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Repeater Liaison: - General enquiries and repeater affiliation. Graham Hankins G8EMX, 11 Cottesbrook Road, Acocks Green, Birmingham, B27 6LE. Tel: 0121 707 4337.

BATC web master

Anything to do with the BATCs web site. E-mail: webmaster@batc.org.uk

Well we have overcome the first hurdle and produced the first ever A4 CQ-TV and what a magazine, I have had nothing but compliments, why I am not sure as Ian did all the work. Amongst the emails and letters are some that admit they were in favour of staying A5, but would now like to go on record as saying they prefer the A4 magazine. What so good about it, well everyone has their own opinion, what I personally like is the ability to mix pictures diagrams and text on a single page I think it attracts the attention. CQ-TV has been evolving slowly over the years. The page count has increased until we reached the limit of the stapling machines. The covers changed to art paper in order to support colour printing, and colour inserts were also used, but this is a major format change and we have now joined all the other ATV magazines in a common page size.

There have been problems, the dispatch department, Jill and Paul Marshall who press-stream the envelopes into over 120 different bags according to post code and add subscription reminders where necessary, lost a bigger part of their house as 41 boxes of CQ-TV arrived on their door step.

The treasurer noticed the extra £600 pounds on the printing bill, which is due to the extra pages not the size change, this was a 56 page issue or 112 A5 pages if we had kept the old format. The postage has gone up, but at the time of writing I don't think the bill has reached him yet, if it has, he is keeping unusually quiet. Will this affect subscriptions, yes and no, the subscription rate of £12 has not been covering running costs for some time, fortunately we have reserves. The subscriptions would have had to be raised, for the year 2000 even if we stayed A5. This is partly due to rising costs and partly due to other enterprises that used to make money and off set things.

An example is the BATC rally in April, its getting harder to attract traders, this problem is part of the declining rally scene in general. At the time of going to press our Rally is still on the books, but if you are a trader or are in contact with traders we would value support.

The sale of BATC handbooks was also another source of income. I know what we have in stock is old, but as sales have dropped over the years we have been a little reluctant to produce a new book. The only income that seems to elude us is CQ-TV advertising, other ATV magazines carry more ads for TV related hardware. We are trying to attract this revenue and at the same time let you benefit from knowing about these products. CQ-TV 185 carried some very competitive advertising rates, which together with the new format, should help attract this revenue.

The BATC CD is selling but perhaps not as fast as we thought. I hope this becomes a valuable archive as more magazines are added to it. I would like to see all the back copies of CQ-TV archived in this way, going back to issue one, but the problem is converting them from paper. They have first to be scanned, to produce large bit map files, and then converted with optical character recognition software to smaller manageable files, that can be word searched, by the index. This process often requires that each page is checked against the written text and corrected by hand. Ian again has done a lot of this, but the magazine and web site work mean it has come to a halt. If anyone would like to take up the challenge then contact Ian and let him know which magazine you are working on to avoid duplication of effort and perhaps we can add some more back issues to our CD.

Shuttleworth 99 our centenary celebration is getting nearer, sorry it had to be in August, I know this has clashed with the family holiday for quite a number of you, but that was the only date available for this venue. I hope we can make it an event to remember. It is the only real place we all meet, we have tried adding talks and discussions to the rally, but everyone is always too busy chasing a bargain. I had hoped that Karen Scott of the RA would be able to attend and explain from the RA side of things how repeater licences are dealt with and some of the ways we can speed this process up. I know we all would like to know how long a repeater application takes to be processed at the RA, and



how much time is used up by other links in the chain. Unfortunately Karen cannot make this date.

The club website has had a recent make over and is attracting in the order of 80000 hits a month, and proving a valuable source of feedback from readers. Past issues of the CQTV are available here for those who surf these sites to see what we are all about. The latest Magazine however is not available, 185 will go there when 186 is on your door mat, in this way we preserve the advantage of being a paying member of the club and still enable prospective members to see what we are about. We do get new members via the site and their numbers are growing. I have included in this issue instructions, for getting onto the Internet and visiting the site, I am sorry that this article is only applicable to UK readers.

Dave Lawton has also been on the warpath with his subscription reminder hat on. We now operate a rolling subscription; so your subs could fall due at any time although most of you for historic reasons will need to renew in the New Year in order to get the first magazine of the year. About 400 of you did not, and despite this we sent you CQ-TV 185. From this point on we will be tightening our belt, and if you do not pay you will not receive the next magazine, sorry but we do have a duty to manage club funds for the benefit of all the members.

I hope to see you all at Shuttleworth 99, see the next CQ-TV for a full list of the events and demonstrations.

Trevor Brown, BATC Chairman.

Sunday April 25th

SPORTS CONNEXION COVENTRY

Doors open at 10.00 (09.30 for disabled)

Entrance £1.50 & £1.00p for OAP and under 14s

All the usual features of BATC rallies: over 200 trading tables, Bring & Buy, large outdoor flea market, specialist more television displays, ex broadcast vehicles, etc.

GB6ATV talk in on S22 and GB3CV (RB9)

Full refreshment facilities - licensed bar.

All enquiries: Mike Wooding G6IQM

Tel: 01788 890365 Fax: 01788 891883

email: rally99@batc.org.uk

The Location

The **Sports Connexion** lies approximately 3 miles south of Coventry city centre and is at the junction of the A445 and the A423, the full address is: **Sports Connexion, Leamington Road, Ryton-on-Dunsmore, Nr. Coventry**. It is within easy reach of the M1, M6, M40, M42 and M45. The major road links to and from Coventry and bypasses around the city make the location very easy to get to.

For those who wish overnight accommodation in the area the nearest hotel/motel is the Courtyard by Marriott (01203 301585) which is approximately 2 miles from the venue and is located at the junction of the A45 and the A445.

For those who wish to camp or caravan, as usual the site at the Bull and Butcher

(01203 301400) on the A445 1 mile south of the venue is ideal. The pub does excellent meals too - maybe I shall see you there on Saturday night - mine's a pint of Kilkenny's.

Coventry Amateur Radio Society will be providing the talk-in station again on S22 and GB3CV (RB9) using the special callsign GB6ATV. Many thanks to the GB3CV repeater group for allowing us to use the repeater again for this purpose.

There will be a specialist area available in the Banbury Room (adjacent the bar) for anyone wishing to display ATV equipment. If you wish to do this please contact me as shown below to book a table, these are free of charge and only available to members, trading from them will not be permitted. Other specialist groups may also have displays in this area.

Finally, as ever, the usual plea for help. I have to admit that to some extent it actually worked last year! I shall be on site on Saturday from around 1500 setting up the hall and from 0630 on Sunday morning. If you can spare an hour or two on either day please come and help.

If you can help on Saturday please telephone me during the previous week or on my mobile on the Saturday, to confirm the time we can have access to the hall. Thanks in advance!

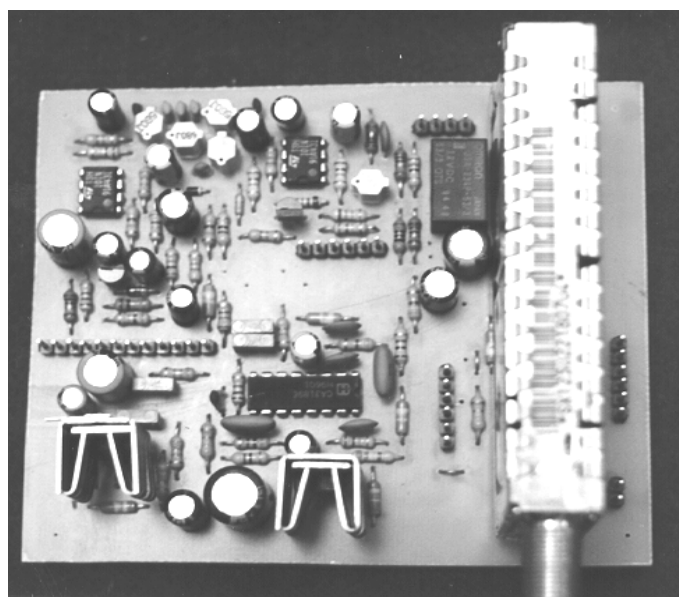
OK that's it. I hope to see you ALL there. Please come and make yourself known to me and the rest of the Committee.

73 ... Mike

Tel: 01788 890365; Fax: 01788 891883; Mobile: 0468 925351; email: rally99@batc.org.uk

GB3XT KITS & BITS

NEW DOVE TUNEABLE IF / RX KIT.



The Dove ATV Tuneable IF/ RX. forms the ideal heart of an ATV receiving system for either 24CMs (pre-amp recommended) or the higher bands when used in conjunction with a suitable Low Noise Block converter.

The flexible design concept allows for expansion to suit your needs for now and the future.

Easy to construct requiring no adjustment, setting up or alignment. The kit contains all board mounted components and full instructions.

Brief spec. Size.105mm wide x 97mm deep x 50mm high. Power. 12vDC @ 400mA. Frequency range. 925MHz - 1800MHz. Audio subcarrier. 6MHz. Video bandwidth. Variable.

Video outputs. 1v PK/PK + Base band. Audio output. 1.5Watts. Controls. (all 10K pots) Main tuning, Volume, Video gain, Video bandwidth. LNB power on/off switch.

DOVE RECEIVER KIT £42.00 all-inclusive.

GUNNMOD2 3CMs ATV. TX. kit. Very popular full feature Gunn diode TX. Complete with pre-tuned oscillator head. £30.00. PCB. kit less oscillator head £20.00

3CMs LNB's. All with 9GHz Local oscillators. New 0.7db nf. with dish feed horn. £43.00. With 22mm circular W/G input £45.00. Others and second hand units available. Please contact.

WG16 to 22mm Circular transition. Converts 22mm circular to WG16 and vica verca.

24CMs LOW NOISE HIGH GAIN GASFET PRE-AMP kit. 40db gain 1db NF. band pass helical filtering. 12-18vDC feed via co-ax. Designed specifically for ATV. but good for all modes £60.00

DTMF DECODER kit. Very high quality decoder IC. All o/p's buffered. Will directly drive TTL/CMOS or relays. Can be used to control whatever your imagination thinks of. £12.00

Prices are all inclusive of P&P etc. (+ 10% abroad) PCB's are available assembled and tested at extra charge. **SAE. (to take A4 paper) for further details or call.**

Orders and enquiries to:- BOB PLATTS G8OZP. 220 ROLLESTON ROAD. BURTON UPON TRENT. STAFFS. DE13 0AY. PHONE 01283 531443 7 - 9PM WEEKDAYS PLEASE

CQ-TV Commercial advertising rates



Size	Mono	Colour
Quarter page	£20	£25
Half page	£40	£50
Full page	£80	£100



Discounts of 5% for 2-3 insertions and 10% for 4 and above apply to the above prices.

If you would like to advertise in CQ-TV, then please contact our advertising manager, Chris Smith (G1FEF), 25 Dando Close, Wollaston, Northants, NN29 7QB. Email: adman@batc.org.uk

TV on the Air

By Graham Hankins G8EMX.

The Leicester Repeater Group sent me a copy of its February 99 newsletter 'LENS' and the front page carried notice of an Open Meeting on 18 February. As I was working in Coventry anyway I took a trip up the M69 to ask about their ATV repeater GB3GV.

The meeting commenced shortly after 8pm, by which time I had counted around thirty people in the room. The chairman John G7RXXS had distributed an agenda, so I took particular note of the Engineering Report. Engineering Manager David G7WHI/M0BKH told the meeting that there had been very few problems with their voice repeaters 'LE', 'CF' and 'UM' but made no specific mention of 'GV'.

David commented that the repeater site gave more concerns than the repeaters' electronics! Problems of water ingress, temperature, alarms and a horse (yes, a horse) had all made site visits necessary in recent months and the Group had achieved remarkable results – and cost savings – by installing a different alarm, a more efficient heating system, a stronger fence and a new water pump.

But my interest was the 24cm ATV repeater GB3GV, so in Any Other Business I asked for a 'show of hands' count of how many in the room had any ATV gear to access the repeater. There were none, apart from David G8OBP who looked after 'GV' anyway. I was

told that, within the Group membership of more than 50, around 10% made occasional use of 'GV'.

Being a 'nosey' *** I decided to delve further by seeking for any reasons WHY nobody present at the meeting used the TV facility. Cost was inevitably mentioned then, surprisingly, 'lack of information/knowledge'. I was invited to write something on ATV for the 'LENS' newsletter. 'LENS' has certainly carried info on 'GV', thanks to David G8OBP, but I can no doubt send something in to the Group.

I have had a phone call and letter from Doug Pitt in Nottingham (the back of Doug's head was in the 'Picture Gallery' in CQ-TV 185!) Doug is a member of the Narrow Bandwidth Television Association and writes: "I would be glad to hear from anyone with functional 70cm ATV equipment, living within around 20 miles of Nottingham. The purpose would be to carry out some interesting and possibly fruitful experiments with NBTV on the 435MHz band". Doug does not quote his callsign, but gives his phone number as 0115 9282896. His address is 1, Burnwood Drive, Wollaton, Nottingham, NG8 2DJ.

Staying with 70cm ATV, I would like to find out, for TVOA, how ATV operators are using ATV on 70cm in addition to the microwave bands.. I know that there are stations with 70cm



ATV locally in the West Midlands, but it would be most useful to know of other 70cm ATV activity around the country. Please contact me with any information.

Finally, back to 24cm and Graham Shirville G3VZV reports via E-mail that 24cm ATV repeater GB3EN at Enfield, to the north of central London, was cleared for the issue of the Notice of Variation on February 10. The site is very close to the Picketts Lock Leisure and Exhibition Centre, and John Douglas of the North London Television Group will be part of the Lecture Stream over the weekend March 13/14. Well done to John and the NLTG team.

Responding to our editor's E-mail, I was told "about a page, Graham." Well, this is about a page on my screen, so here it comes as an E-mail attachment, Ian!

73 and P5 from Graham G8EMX.

Deadline



Will all contributors please note that the deadline for articles for CQ-TV 187 is June 18th 1999. Please send your contributions in as soon as you can *prior* to this date.

If you would like to contribute an article for publication in CQ-TV, then please send it to the editor, either by post, or preferably by email. If you don't use a word processor, plain ASCII text is fine. Please see page 2 for address details.

Will all prospective contributors please be sure to read the 'Notice to Contributors' on page 1 so that you understand the implications of submitting an article for publication.

The CQ-TV A4 size Word 97 document template can be downloaded from our web site. Select the CQ-TV magazine link from the home page at <http://www.batc.org.uk>

All adverts, both members and commercial, should be sent to Chris Smith, the advertising manager, at 25 Dando Close, Wollaston, Northants, NN29 7QB.

Email: adman@batc.org.uk by no later than the 12th June 1999.

Experimenting with Video - part 3

This article first appeared in ETI magazine, Volume 26 No. 3, April 1997. ED

In the last issue we looked at the circuit diagram and the software operation of the video mixer/fader. This issue we will look at the operation of the signals in the circuit in a little more detail, the construction, testing and setup of the mixer/fader, and the control of the fader over the serial link.

PIC to switch the video signal directly on or off. It is used in the vertical wipe patterns. When the SWINVERT signal is low, then the SWDIRECT signal is low to turn the video signal on, and high to turn it off. The SWDIRECT signal is wire OR'd with the outputs of the

horizontal comparators, and therefore should be controlled with the TRIS registers of the PIC, effectively operating the output of the PIC as an open drain signal. The SWDIRECT signal is driven from port B of the PIC, which has its internal pull-ups enabled.

