overlay if it is off, then it will begin removing the overlay from the bottom to the top of the screen.

### **SHIFT +F5 Set Double Size Character Height/Width**

Characters are set to double height/width, allowing 6 rows of 12 characters per row. If the screen already has more than 6 rows or 12 characters in a row, this key sequence will cause distortion on the display. (This is a limitation of the video controller.) The screen must either be in a 12-character-per-row, 6-line format, or must be cleared before using the key sequence.

### **SHIFT +F6 Set Normal Size Character Height/Width**

Sets characters to the normal size, allowing 12 rows of 24 characters per row. This function is not available in Edit Mode.

### **SHIFT +F7 Overlay Display Blink On**

The overlay display will begin blinking

### **SHIFT +F8 Overlay Display Blink Off**

The overlay will stop blinking if it is currently doing so. The overlay will be left in the on state.

### **ENTER Go to New Line**

Move to the first column of the next line on the display. If Edit mode is not active, this key is ignored.

### **←(Back Space) Move Cursor Left and Erase**

If the cursor is in column 1 when the keystroke is received it will move up to the end of the preceding line. If Edit mode is not active, this key is ignored.

### **← Move Overlay Screen Position Left**

Moves the entire overlay screen to the left by four character dots. This is used for fine horizontal positioning of the overlay characters.

### **→Move Overlay Screen Position Right**

Moves the entire overlay screen to the right by four character dots.

### **↑ Moves Overlay Screen Position Up**

Moves the entire overlay screen up by four horizontal lines. This is used for fine vertical positioning of the overlay characters.

### **↓ Move Overlay Screen Position Down**

Moves the entire screen down by four horizontal lines.

## **Interface Selection (Figure 5)**

**HDR1      JP4      Interface**

10	11	12	
In	X	X	Keyboard
Out	In	Out	RS 232

X = Don't Care

### **Watchdog Generation**

JP1	Function
IN	Watchdog Timer Enabled
OUT	Watchdog Timer Disabled

### **Video Input Termination**

JP2	Function
IN	Video Input Terminated to 75 ohm
OUT	No Video Input Termination

## Components

Quantity	Package	Value	Components
2	CAP 0.1	22P	C1,C2
19	CAP 0.2	.1U	C10,C11,C12,C13,C14,C17 C18,C19,C20,C21,C22,C23 C24,C25,C26,C3,C4,C7,C8
2	TANT 0.2	10U	C15,C16
2	CAP 0.1	27P	C5,C6
1	TANT0.2	47U	C9
1	DIN41612	EURO-connector	CON2
1	42SHRINK	DIP 87C055	IC1
1	REGulator	7805	IC10
1	DIP8	EL4581	IC2
2	DIP8	X9C103	IC3,IC4
1	DIP8	NMJ2244	IC5
1	DIP8	NM93C46	IC6
1	DIP8	MAX699	IC7
1	DIP8	LTC485	IC8
1	DIP16	MAX202	IC9
2	BNC B	BNC	J1,J2
1	DCON9	INTERFACE	J3
1	2 PIN JP	WDEN	JP1
1	2 PIN JP	TERM	JP2
1	2 PIN JP	485 TERM	JP3
1	3 PIN JP	CON3	JP4
1	AXIAL0.4	18UH	L1
1	TO92N	2N3904	Q1
1	AXIAL0.4	10K	R1
2	SIP10	X10K	10,R9
1	AXIAL0.4	4K7	R2
1	AXIAL0.4	75R	R3
1	AXIAL0.4	680K	R4
1	AXIAL0.4	470K	R5
2	AXIAL0.4	6K8	,R7
1	AXIAL0.4	10R	R8
1	DIP14	SW DIP-5	S1
1	HCU38	12mhz CRYSTAL	Y1



### Graham Hankins G8EMX.

Well, here comes my first shot, as the "new kid on the block"! And I must - can only begin with a big thank you to our previous scribe, Andy Emmerson. Andy has always made TVOA very readable, even when his "In" tray was nearly empty. Fifteen years of copy is one heck of a word-count!

Andy, you will be pleased to know that your "obituary" for UK Slow Scan was premature. SSTV in the UK is NOT dead. Soon after the November mag. hit the streets a PC (3 1/2) floppy with off-air JPEG format pics. and this letter in ASCII arrived on my mat

Banksia  
High Street  
Queen Camel  
Yeovil  
Somerset  
BA22 7NH  
8.12.95

Dear Graham, SSTV.

Andy Emmerson's comment on lack of SSTV news, in his final column, stung me into writing to CQTV. SSTVers do not seem willing to go into print very often. This is probably because they spend so much time on the air! In fact there is considerable activity on the bands.

I use an Acorn Riscpc, running a brilliant system devised by Paul Turner, G4IJE, who has been writing SSTV & Fax software for Acorn computers since the BBC B computer was the thing to have.

He can supply software & hardware details for use on all Acorn 32 bit computers.

1. Arcsstv runs on all machines & requires a "podule", or plug-in card in PC parlance. Most of the SSTV modes are provided, plus mono Fax.

2. Starcom also requires the podule & runs on the RiscPC only. This application has more facilities, including colour Fax modes.

3. Pscan is a development of ComStar. The principal difference being that it uses a serial interface. The "Hamcom" interface, as used by JVFX etc, is ok, but Paul can provide details of slightly more complex version, with improved filtering.

Demo software is available, along with interface details, from Paul at the following address.

Mr P. Turner, G4IJE  
61, Primley Lane  
Sheering  
Bishops Stortford  
Herts CM22 7NH.

I enclose a DOS 1.4M format disc, containing this letter in ASCII & a number of pictures received off-air in JPEG format  
*(Editor's note: when i find out how to reproduce them i will share them with you all G8CJS)*

Best 73,

Clem Tabor, G3UGR Tel: 01935 850463

Clem - thank you! This not only proves SSTV activity, but that members read this column - help! I cannot load the pics, maybe our editor can?

This letter illustrates some important principles for anyone sending reports for TVOA. I do prefer copy as ASCII files from word processors and on PC format discs, (NOT Mac) as per Clem's. You WILL get the disc back, of course. Another, quicker, cheaper method is via the packet network; I am at GB7SOL (BBS at Knowle, near Solihull) .

If you have neither a PC or packet then either typed or handwriting by normal mail. Can I ask that if you do literally put pen to paper - and many still are - that you are particularly careful that any name, phone number, or callsign is clear and unambiguous? "U"'s and "V"'s can be a problem in script! Everything received on paper will be typed and put on disc anyway, and I may make minor changes to structure. But I would hate to struggle with reading vital info then getting it wrong!

### **Now to Fast Scan.**

ATV repeater GB3HV, in High Wycombe, is operated by the Home Counties Television Group. Their Autumn newsletter "Line Out" has two intriguing pages listing faults, adjustments and modifications that have occurred in or have been made to the repeater during 1995. The power unit, for instance, has suffered from no less than three lightning strikes!

Mike Sanders G8LES, Technical Officer for GB3HV, has redesigned the switching logic for the four receive aerials. The computer now quickly steps round them, looking for line synchronising pulses and measuring inter-field noise.

The four results are compared and the best aerial used. John Stockley G8MNY reports in a packet message that this has given a 6dB gain advantage over an unswitched system!

Another newsletter I get is "P5" from the Severnside ATV Group. GB3XG on 10GHz is quote "now up and running again thanks to a lot of hard work by the chosen few". In the "body" is a chrominance equaliser and booster by G6TVJ, then on the back page an electronic morse keyer. Every repeater has to put out its call, so this is a useful little circuit, even if there are several other ways to do it!

I now seem to be keeping the records of Repeater Group BATC affiliations, and a recent check with Membership Secretary Dave Lawton revealed that there are seven repeaters not affiliated and many Groups seem to be out-of-date with renewals. This could also mean that the information I have been handed (from Brian Summers) is no longer correct. So, early in 1996 I will be asking for updated info. and renewals where appropriate.