SWINVERT: This signal inverts the outputs of the horizontal comparators and the SWDIRECT signal when set high. This is used in some effects to reverse the direction of the fade or wipe.

SWRISE and SWFALL: These signals control the horizontal comparator outputs. The horizontal comparators have open collector outputs, and are connected to the video switch output by analogue switches. For simple horizontal wipes (pattern numbers 4 and 5) only the SWRISE signal is enabled. For horizontal wipes with vertical bars (such as pattern 10), both the SWRISE and SWFALL signals are enabled.

For horizontal wipes, the PWM output (PWM1 on Port C2) must vary to change the position across the line at

PATTERN	SWDIRECT			SWRISE		SWFALL		SWINVERT		START FADE	END FADE
	SWDIRECT	SWRISE	SWFALL	SWRISE	SWFALL	SWINVERT	SWINVERT				
	1	SWITCH VIDEO	0	0	0	DOWN: 0	DOWN: 312				
	2	SWITCH VIDEO	0	0	0	DOWN: 312	DOWN: 0				
	3	SWITCH VIDEO	1	1	1	SEE 7 & 9	SEE 7 & 9				
	4	HIGH IMPEDANCE	1	0	1	SLIDEVOLT +5V	SLIDEVOLT 0V				
	5	HIGH IMPEDANCE	1	0	0	SLIDEVOLT 0V	SLIDEVOLT +5V				
	6	SWITCH VIDEO	1	1	0	SEE 7 & 9	SEE 7 & 9				
	7	0	0	0	0	VGAIN +5V	VGAIN 0V				
	8	SWITCH VIDEO	0	0	0	DOWN: 0	DOWN: 156	GAP: 312	GAP: 0		
	9	SWITCH VIDEO	0	0	0	DOWN: 156	DOWN: 0	GAP: 0	GAP: 312		
	10	HIGH IMPEDANCE	1	1	1	SLIDEVOLT +5V	SLIDEVOLT +2.5V				
	11	HIGH IMPEDANCE	1	1	0	SLIDEVOLT +2.5V	SLIDEVOLT +5V				
	12	SWITCH VIDEO	0	0	0	SWITCH: 0	SWITCH: 1				

Figure 1: Signal setting for fader and mixer patterns

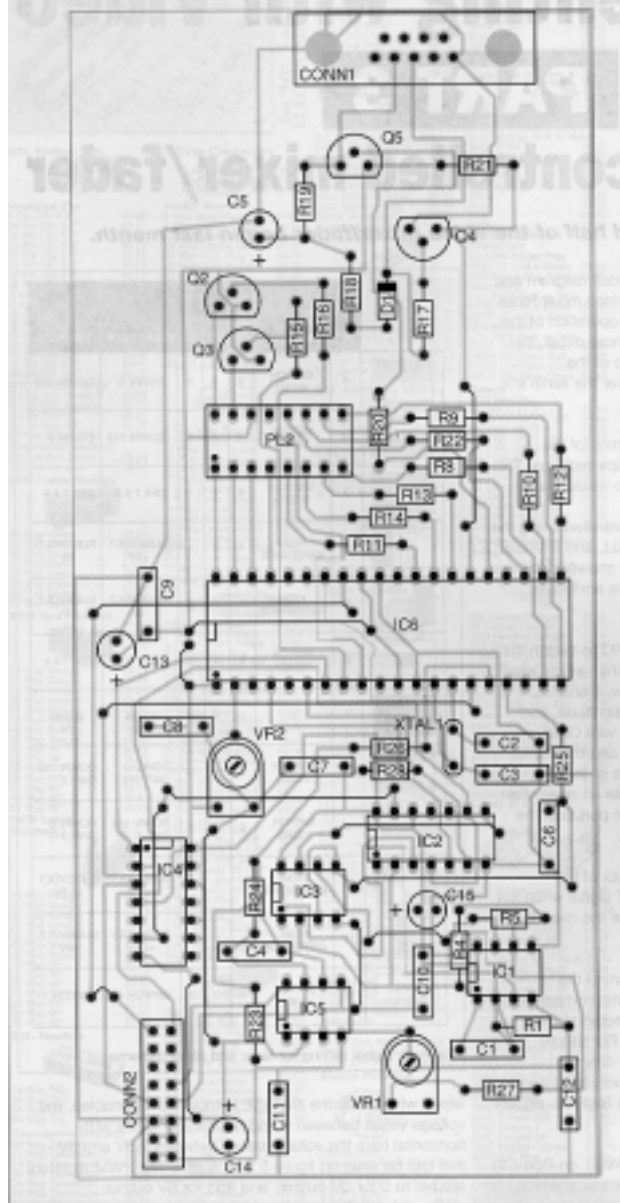
Detailed pattern generation

We will look in a little more detail at the setting of the signals around the circuit for the various wipe patterns. This information is of use for experimenters who would like to extend the operation of the circuit.

The majority of the slide patterns are controlled using the four signals SWINVERT, SWDIRECT, SWFALL and SWRISE as labelled on figure 3 (the circuit diagram) shown in the first half of this project last time. These signals are set as follows:

SWDIRECT: This signal is used by the

Figure 2: the component layout and links on the main PCB



which the comparators switch. This signal (SLIDEVOLT) is on pin 17 of the PIC circuit diagram shown in part two. For simple wipes where only the SWRISE comparator is enabled, the voltage varies between 0 and 5V. For the wipes with horizontal bars the voltage varies between 2.5V and 5V - this can be seen on figure 5 of part two. The PWM registers are set to 0 for 0V output, and 255 for 5V output.

For video fades the signal is enabled using SWDIRECT however, the second PWM output on PIC port RC1 (pin 16) is used to generate a fade voltage between 0 and 5V. This is shown as VGAIN on the circuit diagram. When the PWM output is at 5V then the fade

voltage is set to -0.5V and the video signal is set to full on. When the PWM output is at 0V the fade voltage is set to +0.5V and the video signal is full off.

Figure 1 shows the setting of the various signals in the circuit for each pattern. The columns labelled Start Fade and End Fade show the state of the voltages in the circuit at the start and end of the fade or wipe. For the horizontal effects, these columns show the state of internal variables in the program, which control the horizontal fade. The source code for the program (which is available in magnetic form - see the end of this article) uses these variables, and should be consulted to see how they are used.

Construction

The sync separator board featured in the first article in this series in CQ-TV issue 179 (August 1997) should be constructed as shown in that article. However, one important change must be made: the 78L05 device must be changed to a 7805 device, as the total current consumption on the +5V rail rises to about 200mA. The tab of the 7805 should be towards the input of the board. A heatsink should be fitted.

There are two boards to build for the mixer/fader: the first is the main video mixer/fader, the second is the keypad and display board. The board component overlay for the main board is shown in figure 2. The board is single sided, and there are 14 wire links. If no serial control from a PC is required, then the components connected to pins 25 and 26 of the PIC may be left out.

Construction is straightforward. Use sockets for all the ICs on the board. Start with the wire links, then insert all the IC sockets, resistors, capacitors, and finally the remaining components. Finish with the connectors.

For testing purposes, the variable resistor VR2 can be wired up directly, or can be temporarily replaced with a

preset. Do not be tempted to increase the value of this resistor, as it drives a relatively low impedance input on the PIC. Initially set VR1 to the centre position.

devices, which should also be socketed to raise them from the board.

The connections between the boards use IDC connectors and 16-way ribbon cables. The connection to the sync separator board uses 16-way IDC connectors on a 0.1 in pitch, and the connection between the main board and the display board uses 16-pin DIL connectors. Keep the cable between the main board and the sync separator board as short as possible. The 16-way IDC connectors on a 0.1 in pitch may be attached to the cable by assembling the connector around the cable, and then gently squeezing the connector on to the cable using a vice. The DIL connector may be assembled on to the cable, and plugged in to a scrap socket soldered to a small piece of veroboard, the whole then being squeezed together using a vice and then removed from the scrap socket.

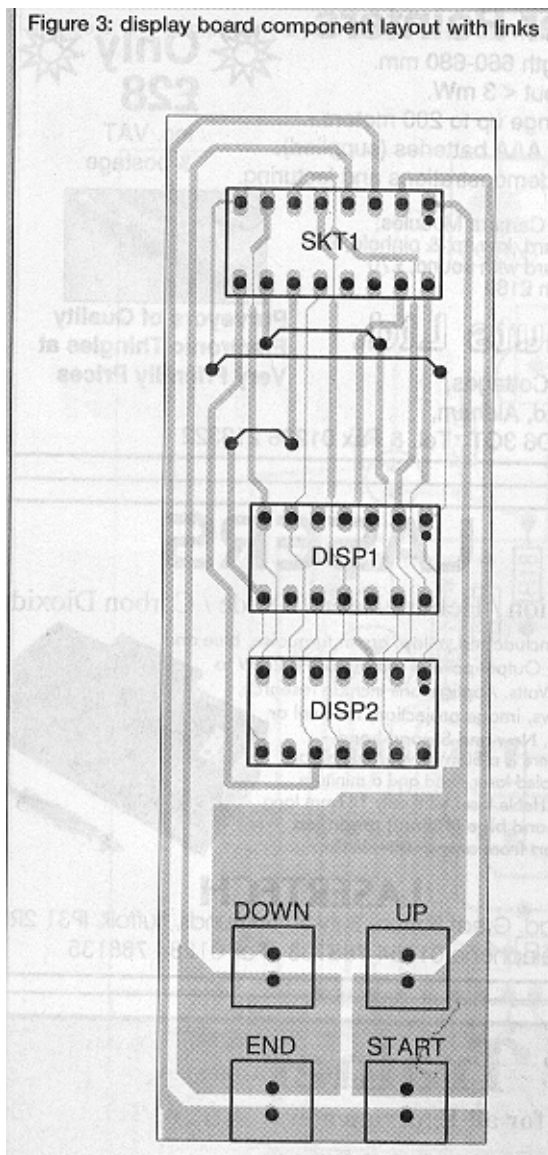
The mechanical construction of the project depends on the power supply to be used. The layout is not critical and the case does not need screening. The only external cut-outs required are for connectors, and for the push buttons and display. The display should be mounted behind a red filter, and the display board can be mounted using the fixing nuts and washers for the push buttons.

The power supply

The power supply should be greater than +/- 9V and capable of driving at least +250mA and -100mA. A simple 500mA, +/- 12V transformer in the circuit shown in figure 4 is adequate for this project.

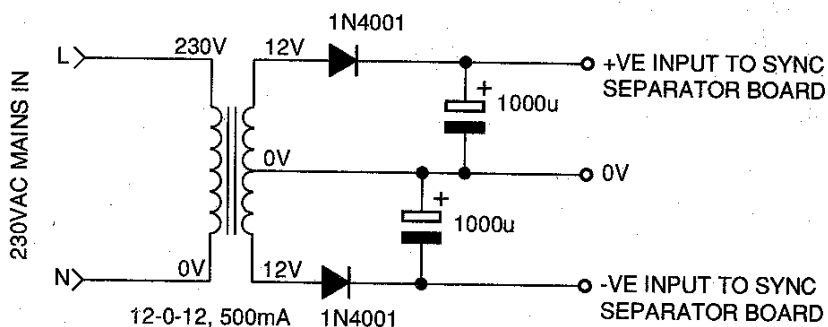
Testing

Connect the three boards together, and



The keypad and display board, shown in figure 3, is also straightforward. There are three wire links on this board. The push buttons are miniature types on a 0.1in pitch. The displays are 0.3in

Figure 4: the video mixer/fader power supply



connect a power supply to the sync separator board, which should have been set up as described in part one. Check that the power supply to the ICs on the main board is correct, then power down and insert the ICs and displays into the two boards. Power up again. If all is well, the displays should be showing 01. Connect a video signal and a monitor to the sync separator board and the two decimal points should come on, showing the presence of a video signal with synchronisation signals being detected successfully.

Check that the mixer/fader operates successfully as shown in part two (under "Operation of mixer"). The only adjustment, which needs to be made, is VR1. Select pattern 9, and set VR2 to slowest fade speed. Start the fade, and press either of the UP/DOWN buttons again to stop the fade; adjust VR1 until the fade bars are symmetrical on the video monitor.

NUMERIC CODES	ASCII CHARACTER	EFFECT ON MIXER FADER
43	'+'	PAUSE CURRENT FADE/WIPE
48 - 57	'0' - '9'	SET FADE SPEED FOR FOLLOWING FADES DRIVEN FROM SERIAL INTERFACE, 0 IS FASTEST, 9 IS SLOWEST
65 - 76	'A' - 'L'	START FADE - PATTERNS 1 TO 12
97 - 108	'a' - 'l'	START UNFADE - PATTERNS 1 TO 12

Figure 6: summary of the control codes used by the mixer/fader

and this may be used by a controlling program to determine the sequence of a programmed fade or wipe.

ASCII codes 65 to 76 (Letters 'A' to 'L') start fade patterns 1 to 12. To start a fade or wipe, simply send the ASCII code to the fader/mixer. For example, to start pattern 2 send a 'B' character to the fader/mixer. When the fade/wipe is complete, the fader/mixer will return a 'K' character. ASCII codes 97 to 109 (Letters 'a' to 'l') start an unfade of patterns 1 to 12. Therefore, to fade the

already paused.

Figure 6 is a summary of the control codes used by the fader/mixer. Figure 7 shows the QBASIC commands required to drive a serial port on a PC to drive the fader/mixer.

QBASIC is a DOS program supplied with the MS-DOS and Windows 95 operating systems.

Obtaining parts

A disk containing the source code and Intel hex format file for the compiled code, which is too extensive to publish here, is available for the project from Forest Electronic Developments (FED) at 10 Holmhurst Avenue, Christchurch, Dorset, BH23 5PQ (01425-270191 for credit card sales). The cost of the disk is £5.00 inclusive of post and packing. The source file disk includes a text file describing how to assemble the files on the disk using Microchips assembler or FED's PICDE assembler.

Alternatively, a PIC16C74-04 pre-programmed with the code for the project is available from FED for £15.00.

All the other parts used in the project are available from Maplin or Farnell.

Resistors

All 1 percent tolerance

R1	680k
R2,3	(omitted)
R4,5	100k
R6, R7	(omitted)
R8 to R14,18,22	300R
R15,16,21,24	4k7
R17,26	22k
R19	2k7
R20,28	10k
R23	47k
R25	33k
R27	68k
VR1	100k

QBASIC COMMAND	EFFECT
OPEN "com1:9600,n,8,1,bin,cd0,cs0,ds0,op0,rs" FOR RANDOM AS #1	OPEN COM PORT 1. (REPLACE COM 1 WITH COM 2 TO USE COM PORT 2). ALSO DISABLES ALL HARDWARE PORT OPERATION
PRINT #1;"A";	PRINT CHARACTER 'A' TO THE SERIAL PORT (MUST HAVE BEEN OPENED AS SHOWN IN OPEN COMMAND ABOVE. REPLACE 'A' WITH ANY CHARACTER REQUIRED)
INPUT #1:A\$	READS A CHARACTER FROM THE SERIAL PPORT. THIS COMMAND WILL WAIT UNTIL A CHARACTER IS RECEIVED, AND CAN BE USED TO WAIT UNTIL THE MIXER/FADER SENDS A 'K' CHARACTER AT THE END OF A FADE OR WIPE

Figure 7: QBASIC commands of use with the serial port

PC control of the mixer/fader

The mixer/fader is connected to a PC (or any suitable computer with a three-wire serial port capability). The serial port operates at 9600bps. The cable requires three wires. Connections between the fader/mixer and the computer are shown in figure 5.