An ATV bulletin on packet asking for activity news brought several replies. The first in came from Brian Davies GW4KAZ, chairman of the Arfon Repeater Group administering GB3TM in Anglesey. Brian writes (or rather types hi!) :

"GB3TM has been on-air for over 12 months without many problems and has handled contacts from G, GW and EI - yes, even some of the lads in Dublin come through under good conditions.

Activity on 1250MHz has certainly increased since GB3TM came on, as 24cm does not go through 1000 metres of rock easily!

There are over a dozen regular users, including John Lawrence GW3JGA, who helped put TM on air and is a regular contributor to the British Amateur Television Club's magazine CQ-TV".

Another TM regular, John Cronk GW3MEO, actually puts pen and ink to paper about a two-band linkup: "On Saturday September 2 I worked Denis Jones G3UVR (Wirral) via GB3TM, who was able to relay live pictures from a 10GHz link to and from G3SMU (Bolton), who in turn was receiving a 10GHz signal from special event station GB2QM on the Liverpool lighthouse. The pictures of the cruise liner "Queen Mary II" leaving Liverpool were excellent.

Great fun and a first-rate historic event to watch, thanks to GB3TM".

Denis G3UVR also receives ATV on 2.3GHz and is building a transmitter for this band. Even further up in frequency, he is constructing a complete ATV station for 24GHz! Thanks for your packet message Denis.

Several other callsigns replied that they were active on 70cm, I have made a note of them all so be prepared for a prompt before the next issue!

Some while ago I received a two-sheet typed letter from Harold Bent G0EWZ.

Harold uses the Nottingham repeater GB3NV and thanks new keeper Dave G6SKO and Richard G8BWC who has helped to maintain NV on-air. Another NV regular, Les G7EJG - a lockkeeper on the River Trent, has been seen showing off his steam engines. Then there is Alan G6ISB, who has been putting pics. from his CD-ROM into the box.

In the Midlands, Arthur Bevington G5KS (Oldbury) is a stalwart, active on 1250MHz, 430MHz and slow-scan. Arthur receives the Stoke repeater GB3UD at about P4 and GB3GV (Leicester) weaker at P2. He trained sons John G7UMB and Alan G7UMW through the RAE and they have followed dad onto these ATV bands. In November 1995 Arthur became an Honorary Member of the RSGB for more than 60 years membership. Congratulations! If anyone wants a contact or a test, they can ring Arthur on 0121-552 4456 but not before 11am please.

## **Birmingham Repeater:**

The embargo on new 24cm licences meant that the Birmingham University bods were going to go their own way on 10GHz, but as I have not heard from them since the Coventry rally, that "chapter" is closed, as far as I am concerned. Fortunately, as that was closing, another was opening! What seems to be a definite - and better - site could soon be available. Tests may have taken place in early January so there might be some real news next time.

A bit further south, I had a phone call from Tony Reynolds G8CEQ (Ashwater). Tony wants to put an ATV repeater into North Devon, so watch out for any developments on this! He is presently active on 430MHz with 20W on transmit and QTHR if you want to support a repeater project.

Much further south now, to New Zealand for an update on the Manawatu project mentioned in CQ-TV February 1995 Michael Sheffield ZL1ABS sent an early Christmas card and says: "While on holiday in Palmerston North, Wayne ZL1UJK and I assisted the Manawatu Technology Group to put their 615.25MHz (NZ Channel 39 50cm amateur band) ATV transmitter on air for testing.

It is running about 2W using a BLV93 in Class A linear mode into a log-periodic 14 element yagi. The test card is an "ATV Compendium" design (BATC) with 16 teletext pages. The transmitter is in Feilding and furthest reports are P2 strength pictures (locked and resolvable but noisy) at Palmerston North, 27km away. Input will be in the NZ 430MHz amateur band with vcr recording".

Now a long distance packet via satellite from: Mark, VK5EME@VK5LZ.  
#ADL.#SA.AUS.OC

Our repeater has been operational for about 2 years now but has lacked the ability to fully control it and produce on screen displays. We struggled quite a bit with the I2C boards. Some of the through plated holes were open circuit so we ended up taking out some of the chips and soldering wires through the holes. We now need to get some info on how to connect it to our repeater and some software to drive the boards for a IBM comp computer.

Our repeater has the following specifications:

Transmitter is similar to the BATC 1250MHz design running at 1207.5MHz 10mW O/P. This is then fed to a MAV11 amplifier and then to a KK7B X4 multiplier to pick off the 2nd harmonic of 2415MHz. This is then amplified to 300mW by a 3 stage YM3UMV amplifier. The low level signal is then fed through 10Meters of LDF150 to the power amplifier. The power amp amplifies the signal to an output of 5Watts using Mitsubishi MGF0904 / 0905 GasFETs. The 5Watts is then fed up 20Meters of LDF550 to a bay of 4 X Double figure 8 Quads giving an output of around 10W ERP from each of the 4 antennas, at 2415MHz.

The Receiver system consists of a primary input on 1250MHz FM. There is also inputs on 426, 444, 579, 1286.25MHz AM. The 1250MHz system uses a Alford slot antenna feeding 15Metres of LDF450 to the receiver. The receiver consists of a MGF1302 preamp feeding a receive converter using a chain of MAR6 amplifiers and producing an output on 479MHz. This is then fed to a I/F demodulator using a TOKO 479 Helical and Mar1 amplifiers. This then feeds a SL1452 FM demod etc. The range of the repeater is around 25 kilometers line of site for a P5 picture. It has been seen under good conditions at a range of 85Kms at P5. We are currently building a 30Watt amplifier using 2 X MGF0907 GasFETs to increase the range further.

73's from Mark VK5EME.....

+-----+

```
| *** Message via GB7LAN SATGATE. *** |  
| For info on AMSAT or the SATGATE, reqfil |  
| the file C:\GB7LAN\AMSAT.DOC from GB7LAN. |
```

+-----+

So, that's it for now! Please send reports of simplex activity, repeater news, photo's, slow-scan to me, Graham Hankins, G8EMX at 11, Cottesbrook Road, Acocks Green, Birmingham, B27 6LE.

## Preferred media:

PC 3 1/2" discs with ASCII files

Packet messages, my BBS is GB7SOL.

Temporary Internet address ghankins@pcmedia2.ebham.ac.uk

Hand written letters are still welcome, but PLEASE write essential info. clearly.

When, though? Well, to me, a deadline date is a deadline date. Chris has stated December 20 for this edition of CQ-TV, so my disc to him arrived a few days before that - even on the day! So, MY deadline for TVOA copy from you to me will be a fortnight before whatever date Chris Smith has set as his!

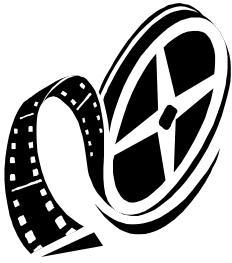
Meanwhile, 73's and, of course, P5!

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two page for Worthing adverts

two page for Worthing adverts





## KITS & BITS

### TVRO3 RECEIVER

A fully featured tuneable IF and demodulator with all components, except front panel controls, mounted on a single high quality 95 X 145mm PCB. May be used with a preamp for 24CMs or with a suitable LNB or converter for other bands. The unit is also suited for satellite reception. Main features... 12vDC operation, tunes 750 to 1700MHz, sound fully tuneable from 5.5 to 7.5MHz, Built in 13 or 18v LNB or

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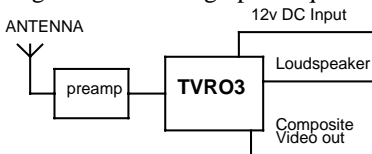
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preamp supply, 3W audio output, Dish alignment aid, adjustable video gain, S meter

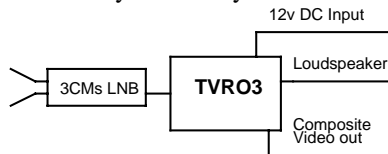
### FOR SALE

output, plus many more features.