The control of the mixer/fader is straightforward, and may be accomplished from a terminal emulator, or from a Basic control program. When the fader/mixer powers up it sends a 'K' character on to the serial interface. The 'K' character is also sent when a fade or wipe is complete,

video picture back in using pattern 2, send character 'b' to the fader/mixer.

To set the speed of the fade, ASCII codes 48 to 57 (characters '0' to '9') are used. Code '0' is the fastest speed and '9' is the slowest. The speed sent to the fader/mixer is used for all future fades which are started from the serial interface. As soon as the keypad is used to start or end a fade, the speed set on VR2 is used again.

Finally, the '+' character will pause a fade in progress when it is received by the fader/mixer, or restart it if it is

MASTER MODULE	PC CONNECTOR TYPE			
	9-WAY FEMALE	9-WAY MALE	25-WAY FEMALE	25-WAY MALE
SERIAL SKT				
2	3	2	3	2
3	2	3	2	3
5	5	5	7	7

Figure 5: the serial interface wiring

VR2 5k pot ceramic resonator

Capacitors

C1 100pF ceramic
C2, 3 22pF ceramic
C4, 6 680nF
C5 100µF 16V electrolytic
C7 to C12 100nF
C13, 15
XTAL1 4MHz crystal or

Semiconductors

IC1, 5 TL082
IC2 74HC4066
IC3 LM393
IC4 74HC86
IC6 PIC 16C74 (see text)
Q1 (omitted)
Q2, 3, 5 BC559
Q4 BC548
D1 1N4148

Miscellaneous

Conn1 9-pin D connector
Conn2 16-way IDC socket
Disp1, 2, 3, 4 7-segment 0.3in displays, common anode
SW1 to SW4 Pushbutton switches, 0.1 in pinout
PL2 16-pin DIL socket
PCBs for main and display boards
6 x appropriately sized IC sockets case as described.

From the Membership Secretary on his soap box

Yes, I know I've said it before but from recent comments from Members, I'm afraid it has to be said again.

What am I talking about, it is early February as I write this and CQ-TV 185 has arrived on the doormat, it is renewal time for a large percentage of members, those who didn't renew when the reminders first went out last November and have had to have a second reminder sent to them. We sent them CQ-TV 185 although their subscription had effectively lapsed.

There are about 2000 Members and from approximately 800 reminders sent out in November only 400 had renewed by CQ-TV 185 posting. From past experience, of the 400 who have had a second reminder over half will renew. In response to a third letter a further quarter will renew.

Yes this is a dig because I have had to go to time and effort to send out a second reminder and probably a third to follow. This costs the Club money not to mention the time and effort involved on my part.

Due to the time scales involved with producing mailing labels, printing CQ-TV and getting the magazine to the post it can be two or three weeks from the mailing labels being produced to CQ-TV arriving at your door. Hence at the bottom of the renewal letter it states....

"if you have renewed recently please ignore this reminder"

But no, I still receive phone calls complaining that they have sent in their subscription but a reminder is still in CQ-TV. What makes it worst is that

some of these phone calls are at what I consider to be an unreasonable hour of the day. In one instance it was 2240 hrs, lucky for them I was at home, if my wife had answered their ears would have still been ringing.

Please remember renew promptly to save the Club the extra time and expense in sending out additional reminders and if you have to phone a Committee member do so at a reasonable time of day.

It has been a discussion topic at recent Committee meeting about sending out magazines to recently lapsed members. In future this will not happen, if you do not renew on time you will NOT receive a magazine.

PC ATV £5.75

PC-ATV is here, a program to generate Testcards on your PC brightens up any transmission.

Written by Robin Stephens author of ATVArtige & Spectrum

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- TV CLOCKS & ARCHIVE PUBLICATIONS

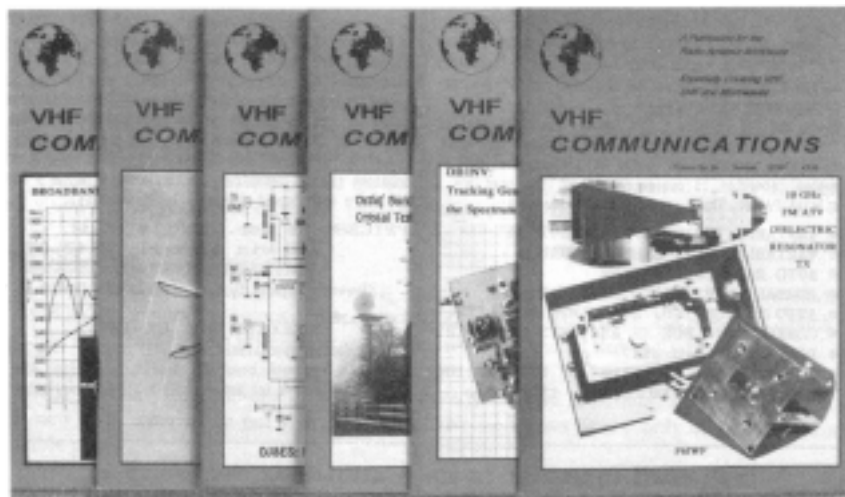
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Email: vhfsubs@vhfcomm.co.uk



The 1997 subscription rate is £18.00 for cash or personal cheque (drawn on a UK bank, or bearing the name of a UK banking agent), postal orders or bankers draft made payable to KM Publications. Payment may also be made by any major credit card at £18.90. The subscription included surface mail charges, airmail is extra at £6.50 per year (£6.85 by credit card). The magazine is a **MUST** for the radio amateur and professional engineer interested in VHF, UHF and Microwave working, containing, as it does, detailed construction articles for equipment operating in these bands.

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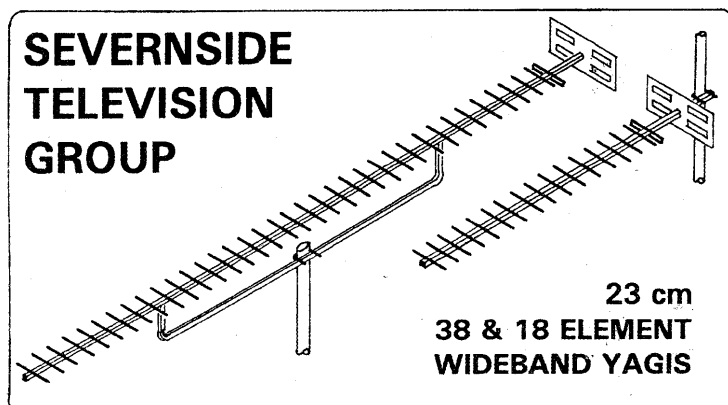
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Satellite TV News

By Paul Holland G3TZO

There is plenty of news to report this time around - but once again the theme is digital. With few exceptions all the real changes and new services are digital. Analogue news is predictably confined to service closures or consolidation to a single analogue feed. The interest now for many in satellite TV reception is building a system capable of catching the literally hundreds of feeds and new broadcast TV services across the satellites visible from the UK. A key component in building a system capable of tracking accurately the many changes going is the home PC. In this edition of Satellite TV News we look at what is happening as the channel count explodes and look briefly at some of the software available to control your system.

New Channels

MTV is due to launch three new 24-hour digital music channels across Europe this summer. The channels are to be called MTV Base, MTV Extra and VH-1 Classic and will launch by July 1 in Sky's digital package. They will later roll out on other analogue and digital platforms throughout Europe.

Welsh channel S4C has confirmed that was due to launch a UK wide service in Sky's digital service on March 1. The channel, which was initially available to digital viewers in Wales only, had intended to start its UK service on February 1 but called it off at the last moment. It will be available for 12 hours a day from noon to midnight.

Transponder News

Insat 2DT at 55E:

DD 18 - Punjab has started on 3,996 L, PAL/clear.

GALS 2 at 36E:

NTV has left 11,835 L (SECAM), now only on Most 1: 12,476 R.

Eutelsat II f3 at 36E:

Europe by Satellite has been on transponder 11.139 GHz h (SR 27500,

FEC 3/4, V-PID 101, A-PID 201). After a short absence, GMD Sankt Augustin is back on 11.050 GHz h (SR 6111, FEC 3/4, V-PID 34, A-PID 35).

Turksat 1B at 31.3E:

Atlas TV has started on 11,176 V, MPEG-2/clear, SR 4285, FEC 5/6.

Arabsat 2B at 30.5E :

ENTV (Algeria) has started on 12,735 V, PAL/clear.

Eutelsat 1f4 at 25,5 E

ITN-feeds can be observed at 11.172 GHz h (SR 5632, FEC 3/4, MPEG2 4:2:2) and 11.187 GHz h (SR 5632, FEC 3/4, V-PID 308, A-PID 256).

Astra 2 A at 28,2 E

S4C is now on transponder 12.129 GHz v (SR 27500, FEC 2/3) scrambled in MPEG2/Videoguard.

Arabsat 2A at 26E:

ENTV (Algeria) has started on 12,536 V, PAL/clear.

Astra 1F at 19.2E:

Canal Canarias has started on 12,246 V, MPEG-2/clear. TV 7 Tunisia has launched in MPEG2 clear on 12.363 GHz v (SR27500, FEC 3/4, V-PID 166, A-PID 128).

Astra 1G at 19.0 E

Sky News can now be found on 12.552 GHz v, MPEG2/clear.

Eutelsat W2 at 16E:

JSC TV Qatar has closed it's service on 11.489 GHz h and is now only on 11.449 GHz h. K-TV (Kurdistan TV) seems to have started a regular service on 11.163 GHz h between 18.00 and 20.00 CET. K-TV is a also carried on INTELSAT 707,10.967 GHz v.

Winchester Teleport has colour bars occasionally on 11.020 GHz h (SR 5632, FEC 3/4). Syria's national

broadcaster has launched a regular service on 11.578 GHz h, sound 6.60 MHz.

Hot Bird 5 at 13E:

Ring TV has left 11,010 H (PAL). Eros TV has ceased its analogue service at Hot Bird 5, 11.623 GHz v (PAL-D2 MAC/Eurocrypt) and can now only be found on digital on Hot Bird 5. Best van Nederland TV (BVN) will close it's analogue service on Hot Bird 1 11.283 GHz v. From 1 July 1999 BVN will only be carried in MPEG2 clear via ASTRA 1 G.



MCM now digital FTA on 12.245 h SR 27500 FEC 3/4

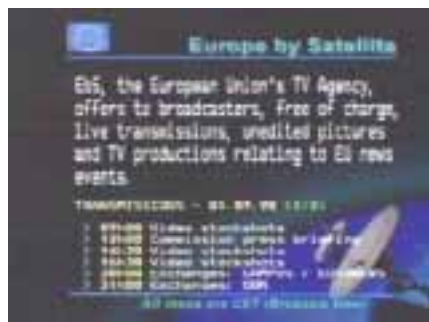
The pan-European news-channel Euronews started on Hot Bird5 12.597 GHz v (SR 27500, FEC 3/4). The audio line-up is as follows:

A-PID language
301 natural sound
302 English
303 French
304 German
305 Italian
306 Spanish
307 Greek
308 Portuguese
309 Dutch
310 Danish
311 Finnish
312 Swedish

The same audio line-up is valid for Europe by Satellite on EUTELSAT II-F3, 36 degrees East, and 11.139 GHz h.

The Polish Cyfra+ broadcaster has launched a new digital package on Hot Bird 4, 10.892 GHz h (SR27500, FEC 3/4), MPEG2/clear. The line-up includes; Polsat, Polsat2, Nasza TV and TMT

Satisfaction Club TV (SCT) can be found on Hot Bird 3, 12.303 GHz v, 23.00 till 4.00 CET.



Europe by Satellite - FTA on Hot Bird

VOX closed its analogue service on 11.604 GHz h on 1 March. The service will continue as a member of the German digital platform on Hot Bird 5-transponder 11.055 GHz h. Prime Time Sports and Babylon Blue have launched on Hot Bird 4, 10.722 GHz h (V-PID 1001, A-PID 1201), MPEG2/clear. EUTELSAT in Germany was planning to provide a special-interest programme called "Hot Bird Club" from the middle of February to the middle of April 1999. "Hot Bird Club" can be found on Wednesdays at 12.00 CET on 12.730 GHz h (SR 19998, FEC 2/3). Italy's parliament channel, Camera Deputacion, has started on Hot Bird 2 at 11.804 GHz v (SR 27500, FEC 2/3).

Eutelsat II f2 at 10 E

Turkish broadcaster Interstar has moved from 11.614 GHz v to 11.178 GHz v in clear PAL. Kral TV has moved from 11.631 GHz v to 11.131 GHz v (SR 5632, FEC 3/4). Europe by Satellite on 11.080 GHz h will close its analogue transmission later this year in favour of the digital feeds mentioned above.



Eros TV – Now digital only on Hot Bird

Sirius 2, at 5 E

Teracom/NSAB has started a promo-trailer on 11.727 GHz h (PAL clear). Check out new parameters for Merlin Network Communications at 12.111 GHz h: SR 27198, FEC 3/4. SVT Europe seems to have started at 12.640 GHz h (SR 4612, FEC 7/8, V-PID 160, A-PID 80), MPEG2/clear. Radio Sweden is available on this channel too (A-PID 176). Occasional transmissions from Denmark can be found on 12.615 GHz v (SR 7028, FEC

Intelsat 707 at 1 W

TV1 Finland and Russian broadcaster ORT1 have moved from 11.462 to 11.665 GHz v (SR 7380, FEC 3/4). PID details are as follows:

TV1 Finland V-PID 512 A-PID 640

ORT1 V-PID 513 A-PID 644

Amos 1 at 4W

Babylon Blue and ART TV Poland have closed their analogue services on 11.345 GHz h. The erotic-channel Babylon Blue has now started a digital service on 11.328 GHz h (V-PID 4194, A-PID 4195). Babylon Blue is carried between 23.00 - 02.00 CET with ART TV Poland taking the hours between 02.00 - 23.00 CET. Both channels are available in MPEG2 free-to-air. A new Romanian digital package can be found on 11.338 GHz h (SR 8640, FEC 3/4), MPEG2 clear.

The line-up is as follows:

Atomic TV Romania

Tele 7 ABC (test-card)

Radio XXI Test

Radio Activ FM

Telecom 2B at 5W:

RFO 1 & RFO Tempo have started on 3,746 R, MPEG-2/clear, SR 6654, FEC 3/4.

Gorizont 26 at 11 W

TV6 Moscow seems to have started on 3.815 GHz rhc in PAL clear, sound 6.60 MHz.

PANAMSAT 1 at 45.0 W

The 5 BT feed-channels seems to have moved from transponder 11.515 GHz h to 11.598 GHz h (SR 27337, FEC 5/6).

PAS 5 at 58W:

Enlace (Costa Rica) has started on 4,064 V, MPEG-2/clear, SR 3000, FEC 3/4.

From the Post Bag

Rens Maas e-mailed from Holland to say please check for a FTA MPEG2 feed of Dutch repeater PI6ALK on Eutelsat 16 degrees East. on 12.701 GHz h. SR 3.012, FEC 5/6. The Dutch repeater uplinks its signal to Eutelsat W2 at 16 deg E as well as being carried on a live internet feed on <http://www.tss-telecom.nl/pi6alk>. For those interested also in receiving this transmission check also the DVB 98 software site <http://www.dvb-soft.com/dvb98/>. Unfortunately I am not able to confirm reception of the signal through temporary problems in moving the antenna connected to my Nokia 9600 around to 16.0E. I would be interested to hear the experiences of others.