The kit is simple to construct and due to the nature of the design, absolutely no alignment or setting up is required. Once assembled you're ready to receive.



24CMs RECEIVER SYSTEM



3CMs RECEIVER SYSTEM

The kit contains all parts except case, panel mounted components (4 pots and 4 switches plus meter(s) if required) and associated hardware.

**TVRO3 £50 all inclusive.**

## 3CMs LNBS

Low Noise Block converters have been the main contributive factor that has opened up the 3CMs band to ATV. With the low noise figures now available, transmissions are no longer restricted to short clear line of sight paths. Test transmissions have conclusively shown that over the horizon transmissions by various propagation modes are possible. None line of sight transmissions by means of scatter from rain clouds has also been achieved. When equipped with a suitable antenna (dish) operation well in excess of 100Km is readily achievable.

**Brand new converted 3CMs LNBS (JRC) 1.2 - 1.4db Nf £35 all inclusive**

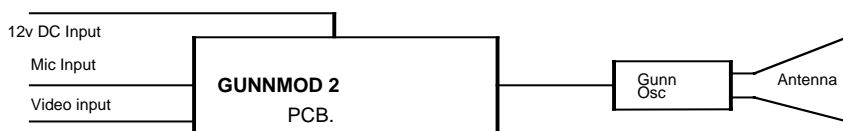
**S/hand or higher noise figure units as available £20 to £30 "**

All fully tested with the local oscillator set to either 9 or 9.1GHz +/- 0.01%

### **GUNNMOD2 GUNN DIODE ATV. TRANSMITTER KIT.**

Gunnmod 2 PCB. forms the heart of a compact, fully featured FM. Gunn diode PAL. SECAM. or NTSC. ATV. transmitter with 5.5, 6.0 or 6.5MHz intercarrier sound. The PCB. is suitable for most types of 3CMs and other frequency Gunn oscillators up to 25mW. (300mW with modification)

Equipped with a suitable antenna and RX. L.O.S. transmissions in excess of 100Km are to be expected.



#### **3CMs TRANSMITTER SYSTEM**

The single 3" by 2" quality PCB. incorporates a stable adjustable Gunn diode, modulator with video pre-emphasis and adjustable deviation, a stable intercarrier sound generator with selectable pre-emphasis, audio limiting, input level control and output filtering.

The PCB. requires a single 10 - 15V DC unregulated supply and consumes only 20mA, excluding the Gunn diode. This makes it ideal for portable or mast head use.

**PCB. with full instructions. You supply components, Gunn osc. case, connectors etc. £5.50**

**PCB. kit with full instructions. You supply Gunn osc. case, connectors ect.**

**(Note 1) £20**

**PCB. kit with Gunn oscillator. You supply case connectors etc. (Note 1 & 2) £30**

Prices are all inclusive.

Note 1. Please state 5.5MHz. 6.0MHz or 6.5MHz audio subcarrier frequency. (6MHz standard)

Note 2. At present Gunn oscillators are good tested surplus units. Supply is limited. Please contact before ordering. Gunn oscillators are pre-tuned to 10.278GHz. Other frequencies at request.

For assembled and tested units, please contact.