PI6ALK Mast

Ivan Currell, G3WBA e-mailed to say that following my comments on Astra reception last time he has only been able to find CNN on his Digibox's Electronic Programme Guide (EPG). He has been looking for other FTA channels on other digital satellites but after putting in the info from various Sat TV magazines he gets no reception and queries if the Sky 45cm dish is too small. As I said in my reply the situation is that even where a FTA service appears on Astra 2A it is up to Sky to allocate it a channel number in their EPG. There are currently two FTA channels broadcasting from Astra

2A, which for some reason Sky have not yet added to the EPG. These are; Travel Channel on 12.032H SR 27500, FEC 2/3 (afternoon till late) and CNE on 11.758H SR 27500, FEC 2/3 (evenings only). To receive these on a Digibox you need to go to the "Set Up" menu and choose "Add Channel". Just input the frequency in the right place and tab down as indicated. The on screen instructions lead you to storing the channels after it has searched. To view you need to go to "Other Channels" from the Sky Guide Main menu and they will appear there. Note you cannot tab down between CNE and Travel as in other Sky Guide segments but have to go back through the main menu. This is obviously a software weakness that may or may not get fixed as obviously these are not Sky Channels. As to receiving other FTA channels on a Digibox I have not tried it on the dish supplied. I am sure that if you used a 60cm with Universal LNB you would have no problem on Astra or Hot Bird services. The only big limitation is the Symbol rate and FEC parameters on the Digibox but you should see quite a few European services even with these limitations.

The Satellites are getting bigger!

By 2002, there will be geostationary satellites with 25 kilowatts of total power and 150 transponders, which in effect are replacing two of today's satellites. The "Double Decker" satellite as it is dubbed will be manufactured by US manufacturer Space/Systems Loral and will be officially called the 20.20. The 20.20 will be able to handle multi-region and digital processing payloads for a large range of applications. The key to this new generation of satellite technology

is; new, larger, and more efficient power-generating solar arrays with collectors and improved mechanisms; better power control and delivery units; improved batteries; a more efficient ion propulsion thrusters for station keeping; and advanced command and control systems. No news is yet available of likely deployment over European Skies.

Software Control for Digital Receivers

Those with Internet access will by now almost certainly have come across an organisation called SatcoDX which tracks on a daily basis the ever changing status of transponder allocations for European and other regional satellite systems. A logical step from having "read only" access to this data was the ability to update a receiver's database with information which is regularly updated. A Beta version of SatcoDX's own automatic receiver program is now available and can be downloaded from <http://satcodx.org/satcodx0.exe> or <http://satcodx2.org/satcodx0.exe>. Key features of this Beta version include;

- Download of complete SatcoDX chart (all 9 Control Centers)
- Choose which Control Centers should be saved to receiver
- Sort by TV and Radio
- Sort by three favourite channel languages
- Preferences are saved internally, and are resumed next time the program is started

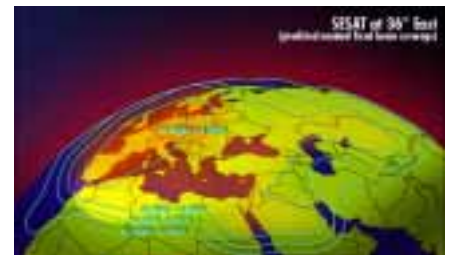
The Beta version works with DVB 98 Overflow software only and has been

tested successfully with Win 98 and NT4. Any queries should be addressed to: chartmaster@satcodx.com

Eutelsat goes West

With the positioning recently of a TVSat 2 at 12.5 degrees West, Eutelsat is now able for the first time to provide transatlantic connectivity. The first customer, Teleglobe, will provide Internet point-to-multipoint transmission capabilities. Eutelsat's European customer base will be able to access North America via Teleglobe's Teleport facilities. It is believed that Eutelsat II-f1 and Eutelsat I-F5 will also be positioned at 12.5 deg W by the time you read this. With only five transponders it is not likely that TV Sat2 will be employed extensively for heavy transatlantic traffic and is nearing the end of its operational life. I will provide more details in due course as they become available from Eutelsat.

The footprint for SESAT due for launch in July and to be located at 36.0 East is shown above. SESAT will launch aboard a Proton rocket and will have 18 transponders in Ku Band



Conclusion

That's it again for this edition of Satellite TV News. As usual the e-mail address is paul.holland@btinternet.com or QTHR for any news and views you may have on the Satellite TV scene.

Free Internet Dial-Up Accounts for BATC members

Caladan Communications, a UK based Internet Services Provider are pleased to be able to offer BATC members free dial-up access to internet e-mail and news services. Contact Chris Smith (G1FEF) for more details:

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Or write to: 'Free BATC offer' Caladan Communications 25 Dando Close, Wollaston, Northants, NN29 7QB

The VPR 2 VTR

By Trevor Brown

This 1" C format VT machine, that was very popular with the broadcasters only some 7 or 8 years ago, seems to be finding its way onto the surplus market at very reasonable prices. It was designed and marketed by Ampex and made under licence by Marconi; both versions started out the same. Marconi then followed a path of separate development. The machines come in two parts the VT machine or transport and the time-base corrector. They are available in a studio console configuration that holds both units and provides very comprehensive monitoring, comprising a picture monitor (usually black and white), waveform monitor and Vectorscope, or as separate transport and TBC units. This separate configuration frequently uses the Marconi monitoring unit which superimposes the waveforms on a picture monitor, which is how they were often used on outside broadcasts. They have full slow motion, two main audio tracks, and a third audio track which is usually configured for timecode. They have a very useful built in edit controller, which I will run through in more detail. The only limitation is a non-component format and a maximum spool size of 90 minutes; this latter is probably why they found their way to the surplus market. There are kits that adapt the non-console version for 2hr spools, but it's not something I would not recommend.

The main problems to look out for when considering these old machines are the mechanics. First the scanners can be a problem; if the scanner light is illuminated when the scanner is run up or the 5 amp fuses on the MDA (Motor Drive Amplifier, located in the back of the machine) have taken to blowing, then the scanner is in need of mechanical attention. This maintenance requires specialised jigs to assemble and balance the scanner and this puts this work beyond kitchen table maintenance. The heads have a limited life, and although they were around £1000 each when these machines were broadcast equipment, they can be found around at reasonable second hand prices. The heads can easily be changed and tested, providing you have a



VPR-2B Video Production Recorder

working machine.

The Replay or AST head (Auto Scan Tracking) can be checked in replay for RF on the waveform monitor and pictures. If you change this head then you must set the AST up as per the manual or you will not have slow-motion capability. This operation requires moving jumpers on the AST card to produce a ramp that is modulated and this modulation requires nulling when viewed on a scope (not the waveform monitor).

The record head becomes the replay head if you turn the editor to insert, and turn the Auto Edit switch on (front panel). The scanner will re-phase, so the picture after the TBC may become mis-framed, as the machine locks to input video. Replay of a picture and the presence of RF on the waveform monitor will indicate that this head is

functioning.

The flying erase head, also located in the scanner, is only required for editing functions, although strictly speaking its mechanical presence, along with the dummy heads, is necessary to maintain the ability to make interchangeable recordings. Tip damage will limit programme interchange. Operation with a head absent will severely unbalance the drum and may lead to damage. The flying erase head can be tested by recording in insert mode over a previous recording and turning the current through the record head to zero (Video Record level board 6). The post erase will not be running in this mode and so the only erase being carried out is by the flying erase head. If the old recording is visible, then the flying erase is not functioning and it is likely that this could be a faulty head.

Assuming you have two working machines, and that one of them performs reasonable edits, then you have the makings of a simple to operate edit suite utilising the built in edit controller. Find the machine that makes the best edits to use as the record machine. This is best checked by inserting colour bars into colour bars, if the picture moves sideways at the edit point then adjust the burst/sync \emptyset on the tape H comp board in the TBC, to illuminate the edit ready light, on the run up to the edit.

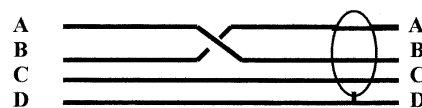
The built in editor can perform edits on sound or picture or both, and edits can be rehearsed and adjusted before being printed. Split edits are possible but are not fully programmable, the later of the split must be manually operated at the correct point, by use of the inhibit switches found adjacent to the editor knob.

Along with colour black reference to both machines, and sound and video connections between the machines, you will need the auto play sockets connecting together with an auto play lead. If your machines did not come with this four-wire lead, then the diagram below shows you how to connect the sockets together, note the cross over configuration. I have not found a source for the plugs, but if you have a spare one, I could give it a good home.

Once the machines are connected turn the Auto Editor on, (record machine).

Set the pre-rolls on both machines to seven seconds (module 18 switch up). Select insert or assemble on the record machine, (depending on whether you have a

tracked tape or not). Set the Multi VTR (control module) to send on the record machine and receive on the play in machine. Select the in point on the record machine and an out point, if you require one (this will only function in insert mode). Mark the desired point on the play machine and then press the search button on the record machine, when both machines will roll back 7 seconds. "Play" on the record machine will roll both machines and after 7 seconds you will see and hear the edit being rehearsed on the record machine monitor. The edit can be remarked and rehearsed until you are happy and then printed in the same way, only this time press the record and replay buttons simultaneously on the record machine.



Once you have printed an edit you will have to turn the editor off to review the edit (or it will be rehearsed again); remember to turn it on again before you resume editing, or you will go into master record and spoil your handy-work.

You are only working with the control track and not timecode, but having said that, your printed edits will match the rehearse. Timecode modules do exist and can be fitted in module position 16. These modules are rare and rumoured to overload the machine power supply. To move up from these simple cut edits to a full edit controller is a difficult step. Edit controllers do exist, for the VPR2, but the design of these machines pre-dates the 9 pin P2 universal edit standard and is probably another reason they turn up on the surplus market at affordable prices.

I hope these notes help. They were not intended for the machine owners who have probably surpassed this level, but are useful if you have the space and are contemplating buying one or more machines. One last word of warning; when the VPR2 was designed a fourth audio was part of the C format specification. This never reached reality and, although a spare slot was left for the module in the VPR2, it never became available. This slot is now occupied by a Dolby noise reduction card for audio 1 and 2. This new card requires a modification to the motherboard. Part of this modification is the addition of a small flexible PCB,

fitted to the back of the mother card, behind the Audio 4 module slot. The early flexible PCBs gave trouble and are difficult to replace, assuming you can find an equivalent. If Dolby by-pass does not work, or removing the Dolby module does not bring the Dolby bypass into operation, then this PCB could be the problem and you may wish to pass on that particular VPR2.



TBC-2B Digital Time-Base Corrector

The Nature of Video (part 2)

By Henry Ruh, KB9FO

If video is an AC signal, where does the DC come from?

It seems the most perplexing aspect of video modulation and transmission is that video has both AC and DC components. The AC portion is easy to see, the DC portion is a little less obvious. When I wrote the NATURE OF VIDEO a few issues back, I had to decide if each topic should be brief and concise, as this is the important stuff or if I should include a lot of the supporting theory behind each. I opted for the simple explanations so it would fit! So here is a little more detail on a couple of topics from the first segment. Video modulation is unlike any other mode in a couple of distinctive ways. Besides being composed of higher frequencies (up to 5 MHz, even more if you use some computer graphics or a character generator) the modulation is applied in a different manner and the modulation itself is a strange animal if we compare it to analogue voice AM modulation.

Fourier analysis would project that any complex waveform can be defined as a combination of sine waves, of various harmonically related frequencies. Rather than get into a lengthy mathematical discussion, which readers tell me turns them off, here is a practical example. Start with a simple sine wave. Pick one, any one. Draw it out on paper so we can visualise it. Now on a second sheet, draw the second and third harmonic of the first sine wave, using the same scale:

Now cut the pieces apart so and lay each over the other so we can see all three at the same time (by holding them up to a light). Besides three sine waves, we should also be able to trace out the additive function of the shapes which now begins to look like a worm, or soft rectangle. If we ignore the bumps, and draw a line across the tops of all the bumps and the bottom of all the bumps, the rectangle takes on more shape. If we add more harmonics we would begin to fill in the dips and smooth out the valleys, and the start and stop points would become more vertical ie, a 20th harmonic would have a very steep beginning and ending waveform.

What we call a square wave, is really never square since a signal cannot instantly go from a zero state to some voltage state (say one volt). There is always a rise time. This rise time can be defined in either frequency or time domains. That is, it can be said the waveform has a rise time of 1 microsecond, or it has a rise time of 1 Megahertz. Either defines the slope of the waveform as going from zero to one volt in a particular way. In video, for the NTSC system, the maximum modulation frequency is defined as 4.5 MHz (5.5MHz). So the maximum SINE WAVE modulation would be a signal of 4.5 MHz (5.5MHz), or roughly 0.2 microseconds also known as 200 nanoseconds. This is also known as the aperture limit or Nyquist limit of modulation. A square wave of 4.5 MHz (5.5Mhz) could not be passed since to be a "square" wave, it must by definition, have frequency components above 4.5 MHz (5.5Mhz). In fact the highest practical "square wave" in video is about 1 MHz, depending on how round we are willing to have the corners. This is also the defined rise time for all pulses used in transmissible video. By the way, rise time is defined as the time it takes for the signal to go from 10% to 90% of the difference between the two voltage points. For example, going from zero to one volt, the time would be measured from where the signal passes from the 0.1 volt point to the 0.9 volt point. This eliminates the confusion of where does the "knee" start or end.

In video, there are also two frequencies generated for each video element. A video element is any transition in level. This could be from blanking to sync pulse, or from blanking to white, or from 50% white to 51% white. The amplitude of the transition, determines how much energy will be in the sideband it generates, which is separate from the frequency of the sideband it generates. If we modulate a normal carrier wave with a sine wave, on a spectrum analyser you would see three blips, the centre being the carrier wave frequency. On each side would be a blip which represents the original modulating frequency. If we had a 1 kHz modulating signal and a carrier wave of 1 MHz, we would see the blips at 999,000 Hz, 1,000,000 Hz and

1,001,000 Hz. This is fine for audio, because there is only a single frequency/time component to the modulation. In video, there is a second aspect.

All video is a repetitive waveform, because of the scanning of the image, the same transition will be "seen" each time the scanning gets to that particular location. For simplicity, lets use a picture with a single white line, vertical on the screen. The remainder of the video is black. Each time the scan system bumps into the white line, it will generate the sideband that represents the frequency of the slope of the transition from black to white and back again. Since the white line is vertical, it will be "seen" on every scan line, $262\frac{1}{2}$ ($312\frac{1}{2}$) times per field, (minus the vertical sync period) or about 241 (289) times, which, because we use interlace scanning, is 482 times per frame (two fields) x 30 (25) times per second, or 14,460 (14,450) times per second. We add back the vertical interval time, which is just a temporary lapse of video, and we have a time between "bumps" of about 65 (64) microseconds, or 15,734 (15,625) Hz. So a second sideband is generated at 15,734 (15,625) Hz, as well as the frequency of the slope (say 4.5 MHz (5.5Mhz)) of the transition. If the transition is large, the energy in the sideband will be large, and if the transition is small, the energy of the sideband will be small.

If we rotate the line so it runs diagonally, we will get the same results, since the scan rate determines the first sideband component, and the slope of the transition determines the second sideband component. All the sidebands will exist at multiples of the scan rates, 30 (25), 60 (50) and 15,745 (15,625)Hz! These sidebands exist instantaneously and simultaneously. So the amplifier has to produce a power bandwidth of 4.5 MHz (5.5Mhz) (9 MHz at the amplifier device, part of which will be thrown away in the sideband filter later). If there is a sound subcarrier, it will also exist at the same instant, and if the line is coloured, not just white, there will be colour sidebands generated as well. Even the most simple video element generates a considerable amount of information in

the modulation process.

In audio, the modulation is symmetrical. For the most part, if you divide the signal into positive and negative portions, they would cancel out to zero. If you look at audio on an oscilloscope, you will note that the little green worm tends to stay wherever the centring control put it, and the audio waveform is a series of wiggles above and below this "zero" voltage reference. There are both positive and negative parts of the waveform, and the centre of this is zero volt. Not so video. Video waveforms go from zero to one volt. Our little green worm will dance up and down in response to the average DC level (ac coupled scope). In baseband this is usually zero volt for sync and one volt for white. In the TV transmitter this is inverted so that one volt = sync level, 0.714 volts = blanking and .1 volt = white.

In order to maintain the black and white levels and sync levels to precise values, both the transmitter and receiver have circuits, called clamp or DC restorer, which force the signal to be at a particular level for various reasons. First, we want the transmitter to always be at maximum power only during sync pulses. Second, we want a constant black level, so the picture contrast ratio stays the same. And we want to limit the white levels so that we never have a zero carrier (over modulation) state. The values of these are precise voltages. At the one volt standard video signal, we divide the signal into 140 units. 40 are used for sync and 100 are used for video. Another 20 units of bias are used for the level between TV white and absolute minimum carrier.

For the 140 unit signal, there are 40/140 volts of sync and 100/140 volts of video, or 0.286 (0.3)volts of sync, and 0.714 (0.7)volts of video. The sync portion is constant. There should be no variation in the level set for sync and blanking. (Blanking is the "zero or black reference for video). In the transmitter, the power is held to 100% for the sync pulses, and 56% for the blanking level. The video can be at any level from 75% to 12.5% power. Because there are two functions, sync and video, and the sync is constant and the video is not constant, the average voltage level over any time period of less than one line will be any value

between 100% and 12.5%, and for any period in excess of one line the average voltage will be between 75% and 25%. By keeping the blanking level constant, the two portions of the signal, that above and that below 0.714 volts will almost never cancel out to zero. There will always be a generated average bias voltage, which represents the average picture power in any one line, frame or field. This is the DC component generated by the video signal. The DC level is at its highest during vertical sync, when the transmitter is generating 100% power for the greatest period of time, and it is lowest during an all white picture, where the transmitter is generating 100% power for 5 microseconds, 75% power for another 6-8 microseconds, and 12.5% power for about 45 microseconds. During vertical sync, the average power is about 92% and during video, about 23% average power. The only time the apparent DC level is zero is when the transmitter rests at a constant power level. There is a time constant involved, so the DC level is actually always changing except under static, test signal conditions. The negative only modulation voltage also means that there is a DC component to the video signal, since it always offset (biased) from zero volts, and there is never a corresponding "positive" modulation voltage.

Note that in the transmitter we DC bias the signal by about 0.12 volts so that the white level can never achieve zero carrier. Otherwise the one volt signal would clip the carrier when there were 100 IRE white levels (or more) causing splatter, sync buzz, loss of audio carrier recovery and other nasty things. This leaves a little modulation room between peak white and zero carrier level. Thus, a minimum of 10-12% carrier power is always present.

In the old days, TV receivers lacked the DC restorer circuit (typically just a diode) and it was not uncommon to see the retrace lines during bright scenes, when the picture tube would be biased by the DC component of the video to a point above blanking (extinguishment) and when the picture was very dark, it was REALLY dark.

Now to add to all this, is the vestigial sideband filtering. If receivers centred the carrier in the IF passband, and we transmitted both sets of sidebands equally, (upper and lower) we would

have no differential between the sideband power for low frequency and high frequency modulations. But video as any AM signal is redundant between the upper and lower sidebands. They start out identical, but when we look at the energy of the sidebands, we find that the low frequency modulation components are quite strong, and the high frequency components are very weak. This means nearly all the sideband power is very near the carrier frequency and very little is in the areas of the spectrum away from the carrier. In fact, nearly 95% of the video sideband power falls within the first 1 MHz. If we were to remove one entire set of sidebands, we would also remove a considerable amount of the DC signal, and the low frequency response would be quite poor, resulting in smearing and blurring of the video. If we only remove a part of one sideband, we keep a faithful representation of the video and the DC voltage generated. The small error, typically less than 3% is not discernable. But it also means we have cut the power of the higher sidebands in half, since we threw half away in the vestigial sideband filtering process. So the receiver IF is tuned such that the high frequencies are fully within the passband, and the carrier and low frequencies are on a slope of the IF filter, so that the carrier is at the 50% level. (- 3 dB power) This equalises the sideband power. When we tune our ATV receivers, this causes a curious effect.

If we tune the receiver for maximum picture, we have shifted the incoming carrier to the centre of the IF passband, so that we fully recover the low frequency sidebands which would otherwise be 3 dB down. To accomplish this, we have shifted the video carrier within the IF passband by about 1.5 to 2.5 MHz (remember we are looking at a 6 MHz wide channel and IF). (NB. There is no sound channel on ATV in the UK of on 70cm) Where is the sound? It's gone! Which is why on weak signals we can tune our ATV receiver and get PICTURE OR SOUND BUT NOT BOTH! The 4.5 MHz (5.5Mhz) subcarrier is now above the passband of the IF and has been cut off by the IF filter! This is one reason the sound "disappears" long before the video. Its like using the IF shift on an HF SSB receiver, to shift an interfering signal out of the passband and eliminate it.

Commercial TV stations use audio carrier levels of -7dBc to -15 dBc (a 5% to 20% of video carrier power) So the aural carrier is much stronger than a typical ATV transmitter which uses a subcarrier level of not more than -15 dBc (dBc means dB relative to the video carrier). ie, a commercial station could be using five million watts of video PEP and one million watts of audio while we use 100 watts of video and three watts of audio which after VSB filtering is 1.5 watts of audio! So now you know where the audio went! For better audio, use a separate transmitter or a second band ie two metres 144.34 for audio (in the UK we use 144.750) with video on 70 cm, 439.250 MHz. Likewise, our 100 watt video signal with its "handy-talkie" audio signal is not likely to bother anyone!

But, you say, when I look at a waveform on the oscilloscope, the colour is more than one volt. Not so my friends. The oscilloscope is a simple voltage measuring device. It cannot separate (without filtering) the various components of the TV signal by frequency. A waveform monitor is a specialised type of oscilloscope, which is equipped with filters to allow us to look at the luminance, chroma or both parts of the signal. In "flat" response, the same as an unfiltered oscilloscope, the display simply adds the chroma signals to the luminance signals. In truth, the chroma signals are completely independent of the luminance as they are a subcarrier modulation. To be more accurate there are two subcarriers and they are each modulated as double sideband, suppressed carrier. A balanced modulator takes the signal and makes it DSBSC so only the sidebands remain. The two components of the colour signal, I and Q (for In phase and Quadrature phase, meaning 90 degrees difference) (also called R-Y and B-Y) each have two components. The amplitude of the colour signals represents the saturation, and the phase of the colour signals represents the colour hue. In genuine NTSC there is also a difference in bandwidth, one being 1.5 MHz the other being 0.5 MHz, which in cheap equipment is reduced to 0.5 MHz. for both, tossing out the higher frequency colour components (picture detail). The colour subcarrier, 3.579545 MHz (called 3.58 for short) was chosen so that the colour sidebands fit in between the luminance

sidebands. With this, two things happen, first, we can separate the Y (luminance) and C (chroma) signals using a frequency comb filter, and second, since the sidebands are never on the same frequency, there is no direct additive effect. They both exist at the same time, but never at the same frequency. For those on the PAL system, the colour carrier is about 4.43 MHz and there are two "burst" signals, called U and V, for Unvarying and Varying. There is also a transmission system with a mixture of 625/50 scan rates and 3.58 colour but it is seldom used.

So on your voltage scope, you may observe a highly saturated colour signal as appearing to be 1.5 volts peak to peak (P-P) but in fact only one volt (or less) is luminance, and the remainder is colour. Now since the colour signals are suppressed carrier signals (sort of like SSB audio) we need to insert a small amount of carrier at the receiver to recover the signals - a BFO (beat frequency oscillator) of sorts. We also need to be able to lock up the receiver oscillator so that we recover the correct phase and amplitude so the colour is stable. This is where the burst signal comes in. At the back porch of sync (the area after the horizontal sync pulse and the beginning of the picture) we insert nine cycles of the original 3.58 carrier. This is enough so that when it is recovered at the TV set, the local 3.58 oscillator is phase locked to the original carrier and we can demodulate the signals with the receiver generated continuous 3.58 carrier signal. PAL system readers, just replace 3.58 by 4.43.

The amplitude of the burst signal is also used. The colour detector circuits adjust their gain (colour intensity) inversely to the colour burst amplitude. The normal level of the burst signal is 40 IEE units (0.286 volts) the same amplitude as the sync pulse! By comparing both, we can decide if the burst is lower or higher than the normal level. If the burst signal is low, the circuits add more gain (turn up the colour) to compensate. If the burst is higher, the circuits reduce the gain (turn down the colour) to compensate. This keeps the colour intensity from changing even though the signal strength of the TV signal is changing. Without this action, a fixed reference, the colour would change intensity with the strength of the received signal.

Viewers near the transmitter would have overly saturated colour, and distant viewers would have little if any colour. OK, but why does my watt meter go down when I turn up the video gain control of my transmitter, aren't I losing power? And why doesn't it ever go up like my AM transmitter does when I speak in the mic?

No. the power is not changed, only the detected average power has changed. Remember back to the start, I mentioned that normal AM voice modulation is symmetrical. There are positive and negative voltages generated with a zero volt starting point. So when you add the voice signal to a carrier wave, you have both positive and negative voltages being added to a steady CW waveform. The result is part of the time the signal is audio + carrier and part of the time the signal is audio - carrier. The sidebands are additive on the wattmeter, so you see 100 watts of carrier with up to plus fifty watts of audio. When you talk, the watt meter, a voltage sensing device as the oscilloscope, moves up to show the increase in additive signals.

In video, the signal has only positive voltages (sync is zero volt) in baseband signals, which is inverted in the transmitter to negative only voltages. The zero volt sync signal is still zero volts, so the carrier plus sync still = 100 watts, we have 100 watts of carrier and zero watts of modulation. When the video signal goes to blanking (black) level, we have - 0.286 volts added to the carrier, so we have 100 watts minus the power of the negative sidebands, so we have less than 100 watts, or about seventy-five watts average power. When we add the white portion of the video, we have the - 0.9 volts added to the carrier power, or 100 watts minus the white power sidebands, or about ten - fifteen watts. So your watt meter senses the positive carrier voltage and the negative video voltage and says you have (on average) about twenty - thirty watts. There are never any positive going voltages so the meter can never go up (carrier plus positive modulation). Your peak power is unchanged, it is still 100 watts, but the watt meter is an average responding device, so it is showing the average power or APL (average picture level).

Keep in mind that we want to limit the white video levels so that we never have less than 10% power, which

leaves room for the audio subcarrier wave at 4.5 MHz (6Mhz). At the receiver the video carrier is used to "beat" against the FM carrier at 4.5 MHz (6Mhz). The difference frequency is the recovered audio. Unlike the colour signals, the sound signal has a carrier, and so it "rides" on top of the video carrier in a voltage/ power sense. If you use separate transmitters, thus separate carrier waves we can run our video transmitter at full output and sync will equal 100% power. If we mix the sound with the video (called multiplexing) then we need to have some reserve power for the audio carrier, so sync should be 90% power of our amplifier, and the sound takes up the remaining 10%. In commercial TV we might get 60 kW from a single tube in "vision only" service, but have to operate at 40 kW for combined,

audio/video, service. Most hams use the multiplexed method since it means much simpler designs. A few hams will operate separate transmitter for sound and video, and either combine them at the transmitter output, or (rarely) use two antennas and let the signals "mix in the ether."

Using the multiplex system also has some drawbacks. Intermodulation products can creep into the signal since it is not likely we are using a class A RF amplifier. We use a "brick" class C or poor class AB amplifier with two coax connectors, black heat sink fins and two power leads, red/black, exiting the box. When the carriers mix, (colour, sound and video) we can get a triple beat. No, not a new rock rhythm, but an interference in the picture from a 928 kHz signal that is generated by the

intermod of the amplifier. To minimise this, we use less than full audio power level, and use an audio carrier that is 15 dB below the video carrier, (noted as -15 dBc) or even a little less. So when choosing a transmitter, make sure it has an adjustable FM sound injection level control, so we can find the happy point between intermodulation and not enough audio carrier to be heard.

OK, enough heady stuff. 73 Henry KB9FO

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Please note: This article was written for the 525 NTSC system as used in the USA. The bracketed figures in italics apply for the UK 625 line, 50 field PAL system. – ED.

The Changing World of ATV

By Eric Edwards, GW8LJJ

Electronics has changed a great deal over the years. I started in the 1950s and have seen many changes, although looking back they all appeared fairly recently on what might be called a logarithmic scale. It was probably around the 1980s that I found the start of the most dramatic events. From the 50s through to the 70s there was still evidence of valves being used, with transistors in conjunction with integrated circuits. It was fun constructing television gear as it was difficult and indeed expensive to buy, if that is what you wanted, commercial equipment.

I know progress is good and it makes available equipment that would otherwise be too expensive to purchase, but it takes away something from the hobby. I can't quite put my finger on it, but it could be something like one-upmanship, or "look how clever I am" and deservingly so, as there are quite a number of clever guys out there. The same, I guess, happened with amateur radio when CB was introduced into this country. When something is easy to obtain, the challenge diminishes along with the enthusiasm. Back in the 70s I took an interest in SSTV to work alongside FSTV, but my interest has

now gone because of the readily available software computer programs that are available, which unfortunately destroyed my interest. This was not because of the efforts of the clever software designers out there but more of "if it doesn't work on my computer I don't want to know" type attitude from the so-called TV amateurs receiving my home-brewed television pictures, where all they had to offer in return was pictures generated by someone a lot cleverer than them, on a CD ROM. The problem is, it makes people lazy! That in itself creates lack of interest amongst those people instead of encouraging them further into this interesting field of amateur radio. It is now so easy and affordable to generate so-called SSTV pictures with the aid of computer video "grabber" cards and the like. I can accept that, as long as the media is used to improve the quality of amateur television.

To try to explain this is difficult but I shall try. As a television amateur, the interest is transmitting television pictures. As a pioneer of amateur television this was done through a series of experiments. The icons were anything that was broadcastable. It could have been anything, as long as it had detail and depth. The enthusiasm

was on a par with a first-time amateur photographer. As you become more proficient, your interest in sending pictures became more 'television oriented', such as test cards and shots of the shack. Compare that with today's amateur, when one said to me "I don't have any pictures of the shack to send you, and I don't have a camera anyway to send you live pictures". When that person asked if I would like to see some pictures from a CD ROM he had just purchased, I told him to file the CD ROM to a 60 degree angle so that it was easy to shove it right up ... as I was saying, there is a decline of true amateurs, not because of lack of interest, but more of "well, someone else will probably do it anyway".