## FEED HORNS

Small Alloy feed horns 30° X 60° beamwidth. Ideal for offset dishes **£1.25 Inclusive**

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**Bob Platts G8OZP**

**0/0 01283 531443**

**220 Rolleston Road  
Burton upon Trent  
STAFFS  
DE13 0AY**

Please make cheques  
payable to Bob Platts

**7PM to 9PM preferred**

**For Sale:** I.B.A. Yearbooks 1973 '75, '76, '77, '78, '79, 85, '87, £6.50 each, Inside BBC Television 1983, £7.50, Images of Success - The history of Vintens £10.00, BBC Training Manual - Editing Film & Videotape £5.00, Sony BVE 910 Ops manual £12.00 Panasonic AG 7750/7650/800, WJ- MX50/KB50 Ops manual bound photocopy set £5.00, Video Machine v 1.2 Ops manual set £7.50, Local Television - Finding a voice £7.00. All prices inc p&p. Happy to swap any/all items for Waveform/Vectorscope, 20 Mhz scope or Colour Bar gen, condition not important. Nigel Phillips. 80 Johnston Road, Oakdale, Pool, Dorset. BH15 3HT. Tel 01202 670733

**For Sale:** Tektronix T935A Portable 'scope. Good Condition. 240V in 35Mhz dual trace with delayed sweep. 2mV - 10V/div 0.5s - 10ns/div. £85.

Home-brew HF Linear Valve Amp (160 - 10m) 2 x 4CX250B Final. Based on Sep '74 Radcom design. Aerial change-over relay and rectifier valve need replacement, hence £50. HEAVY! Buyer must collect.

Bearcat SX200N. Scanning monitor Rx for 26-88, 108-180 and 380-514mhz. 16 channels AM or NBFM. 12v dc input with operator and service manuals. PLL requires attention, hence £40.

Hewlett Packard 19" rack mountable, fan blown, 240v in DC Linear PSU with DC sense input. 0-40v @ 30A. Large V and I meters. Control system requires some attention, hence £30. HEAVY! Buyer must collect.

Amstrad MC2400. PC Internal Modem. AT bus - BT line jack output. Speeds up to V24.bis. including handbook and Mirror-II comms software (on 5.25"). £25.

RTTY terminal unit BARTG type ST5MC. 170 and 425Hz shifts with TTL interface. ZX-Spectrum serial to parallel interface card available. Will also interface directly with 80V Teleprinter machines. £15.

PYE Olympiac dashboard mount VHF (low-band) AM mobile transceiver. With mic and speaker. £15.

PYE R200 series single channel base station UHF FM Tx and Rx units; two in 4U 19" cases with internal mains PSU and link cable. £10. Will re-tune with crystals onto 70cm.

Ex-equipment Farnell G6-5M. 240V in, Eurocard size SMPSUs. Fully enclosed. 4-6V output @ 5A. Good for powering TTL, CMOS, etc. £5. Original price over £100!

Contact Bob Copeland G4PDF on 01673 857420 (Lincs).

**Books For Sale:** 'Essentials of Electricity For Radio and Television'. Slurtzberg and Osterheld. Pub. McGraw Hill 1950. Illustrated. No d/w £5.

'Fundamental Electronics and Vacuum Tubes'. Arthur Lemuel Albert. Pub.

Macmillan and Co. N.Y. 1947. No d/w. Ex Sunderland Tech College Library. £3.

'Radio and Television Test Instruments' Hugo Gernsback. 1955. Illustrated. Large paperback style. £3.

'Basic Television' A.Schure. Pub. John F. Rider Inc N.Y. 1963. 5 parts. Many illustrations. (all line drawings) 5th ed. Large paperback style. £5.

'TV and Radio Tube Troubles'. Sol Heller. Gernsback Library No.68.1958. pb £3.

IBA Technical Review (no. 2) Technical Reference Book. 1977. £3.

IBA Technical Review. (no 10) A Broadcasting Engineer's Vade Mecum. May 1978. £3.

ITV 1982. £5.

WORLD RADIO AND TV HANDBOOK. 1973. 1975. £3 each.

The Blue Peter Book of Television. £2.

All books clean and in vgc. Postage £1 per book. Contact Dicky Howett

01245 441811 or write 23 Micawber Way, Chelmsford, Essex

CM1 4UG.