As I stated, my time is limited because of work and personal pressures but, nevertheless, I hope to design a 'computer free' SSTV system that is at least as good as the software version. Watch this space! Or something like that. In fact, I shall make you a definite promise that I shall come up with a circuit for a free standing SSTV transmitting converter as good as the computer generated stuff that is available at this moment. I dare someone to beat me to it

MCR11, the Road to Rebuilding

By Steve Woodgate

Seven years ago, I acquired my first TV camera, a Link 110. This was quickly followed by a second to form a 'breeding pair'- a philosophy that seems to have stuck, and I have tried to find couples for the collection ever since. All was well for a while, along came the LDK 14s, LDK 15s, LDK 5s, LINK 125s, Marconi Mk 8/9s etc, all in pairs wherever possible.

Then, a problem. Because of the size and nature of these one-eyed monsters that I had so avidly collected, I had run out of space, and it was becoming difficult to 'get them out to play with'.

All these cameras had a pile of electronics that needed power and synchronizing pulses to drive them, and really ought to be set up in equipment racks, with all the bits and pieces to hand so all I had to do was (in theory) plug in the camera heads and switch on (watch for smoke signals from the Link base electronics!). As mentioned, I had run out of space, so, short of moving or building an extension on the house, another solution had to be found to house the vision mixer, tape recorders, monitors, sync pulse generators etc.

Through the grapevine, I heard of an old OB unit that was for sale. This was an ex BBC truck from the 1960s with a large thirsty petrol engine. I made a few phone calls and arranged to go and see it. Unfortunately, circumstances dictated that I was not to have this vehicle, and so the search continued. Some time later, I received a call from the seller of the BBC truck that I had intended to buy. Good news !!!!, there were some more vehicles coming up for disposal in the south !! Several phone calls later, and I'm on the way with a mate to see a truck in Southampton.

We arrived at the site, and there it was, a cream and brown monster sitting in a corner of a car park. I remember saying "I'll have it" before we went through the gate!!

The truck was based on a Ford D chassis, with a 'Luton' body, all 9 1/2 tons of it.

The doors were

opened to reveal a sorry looking interior; the truck was basically complete, with wires hanging out all over the place. All that appeared to have been done was that the equipment had simply been unplugged and removed.

In one corner was a pile of black and white monitors, all the worse for wear. The vision mixer was still fitted, complete save for one module. Further looking revealed a folder containing a vital ingredient, the truck wiring diagrams!

Armed with big batteries and jump leads, we set about getting the truck started. A basic knowledge of diesel engines was put into practice. Unfortunately, the cold start device would not work, making starting difficult. (Try starting a car on a cold day with no choke!). So on with the battery, and wind the engine over. After what seemed an age, the engine fired and burst into life, the first running in 4-5 years I believe. We left the truck ticking over for awhile to allow the engine to warm up slowly. (Very important for an engine that has not been run for a long time, it allows the oil to get round the system - damage can result from revving a cold engine as soon as it has started).

With the engine warmed up, it was time to tackle the next problem - a stuck clutch. In the end, the truck was started in gear, and driven round the car park with the clutch pedal pressed down in the hope that the heat from the engine would do the trick. After a few minutes, a bang from the engine bay and the clutch was free, a quick check of the gear box and all was well.



We left the truck and headed home to sort out payment, and most importantly an HGV driver to get it home. A few weeks later, we're back with batteries, an HGV driver and a set of L-plates. I had planned to drive the truck at least part of the way home.

Several hours later we arrived back, and parked the truck in its new home.

For the next few weeks, I was ferrying equipment to the truck, some 10 miles away from home, and bolting it into place. Then, armed with a newly acquired HGV licence, I took the truck home to power it up for the first time - no smoke or flames - a good sign.

Things moved on quickly from then, and I soon had an operational vehicle. We took it to the BATC Rally at Coventry, and set up several cameras on the site. The event was a success, apart from two blown tyres - one on the way up, the other just outside Brighton on the way home.

I have taken the truck to three rallies now. Each time the truck has been updated, with extra goodies bolted on. The amount of work to be done before each trip is getting less as the newer equipment is proving to be more reliable.

In its present state, the truck is fitted with six Hitachi cameras, a Grass Valley vision mixer, Ampex 1 inch VTRs, Alice sound desk, and a Drake talkback system. The truck also sports a new hand painted (no mean feat) colour

scheme, a close resemblance to its Southern Television days (using a water based gloss from the local DIY store, a quarter of the price of coach paint and just as good - easily applied with a roller!).

Recently, the truck was used by the East Sussex Amateur Television Group as the control room for an emergency exercise with the local council where the pier was blown up. We had 2 10 GHz links from the land and seaward ends of the pier, with cabled cameras in the 'reception centre' (the local swimming pool complex). The live pictures were sent up on 23 cms to the local repeater GB3VX and were viewed by the exercise commanders

and council officials in the town hall. We have also covered a number of local events and rallies with pictures again viewed via GB3VX, the most interesting being a country show with a dog fight display overhead between a Spitfire and a Messerschmit, not an easy job for the cameramen and ladies. (A truck like this has to come with an understanding wife! Thanks Sue).

In addition, this is not a one man operation, and I am grateful for a crew of willing helpers who come out and fill the roles required, from Director/Vision mixer through to camera operators and caterers (I tend to fill the roll of vision engineer and Mr fix-it!).

To set up for an event requires several days of preparation, audio and video cables have to be run, in some cases dug in trenches, a power supply needs to be arranged - we have a 30 KVA 3 phase diesel generator, lighting needs to be sorted, food ordered and so on. For all the hard work though, it provides an interesting challenge and a different way to spend a weekend!

I would be interested to hear from anyone with any pictures of mcr 11 in use with either Southern Television or TVS. I can be contacted on: - 01323 849211.

See more pictures on the inside covers and in the 'Photo Gallery' on page 42.

A Shack Stereo Audio Mixer the Easy Way

By Bob Platts, G8OZP

I had been for some time intending to build an audio mixer for the shack but as usual I could never seem to find the time. However whilst looking through the Maplin catalogue I came across a four channel stereo mixer for only £29.99 (Maplin stock XJ14Q). The unit is internally battery powered (PP3) with an external DC input socket and is encased in a strong metal enclosure.

The unit is obviously designed for a simple disco system as two of the inputs are high gain with RIAA equalisation for connection to a phono cartridge plus an input for a dynamic microphone and an auxiliary input.

The output does not have a master level control and nor does the monitor headphone output. However I did not consider this much of a draw back.

As most of my equipment uses signals of about line level (0.5 - 0.75V RMS.) the high gain phono input stages would require modification. Fortunately the unit is supplied with a circuit diagram. Inspection of this and the PCB revealed that modifications would be very simple. If the input stages were converted to unity gain, with a line level input and the controls set to mid range line output level would be produced.

To convert remove the PCB (the knobs pull off) and locate IC2. The notch identifies pin 1. Locate pins 2 and 3



and short them together. Locate pins 7 and 8 and short these together. Locate IC3 and do the same. The two phono inputs now have unity gain and accept line-input levels.

Alternatively remove C16, 17, 18, 19 and R33, 34, 35, 36. Then instead of shorting together the pins on IC's 2 & 3, link with a sub miniature preset. The gain depends on the value. 10k provides x10 gain, 20k provides x20 gain etc.

The Auxiliary input already accepts line input and therefore did not require modification. I decided to leave the microphone input as it was.

The DC input connector is of the 3.5mm push in co-axial type often

found on modern equipment. Unfortunately it is wired with the positive to the outer sleeve which is a recipe for disaster. It may be worth considering reversing the polarity and changing the markings. A power on indicator is not fitted so an LED may be considered worthwhile.

If stereo is not required the two channels could be used separately. I have used the unit for both TX and RX mixing. Audio for the TX (Mic, Ident tone & VCR) passes through the right channel. RX audio uses the left channel (RX audio, microphone for adding notes and commentary, and talkback channel). Once one gets use to setting the controls on switch over, it works very well.

The New 10GHz UK ATV Bandplan from Feb 1st 1999

By Graham Shirville, G3VZV

Back in August 1998, the RA announced some changes to the UK 10GHz Amateur Radio Service allocation. This has meant that six of the seven 10GHz ATV repeaters have had to go through the process of changing their output frequencies to fit in the new allocation.

All the groups have very rapidly completed the required paperwork so that the new frequencies can be cleared by the RA.

The new available frequencies, which have been agreed with the RSGB Microwave Committee are shown below and come into effect from Feb 1st 1999:

- 10015 MHz transponder output
- 10040 MHz transponder output
- 10065 MHz transponder output
- 10240 MHz transponder output
- 10265MHz simplex use
- 10290 MHz transponder input
- 10315 MHz transponder input
- 10340 MHz transponder input
- 10425 MHz transponder input

The existing repeater units as detailed have selected the new frequency pairs:-

- GB3BG Sedgeley W.M.
10240MHz out 10425MHz in
- GB3DJ Telford10065MHz out
10425MHz in
- GB3RV Brighton10240MHz out
10425MHz in
- GB3TG Milton Keynes10240MHz
out10425MHz in
- GB3XG Bristol10065MHz out
10315MHz in
- GB3XT Burton-on-Trent
10065MHz out 10340MHz in

NO CHANGE FROM EXISTING

- GB3XYHull10065MHz out
10315MHz in

Hopefully all the units will have successfully QSY'd by the time you are reading these notes.

Channel designations

With the present need to keep the 23cms ATV repeaters well away from the nearby radar's and with the regular changes to 3cms frequencies it has been suggested that we adopt a "flexible" channel numbering system based on the last three digits of the actual frequencies being used.

For instance, GB3TV which uses 1249.0 MHz input and 1318.5 MHz output would be defined as 490/185 and GB3DJ on 3cms which uses10425MHz input and 10065MHz output would be referenced 425/065. There is obviously still some possibility of confusion about the actual band being used but the scheme would at least allow the actual frequencies being used to be clearly defined and easily recognised.

Bad News for Repeater Groups

Over thirty repeaters in the UK, including at least two ATV units, site share on masts that are also used for public broadcasting. These sites are now owned by NTL (used to be the IBA) and CTI (used to be the BBC) and, up to now, amateur repeater groups have paid only "peppercorn" rents for the use of the site in general and for the space on the mast.

These special rates have been administered for some time by the RSGB but major changes have been expected for some months. It was therefore not a surprise when, late last year, both landlords informed them that we would have to pay 50% of the commercial rates and over £100 per year for electricity. As the commercial rates can be over £20,000 per year in some instances, this will obviously be a big problem for many groups.

Further negotiations have now taken

place and the implementation will now be staged over between three to seven years depending on the circumstances. This major concession, whilst welcome, will not prevent groups having to look fairly quickly for new (almost certainly inferior) sites. Please be understanding if your local repeater group is one of those that are affected; apparently even charity/life safety organisations such as the RNLI also pay on similar terms!

70cms activity – interim report

In the last issue of CQ-TV, our Chairman mentioned in his leader article our dilemma concerning the continued use of AM FSTV on 70cms. Other specialist interest groups have, for many years, cast acquisitive eyes on the part of the band that is available to ATV and it is now being suggested that the actual level of ATV activity on the band is very low/non existent!

This argument is quite difficult to counter, as, by its very nature, such activity is very localised. It also seems that there are few reports of such activity in the magazine or any other, few contest reports for 70cms and little by way of "latest DX" news either.

Hence Trevor's request for some hard evidence of usage around the country. We must obviously maintain our presence but we need the ammunition to fight with!

So far (as at 10th Feb), Graham G3VZV has received just three responses! We HAVE to do better than that for otherwise our apathy will be interpreted as disinterest and we will not be able to retain our present access or even the opportunity to use wide band digital modes for video when they become economically viable.

Therefore, it is a repeat of the old adage "USE OR LOSE" but with the addition of "AND TELL EVERYONE ABOUT THE ACTIVITY"

G3VZV's contact information can be found on the Committee contacts page.

If you have any information, views or comments you are strongly requested to pass them on to him without delay.

4 Channel Video Switcher with a Programmable Sequential facility.

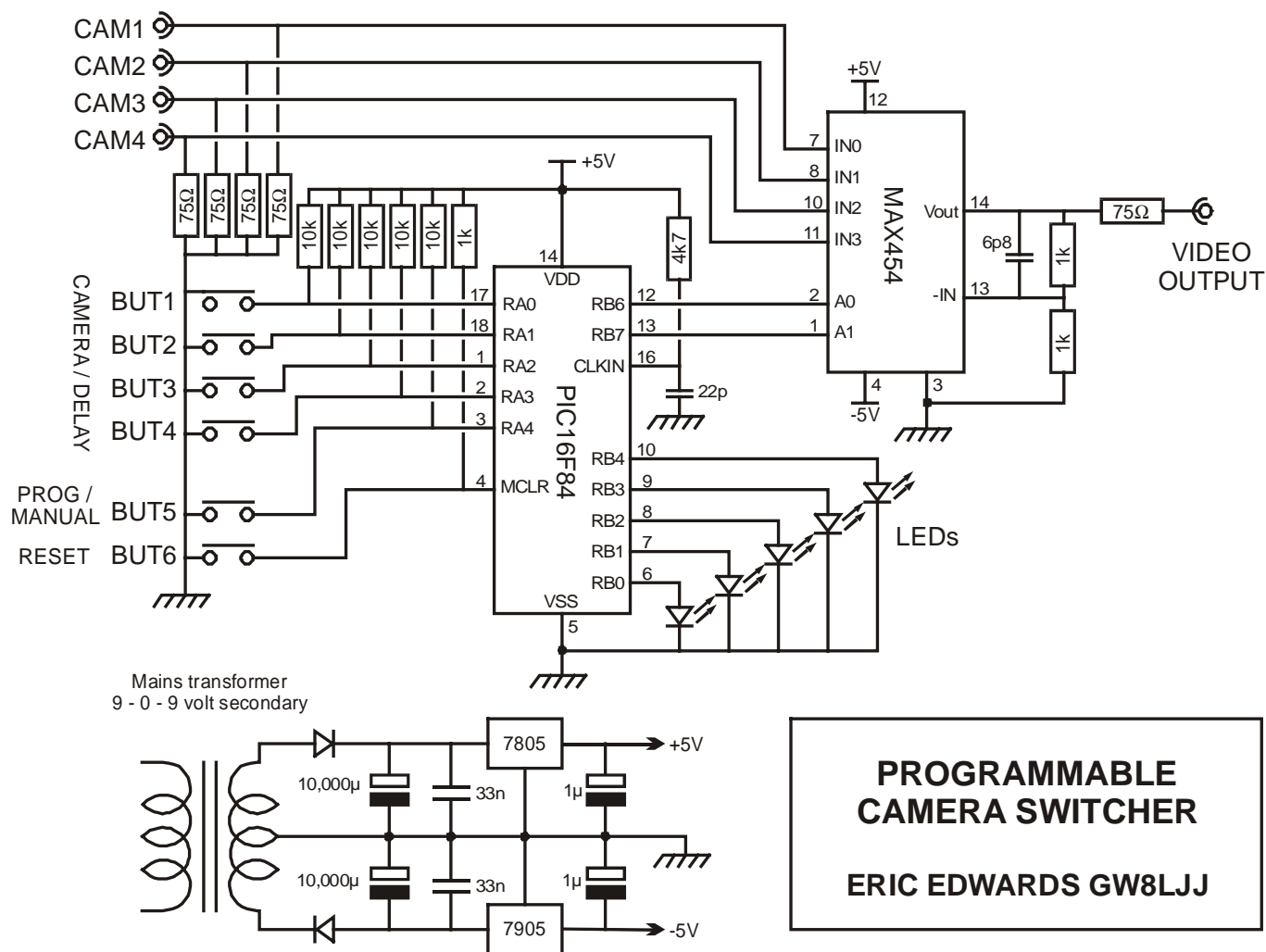
By Eric Edwards, GW8LJJ

There have been many designs for video switchers throughout the pages of CQ-TV over many years. I have built some of these, as well as designing my own for a specific purpose, all giving good results. However, the component count has been relatively high due to the use of momentary switch buttons with some form of illumination (usually LED's). A latch circuit, re-set and BCD conversion are all required to make a simple 4-channel video switcher. The circuits to be described will provide the above simple switcher plus additional features and will use less components than previously designed circuits. These features are: -

- A 4 level delay between video changes.
- A re-set button to start a different sequence.
- A manual intervention to control the video switching.

All this is possible with the use of a pre-programmed PIC integrated circuit. It's not expensive either, because I am offering a pre-programmed device for the TV amateur at a cost of £6 including post. The device is a PIC 16F84. This is the heart of the programmable switcher and only requires a couple of extra components to complete the unit.

family of devices in the amateur electronics and television world. The PIC has been programmed with the help of a works colleague, Neil (Jasper) Roberts. He taught me the 'grown-up' way of programming these devices. There are four cameras (or other video inputs) available, selected by momentary push buttons. Under conventional circuitry, these buttons would have to be fed into latches and have a re-set pulse to cancel non-selected inputs. All this is done, however, within the PIC via the software. LEDs indicate the video source selected and a BCD output from the chip is connected to a Maxim 454 CMOS video multiplexer circuit. The four video channels are selected by offering 0s and 1s to the A0 and A1



**PROGRAMMABLE
CAMERA SWITCHER**
ERIC EDWARDS GW8LJJ

- A normal change of 4 video sources.
- A programmable change of video sources with as many variations as required.

In Theory

The switcher is controlled by a PIC - which is a Peripheral Integrated Controller. This device is very useful and I can see a lot of potential with this

inputs to this chip. As well as selecting cameras by pushing the desired buttons, it is possible to program camera changes in any sequence you want and a range of delays (the time the camera stays on) can be selected whilst in the

sequential running mode.

In Practice

The circuit can be built on stripboard or on a custom designed printed circuit board. With all video circuits it is essential to keep all wiring and component leads as short as possible to avoid stray pick-up and other problems. It is prudent to fit a 20-pin IC holder for the PIC chip to avoid damage and the same could also apply for the Maxim chip although a 14-pin holder is used here. The reason for the PIC being placed in a holder is because it would be a simple matter to update the switcher by altering the software in the future.

There are six push buttons in the circuit, with five of them doubling to provide a second function. Once the circuit has been built and all video sources and the power supply have been connected, it is time to try out the unit. On switch on it is in manual mode (defaults, to use a modern term) and requires a button to be pushed. Push camera buttons 1 to 4 and the four video sources should change on the monitor. At this stage it is worth mentioning that all the video sources must be the same signal voltage i.e. 1-volt pp. (0.7v video and 0.3v composite sync). This applies with whatever switcher you use, unless it is an adjustable multiple input type. If button 5 is now depressed it will have placed the switcher in the programming mode. At this point the camera LEDs will be extinguished and the 5th LED (programming LED) will light. Press the camera buttons in any order (you will see the programming LED pulse every time you push a camera button), say 1, 4, 2, 3. Then press the 5th button again. You will now see that the cameras are changing by themselves in the order you just programmed. Whilst

it is still running at approximately a half second change, push camera button 1 once and the rate of change will be approximately a one second change between cameras. Pushing button 2 will give a longer change and even longer by pushing button 3. Button 4 will give about a five-second change of video shots. You can select any one of these buttons to give a delay of your choice (between about 1 second and 5 seconds). You can interrupt the sequential mode by pushing once again the 5th button. This cancels the auto mode and allows you to manually select your choice of camera. Pushing the programme/manual button (5th) again will resume your programmed choice. If you want to change this choice then push button 6, the re-set button, and this places you at the start again mode. It is possible to increase the cycle of events during programming. Re-set to start again. Push the programming button and as an example push buttons 1, 2, 3, 4, then 3, 2. This time the cameras will change in the order of 1, 2, 3, 4, 3, 2, and start all over again. If you had pressed say button 4 twice as in 1, 2, 3, 4, 4, 3, 2, then the 4th camera will stay on for twice as long or three times as long if you pressed it three times. You see, there are lots this simple circuit can do. Try doing all that with TTL or CMOS logic!

As stated earlier it is a good policy to fit the PIC in a holder and the advantage of this will be realised when you want to update your switcher. For example, you may want your cameras to change at a much longer rate. Perhaps you would prefer button four to be programmed to give a different rate of change. This is possible by reprogramming by me to your requirements (within reason)! A new chip will be supplied so you can keep your original set of events.

The heart of the switcher is a programmed device doing all the hard work. It would be possible and practical to replace the Maxim multiplexer with other devices if you want to. Although I have not tried it, it may be possible to connect a 4066 quad bilateral switch directly to the LEDs in place of the BCD circuitry. The BCD outputs from the PIC could be used to drive a two-line to four-line multiplexer or even one made up with OR and AND gates, then connecting that circuitry to a 4066 or similar device. If you have, however, a MAX454 then I suggest you use it for a more professional result.

The momentary push buttons can be the type that houses the LEDs saving fitting external ones. These switches are to be found on professional vision switchers, effects units and videotape editing controllers. Keep a look out at the ATV rallies.

I can, if necessary, provide a PCB ready tinned and drilled for £5 including postage. The resistor network at the output (Vout and -IN pins) can be adjusted for gain. The two resistors could be replaced with a 2k2 or 4k7 pot with the slider connected to the -IN contact and one end to ground with the other connected to Vout.

The way forward in electronics is definitely with programmable chips and, in my opinion, in years to come there will be re-programmable membrane circuit boards. Identical boards will be programmed to do different jobs.

If you wish to order a PCB, or have any other comments, Eric can be reached at 11 Old Village Road, Barry, South Glamorgan, CF62 6RA, UK.

The new A4 format, from the Membership Secretary's post bag.

Many thanks to all of you who took the time to comment on the new A4 format for CQ-TV. The comments so far are very positive towards the new format. Reproduced below is one that I particularly liked from a long-standing member.

"I shuddered when I first saw the new glossy A4 format CQ-TV. I have never really recovered from the move from the 1970's format but on opening the latest offering I discovered that I could read the print once again. Just the boost which three score plus year's vision

requires.

Congratulations to all concerned with the transformation. Let's hope all feedback will be complimentary."

BATC Publications

Publication	Each	Qty	Total
An Introduction To Amateur Television (225gm)	£5.00	.....	.....
The latest handbook full of detailed information on how to set up your ATV station, plus lots of new video and RF construction projects.			
Slow Scan Television Explained (275gm)	£5.00	.....	.....
The latest SSTV handbook detailing all the information you need to enter the fascinating world of Slow Scan Television: Basic principles, explanations of all the modes to date, commercial hardware and computer-based SSTV systems. Also various construction projects for SSTV equipment.			
The Amateur TV Compendium (155gm)	£3.50	.....	.....
The BATC handbook featuring construction articles on video units, 24cm and 3cm ATV, a Digital Frame Store, and much more.			
The Best of CQ-TV (150gm)	£3.50	.....	.....
A compilation of the best construction articles from CQ-TV's 133 to 146			
CQ-TV Back Issues:	£1.50	.....	.....
The following issues are still available. Please circle those required: 142, 143, 144, 147, 150, 153, 154, 156, 158 159, 162, 163, 164, 166, 167, 168, 169, 170, 171, 173, 174, 175,176, 177,178, 179, 180, 181.			
Special Offer: Any four of the above issues	£5.00	.....	.....
182, 183, 184, 185	£2.50	.....	.....
Index on a PC format disk (25gm)			
This item has now been discontinued, as this index is included on the BATC CD.			
CQ-TV Binders (A5 sized)	£3.50
The BATC CD (IBM type PCs only)	£5.00

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Publications orders *ONLY* to: **BATC Publications, Fern House, Church Road, Harby, Notts., NG23 7ED, England.** Tel: 0152 270 3348 (Evenings/Weekends only please).

E-mail: publications@batc.org.uk.

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Members' Services

A description of the various PCB's and components can be found in the 'What's What' guide, or on the BATC Internet pages. URL <http://www.batc.org.uk> (A printed copy available on request, if you send a S.A.E.). Components for club projects are not available from Members Services unless contained within these lists. All club crystals are HC18/U (wire ended). To avoid delay and inconvenience, please be careful to include the correct payment with your order – please do **NOT** send stamps or cash. Post and packing costs are for despatch of one item to United Kingdom members.

Circuit Details can be found as follows:

Revised ATV Handbook (vol. 2): PCB's 21, 22. **An Introduction to ATV:** PCB's 10, 25, 36, 40, 41, 47, 85, 86. **TV for Amateurs:** PCB 19. **Slow Scan TV Explained:** PCB's 59, 60, 61, 62. **Amateur TV Compendium:** PCB's 12, 27, 54, 55, 56, 57. **CQ-TV (Issue No. in brackets):** PCB's 7(174), 13(128), 16(134), 20(130), 26(142), 58(139). Item 46 is supplied with circuit details, etc

CAMERA TUBES A tube guide appears in CQ-TV 149 and 150. Tubes are now difficult to obtain and members requesting information on availability, prices or other types of tubes or equivalents are asked to send a stamped addressed envelope for their reply.

	All prices in UK pounds (£)	Each	P&P	Qty	Total
Camera Tubes, Scan Coils, Bases & Lens Mounts					
3	One inch Vidicon base	£1.20	£0.30	.....	.....
4	2/3 inch Vidicon base	£0.80	£0.30	.....	.....
6	Camera tube (see note above).....	*	£1.20	.....	.....
Video and I²C Circuit Boards/Components					
7	Sync pulse generator PCB	£12.00	£0.43	.....	.....
12	Teletext pattern PCB**	£3.50	£0.43	.....	.....
13	Greyscale/Colour bar generator PCB.....	£3.50	£0.43	.....	.....
16	PAL colour Coder PCB**	£7.00	£0.43	.....	.....
19	Video filter PCB	£1.20	£0.30	.....	.....
20	Video processing amplifier**	£4.70	£0.43	.....	.....
21	Vision switcher matrix**	£4.70	£0.43	.....	.....
25	4 input TEA5114 vision select PCB**	£3.50	£0.43	.....	.....
26	Video level indicator PCB	£5.90	£0.43	.....	.....
40	I ² C CPU PCB.....	£10.00	£0.43	.....	.....
41	I ² C VDU PCB.....	£10.00	£0.43	.....	.....
42	13.875 MHz crystal.....	£4.70	£0.30	.....	.....
70	6.0 MHz Teletext crystal	£1.75	£0.30	.....	.....
43	SAA5231 genlock IC.....	£8.80	£0.30	.....	.....
44	SAA5243PE Teletext IC.....	£14.70	£0.30	.....	.....
45	PCF8583 Clock IC.....	£7.00	£0.30	.....	.....
39	LM1881N Sync separator IC.....	£3.50	£0.30	.....	.....
81	I ² C 27256 EPROM	£9.70	£0.30	.....	.....
36	I ² C Video switch PCB	£8.80	£0.43	.....	.....
37	GX414 Video switch IC	£8.80	£0.30	.....	.....
38	PCF8574P Input expander IC.....	£4.70	£0.30	.....	.....
10	I ² C Relay PCB	£6.50	£0.43	.....	.....
9	PCF8574A Input expander IC	£4.70	£0.43

	All prices in UK pounds (£)	Each	P&P	Qty	Total
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50	108.875 MHz crystal.....	£8.20	£0.30
86	24cm solid state amplifier PCB	£10.50	£0.43
55	Gunn diode modulator PCB.....	£3.00	£0.43
56	10Ghz head unit PCB set**	£3.00	£0.43	.....	.....
57	Tuneable IF PCB**	£3.00	£0.43	.....	.....
88	XR215 phase locked loop IC.....	£5.00	£0.30	.....	.....
60	G4ENA colour etc. SSTV mod PCB set.....	£5.90	£0.43	.....	.....
61	G4ENA SSTV transmit mod PCB.....	£7.00	£0.43	.....	.....
62	G4ENA auxiliary PCB.....	£2.35	£0.30	.....	.....
68	4.433618MHz crystal.....	£3.25	£0.30	.....	.....
69	5.0MHz crystal	£3.25	£0.30	.....	.....
46	4 Rail power supply PCB.....	£3.50	£0.43	.....	.....

Stationery & Station Accessories

73	BATC blue diamond clutchpin badge.....	£1.75	£0.30	.....	.....
74	BATC cloth badge	£4.00	£0.30	.....	.....
75	BATC equipment label (6)	£0.25	£0.30	.....	.....
76	BATC square windscreen sticker.....	£0.10	£0.30
78	BATC test card	£0.50	£0.43
79	BATC reporting chart	£0.10	£0.43

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01384 894512 7-9pm weekdays

As Easy As ABC

Dicky Howett recalls a little piece of ABC Television at Didsbury.

In a residential street on the outskirts of Manchester, television history has been demolished. The erstwhile home of ABC Television is no more (you remember ABC Television? ---come on now, that was back in the days when ITV was ITV!). Demolition, it seems, is the pre-ordained fate of most pioneer TV establishments. For example, A-R TV's Wembley got razed. Lime Grove bit the dust and Alexandra Palace could easily be lined up to tumble. However, redundancy is the name of the game and sentiment doesn't enter the balance sheet.

Armchair Theatre

The aforementioned ABC TV home was originally a cinema called the ABC Capitol, and it was situated in Parrs Wood Road, Didsbury, Manchester. All that now remains of this television studio is an unexciting pile of non-televisual rubble. The Capitol Cinema once stood proud as the northern headquarters of ABC Television with its famous top-rated flagship drama programme, 'Armchair Theatre'.

The Capitol at Didsbury was not the first choice for ABC Television. Hasty

conversion of ancient theatres and cinemas into television studios was not ideal. But the management of the (then) new commercial television companies couldn't afford to be fussy. ABC Television had to be 'on air' at the advertised date. Advertising cash dictated that!



ABC's OB fleet at Didsbury

Howard Thomas in his book 'With an Independent Air' recounts, "We were due on the air in the North on 1st May 1956, three months after our Midlands opening. Lancashire was already promising to be a county of television addicts. ABC cinemas had several white elephants in the region, which they would be happy to sell. One of their largest and best equipped cinemas (and one of the emptiest) was the Capitol at Didsbury which had been built as a combined cinema and theatre at a time when the industry was augmenting its film shows with lavish stage spectaculars.

This was the sixth cinema in the Manchester area I had visited. As I climbed to the projection booth high at the back I realised that this theatre, with its ample stage and auditorium, with dressing rooms and other facilities, was the right place for us. Adjoining was a vast car park, ideal for the

housing of our three outside broadcast units and their satellite vehicles. But I did not regard ABC Television as fully on the air until we had the Manchester studios in operation. It was a tight schedule and our engineers, some of them poached from Marconi's, worked all night to complete the final wiring of the Didsbury control room. We also constructed the main studio floor above the roomy stage and into the stalls, still leaving room for an audience that could be intimately close to the performers. The outside cinema auditorium became one large television studio, with a second and more compact studio at balcony level, where we were able to produce less ambitious programmes such as panel games and advertising magazines".