**For Sale:** Teletext creating terminal - compact excellent Softel SE3010 £35.

Audio/Video modulator SVT.MD2.1U 19" Channel 43 £15. Sony tuner TU1100UB

Audio/Video out £45. Switchpanel - Audio/Video IU 19" rackmount £5.

Resistance and Capacitance substitution boxes by Hatfield pocket size £8 each. SDW

pocket video delay line - adjustable £8. Motorola w/t charger tester £5. For A

video pointer VP380 joystick circles arrows etc as new £80. Pye Xtal marker pocket

size on 23.5 Mhz £5. Drake talkback panel as new with AKG 510B on gooseneck

£25. All O.N.O. Contact Piers Bedford on 0181 747 0069.

**For Sale:** 24cm ATV transceiver consisting: IW Solent TX, 4W LMW Linear,

Wood & Douglas RX modules, seq. logic (CQTV-125), boxed, £175. Cropredy style

colour test card generator with 16 customised test patterns, £45. 70cm 0.5W AM

TV TX, W&D module, boxed £30 ono. Fortop 70cm to UHF RX converter £20.

ROBOT 400 SSTV clone, working £50 ono. TANDY 1400 FD laptop PC, manuals

etc £125 or £150 with Packet Modem. Mpalin/Ramsey style PC Packet Modem,

cables etc £35. Crofton 9" b + w video monitor £30. SHARP MZ80A computer,

Z80 based, assembler etc, £25 ono. Willing to swap 24cm TX/Rx for IC202S or

FT290R. Buyer to collect / inspect or pay carriage. Contact Bob G8VOI

(Waterlooville, Hants)

on 01705 250830 after 6pm.

**For Sale:** ROBOT 400 SSTV TX/RX Homebrew £80. G3WCY COLOUR SSTV RX ONLY £45. MONO CCTV CAMERA TYPE VC900 £40. AMIGA 1MEG Dual disk drive plus monitor plinth manuals S/W etc £65. COLOUR/RGB monitor for above £50. PRINTER Dot matrix Type MT150 for above Amiga Manual/cables £35. BBC micro Plus disk drive manuals S/W and plinth £35. Colour/RGB monitor for above £40. HF Beam Type TH3MK3 10/15/20 Metres £70. YAESU ATU Type FC301 and manual £50. YAESU Scanning VFO Type FV901DM (Digital) Manual £70. TELEQUIPMENT Oscilloscope Type D61A £50. Contact: Brian Smith G3WCY 20A Bessingby Road, Ruislip, Middx HA4 9DA Phone Daytime 01276 685385 ext 2013 or Evenings After 6.30 on 018956 - 77017.

**For Sale:** CQ-TV Mixer boards, (complete set) most of them constructed and complete plus paperwork but untested. PAL coder complete, untested. EDDISTONE A.M. RADIO, MODAL 840A in full working order. WATFORD ELECTRONICS U.V. EPROM ERASER (AS NEW) PLUS SPARE TUBE, SPONGE. Offers are required for the above. Buyer to collect. G7GNA L.W. Smith 79 Laburnum Road, Waterlooville, Portsmouth, Hants PO7 7AU on 01705 792284.

**For Sale:** MICROWAVE MODULES EQUIPMENT MTV 435 TV TRANSMITTER in good condition £75. ono. MMD 500 DIGITAL FREQUENCY METER £35. YAESU FT41 70cms HANDHELD TRANSCEIVER in as new condition £220. Contact John 01253 594381.

**For Sale:** SCOPES, H/KIT -10-18U. SOLARTRON CD 1016. £30 each. Contact D. A. Griggs 5 Collingwood Avenue, Muswell Hill, London N10 3EH

**For Sale:** Two JVC S100E COLOUR VIDEO CAMERAS, genlock unit, video/audio mixer extension cable two PSU's £250. COMPUTER PRINTER BROTHER M1009 Dot matrix spare ribbon £50. Evesham 01386 830863.

**For Sale:** Sony V04800PS portable U-matic in leatherette case with mains power supply and a box of ten tapes, seems to be in working order £75. Memory board for IBM At with 6 megs ram no details £30.. Large quantity of Commodore 5.25" disks with assorted system and diagnostic software for various machines £15.00..

SuperStor program for seagate hard drives, book and disk + Quickindex for Dbase book and disk£5.00.. 6 Phillips EL 8111 11" mono monitors in working order with circuit, these are ex my OB van and will be available next year £90 the lot..

Marconi Mk9 camera head in poor condition for spares £20.00 .. Marconi MK8 Broadcast studio colour camera, complete but will need some work, £150.00 ..

Spares available for Marconi Mk 8 & Mk9's + LDK5's and some extenders for this and that. Glass BBC test transparency

No. 52 (12" \* 10" test slide) Swap for something of equal interest.

.. TV lens, the sort you used to hang in front of your 1952 tele to make the pictures bigger offers .. ZNA134 SPG Chip ex equipment

£5.00 ..Thorn WG71/GE5M/501 SPG, potentially triple standard(405,525,625) circa 1965? will need fixing £15.00 . 200 watt dummy load with meter to read 200 or 20 watts. ok on 70cms and probably ok on 24 cms Ex military robust construction £15  
SPC Laser printer books consumables etc. £60 Pair of ITT Starphones complete kit with batteries, charger, testjig, spares H/book, working on 432.475Mhz simplex £50.  
EMI 2001 studio camera 4 tube, somewhat big and heavy O/wise clean and tidy with Zoom lens, cables, lens hood spares. Electro-craft Genlock SPG, outputs, syncs, line drive, field drive, pal switch, burst gate, blanking, no subcarrier output, small modern(ish) item. Sony video disk recorder?? SVM1110 a smallish monitor with a disk underneath, some sort of slow motion analyser? Luxor S-VHS to RGB converter, modern unit in small case with controls, scart plug, circuit, unused £25.  
Some unused spare boards for marconi Mk5 SPG's. If it does not go into the post box its collect only. B. Summers G8GQS 0189 5810144 Mobile 0850 014892.

## WANTED

**Wanted:** To complete restoration of NEC 100 camera; A pal encoder board No.11 and a suitable lens. A scrap camera or any other bits would also be most welcome. Bosch KCN portable camera circa 1975 to match the CCU I have already got. A Marconi MKIII camera or parts to make my incomplete camera whole again, any bits most welcome.

A Circuit for Cossor Scope CD130. A Co-processor for a 80286 and some memory in 30 pin format? VPR5 portable video recorder. B. Summers G8GQS 01895 810144/0850 014892

**Wanted:** The following back issues of CQ-TV to complete my collection: 1 ... 93, 95 ... 117, 119, 142, 156 & 157. Either the originals if anyone has spares or borrow, so I can photocopy. All expenses covered. Contact Chris Smith G1FEF, 19 Spital Terrace, Gainsborough, Lincolnshire DN21 2HD. Tel/Fax: 01427 614788, Mobile: 0589 631104

**Wanted:** Philips Colour Video monitor 9" or one similar with a smaller screen, working and in good condition. Colour bar pattern generator with PAL output. Contact Bob Copeland G4PDF on 01673 857420 (Lincs).

**Wanted:** Dallmeyer 'Super Six' 4" f1.9 lens. Other lenses required: Watson, Taylor Hobson in any condition for Turret Image Orthicon cameras. (ie fixed focus). Also required any old books/brochures on (guess what) Television (technical or otherwise). Contact Dicky Howett 01245 441811 or write 23 Micawber Way Chelmsford Essex CM1 4UG.

**Wanted:** Grundig 2 x 4 super or similar V2000 machine in good working order. Buy, rent or borrow. If you can help please contact Wyn Fieldson on 01923 776792 (Rickmansworth Herts)

**Wanted:** Motorola P210 walkietalkies - any condition John Logie Baird letters etc. contact Piers Bedford 0181 747 0069