Handy Pub

The main studio (Studio 1) was approximately 100ft x50ft. It was also a rather irregular shape. However, the studio was a convenient production base with all amenities on tap, not least a handy pub called *The Parr's Wood* located directly opposite the studio. After transmission, pressured thespians could (if they so desired) relieve tv tension at the drop of a pint. Famous stars of stage and cinema could be glimpsed often at weekends tottering across the road for a swift fag and a G&T. Unfortunately, the rigors of live weekly drama could take their toll. Actors could literally die for their art, as happened once at Didsbury during a 1958 live 'Armchair Theatre' production entitled 'Underground'. An actor expired between 'part one' and 'part two', leaving the director William 'Ted' Kotcheff with no option but to wing it for the remainder of the play.

Eventually, ABC television drama production moved south to Teddington. The northern base was retained as an OB site and local programming facility. Latterly, when ABC and then Thames disappeared into the electromagnetic spectrum forever, the redundant Didsbury Capitol studios reverted to student-theatre use, run by Manchester Metropolitan University. Alumni included Julie Walters.



Studio One at Didsbury.

An MF controlled switch unit

By Brian Kelly

Like most of my projects, this unit started its life as a scribble on scrap paper. It was designed and built in a hurry and the scrap paper was never turned into a proper document package. Please forgive any discrepancy between the description and reality as I've had to write this from a two and half-year-old recollections and some reverse engineering. The PCB layout and PIC program were, however, safely archived.

gap in the valid command sequence 'for future developments'. In hindsight, this was a good idea as it left space for commands this design could use. The range of MF commands available is *50# through to *59# although this can easily be changed by modifying the source code and re-assembling the PIC program. The source is available from the BATC web site and on the BATC CD. Unfortunately, GB3XG uses single digit commands so for example, keying *52# would be seen as four individual instructions which could leave the repeater performing an unwanted

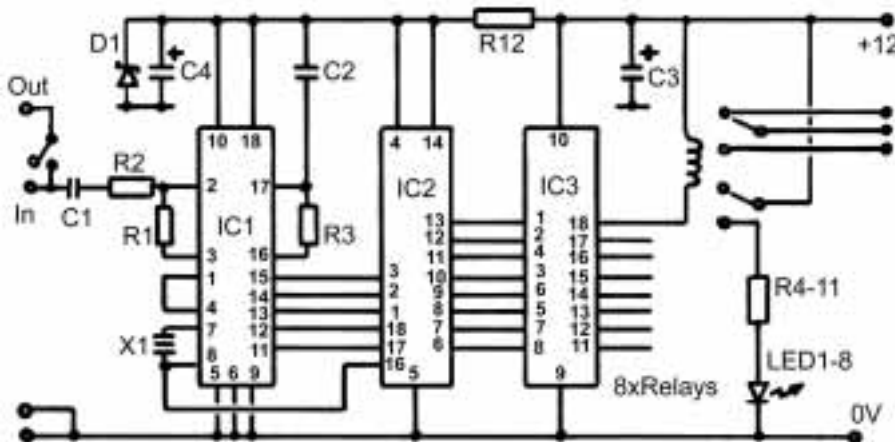
- *56# turns relay 3 on
- *57# turns relay 3 off
- *58# turns relay 2 on
- *59# turns relay 2 off (also turns off after 5 minutes period)

Relay 1 is used to interrupt the audio loop-through.

Circuit description.

The industry standard 8870 chip performs the decoding of audio tones to a binary number. This chip not only filters the audio but also uses a clever 'decision' process to check that both the necessary tones are present for at least 40mS. When it has decided that a genuine MF signal has been received it decodes it to a binary number and signals that it has done so by raising a 'tone detected' (strobe) pin. All these signals are fed to the 16C84 device which waits for the 8870 to send a strobe signal then reads the numbers in through port A. It then checks to see if the number corresponded with the '*' digit and if so, it disconnects the downstream audio feed by operating relay 1 and starts a 5 second timeout counter. If the following digits are in the 50 to 59 range and received within the 5 seconds, it drives the appropriate port B pins high or low. If the 5 second period runs out before the remaining digits have been received it purges any that did get through and turns the audio back on again.

The port B pins are capable of driving the relay coils directly but would be pushed close to their limits to do so. To ease the strain on them, a ULN2803 driver transistor IC used which also has the benefit of having a diode clamp on each of its outputs, eliminating the need to add a diode across each relay coil. The remainder of the circuit consists of LEDs and current limiting resistors to show which relays are energised; they can be omitted if desired. The unit runs on a 12 volt supply but can be modified to run on 5V if the relays are replaced with ones having a 5V coil rating, the zener diode is removed and its series resistor replaced with a link. I have not tried this and although it is technically feasible, there could be problems with switching spikes from the relays and PSU borne noise upsetting the tone decoder and PIC chips.



The circuit diagram

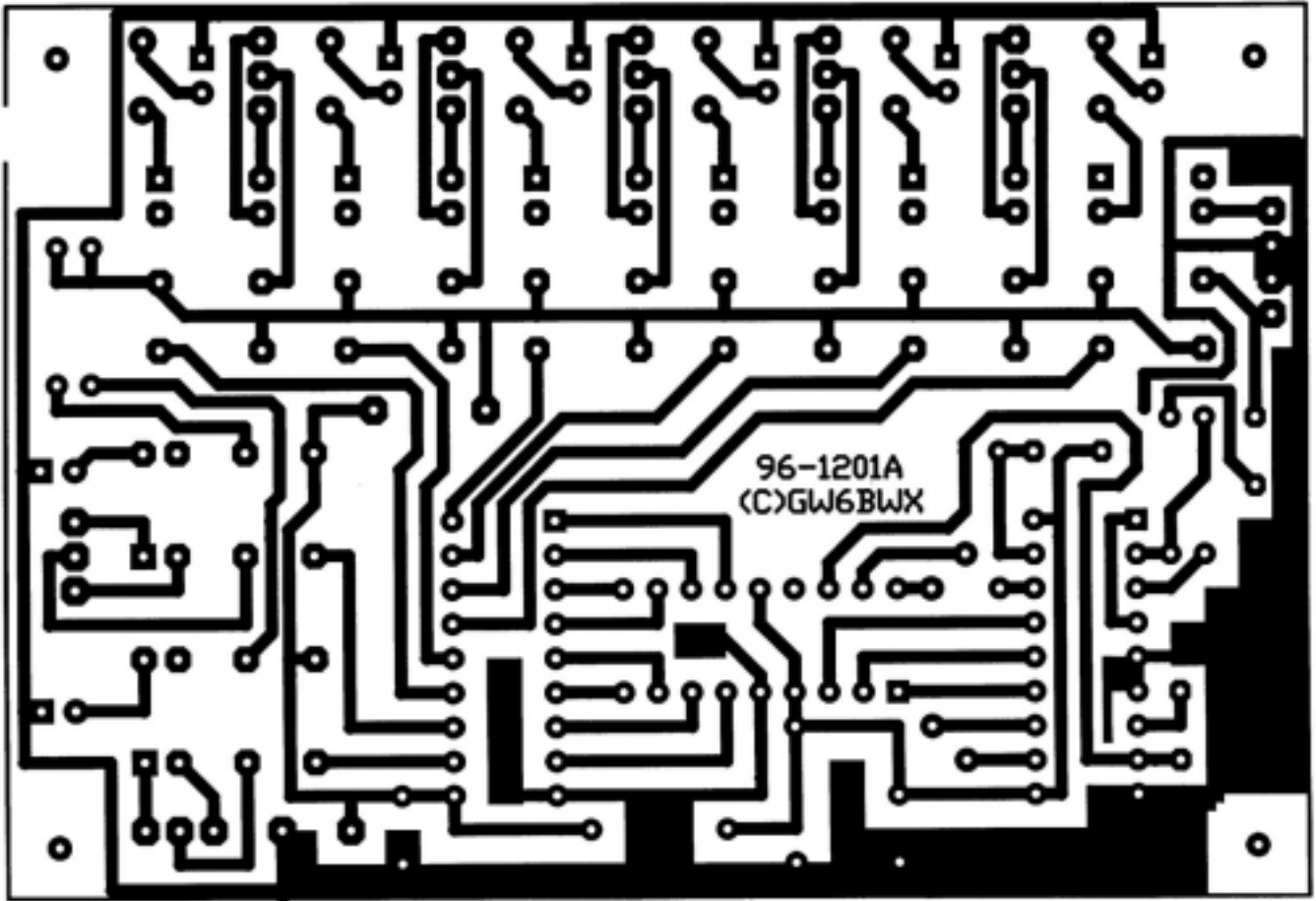
I was asked to design a unit that could be used to control monitoring equipment at a repeater site. It had to accept commands sent as DTMF tones over the repeaters audio channel and be able to switch either AV signals or power supply feeds at currents up to 1 Amp. The switching requirements left no option but to use relays and the cheap and easily available 'BT53' style was chosen. As these are two pole relays and only one pole was called for, the other was put to use to drive a monitoring LED. The LED is illuminated when the relay is energised. It would be simple to modify the wiring to allow both poles to be used if the LED facility is not needed.

The design specification stated that the unit should co-exist with other MF controlled equipment, specifically the single MF tone pair commands that GB3XG used and the four MF tone sequence used by GB3ZZ. When I wrote the operating system for GB3ZZ almost a decade ago (when I had far fewer grey hairs!) I deliberately left a

action. To overcome this problem, the audio feed to the repeaters existing MF decoder had to be disconnected as soon as the '*' was seen and then reconnected after the '#' was received. One of the relays is used for this purpose. The audio is looped through the board and interrupted for the duration of the command sequence. All the other relays have changeover switch contacts (note: SK6 & 7 have reversed pins) are available for general-purpose use. To make the unit as versatile as possible, the relays are operated in different ways. Some are selectable as 'one of four', some are turned on with one code and off with another and one relay has a timed on period before switching itself off.

The actual commands are:

- *50# turns relay 8 on, 5,6 & 7 off
- *51# turns relay 7 on, 5,6 & 8 off
- *52# turns relay 6 on, 5,7 & 8 off
- *53# turns relay 5 on, 6,7 & 8 off
- *54# turns relay 4 on
- *55# turns relay 4 off



Copper layout – not actual size

Construction

The PCB artwork file in printable format is included with the source code. Apart from the usual static precautions, there isn't much to advise about building it. The 16C84 must be programmed before use and be set to its 'XT' crystal configuration. It actually gets its clock from the generator inside the 8870 but setting it to XT mode will

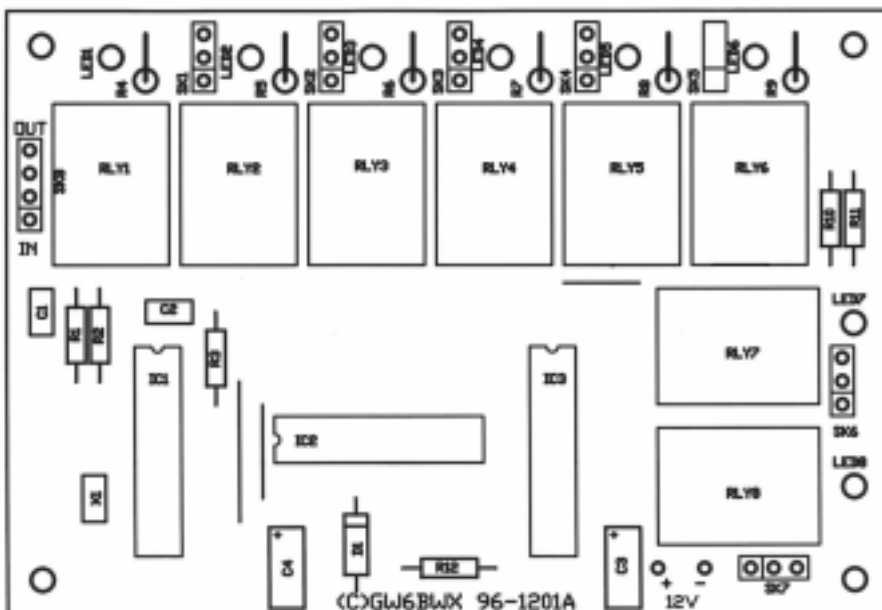
ensure the on-chip oscillator doesn't try to start up. The original unit used 0.1in Molex type connectors but Veropins could be employed or even just soldering wires to the board is acceptable. Remember to connect the audio input and output pins the right way around or the unit will always disconnect itself and never hear more than a single tone!

Components list:

- R1, R2 100K 0.25W
- R3 330K 0.25W
- R4 - R11 1K 0.25W
- R12 470R 0.25W
- C1, C2 100nF
- C3, C4 10uF 16V Tantalum bead
- D1 BZX88 C5V1

- X1 3.579MHz ceramic resonator (Maplin DJ31J)

- IC1 MV8870 or HT9170 (Maplin AZ12N)
- IC2 16C84 (Maplin AY31J)
- IC3 ULN2803 (Maplin QY79L)
- LED1 – 8 Red 0.2' LED
- RLY1 – 8 BT53/3 style (Farnell 280-537 or Maplin DC33L)



Component overlay

Note: The software to accompany this article can be downloaded from the software page on our web site at www.batc.org.uk/software.htm – ED.

In Retrospect

12GHz prescaler, CQ-TV 185, page 11.

There are some other points.

1. I didn't mention anywhere in the script what the maximum input RF level is. Although I mentioned a limit on input level under "Conclusions- limitations point 3". In fact the Fujitsu data sheet shows correct operation when the input power level is between 0.1mW and 10mW. (The chip has an absolute maximum rating of 20mW input power). There would be little problem checking low power Gunn diodes where the prescaler is particularly useful. With high power Gunn diodes some care will have to be taken not to overload it. I use the horn input via a

WG/SMA transition if in doubt about power level.

2. I built the "Off air frequency standard" by John Lawrence GW3JGA. I constructed mine on Vero board and have used it to check and calibrate my frequency counter. This is a very useful unit and I have found it to be essential when setting up Narrow Band units on 3cm and above where I can now set the frequency to within a few hundred Hz without too much trouble. It is now my intention to rebuild this unit using a PCB and put it in a proper box. However there doesn't seem to be a PCB available for this unit. Any information on sources would be appreciated. If I can't find a

suitable PCB or PCB layout, I will design one and you can have a copy for your site.

David Wrigley, G6GXX



The correct email for the 13cm 23 cm TX in CQ-TV185, page 22, is eisch-electronic@t-online.de

The name of the company is Eisch Elecronic, Abt-Ulrich-Str.16, 89079Ulm. Tel 07305 23208 Fax 07305 23306. The Price is 295 DM Richard Parkes G7MFO.

Experimental Amateur Digital TV

By Vic Brown, G3SDQ

You may be interested to hear that I have had some success in transmitting MPEG-1 digital television on the 70cm band.

In the system I used, I simply took the RF signal from the pick-up head of a CD player and transmitted it via a more or less conventional AM VSB modulator, with the input video clamp disabled. For the receiver I used the one shown in the Amateur Television Handbook feeding an EFM interface and MPEG-1 decoder from Maplin Electronics.

Although the bit rate recorded to disc on a Video CD is around 4.3Mbit/s, I have found that the baseband RF bandwidth is only around 1.5MHz because of the eight-to-fourteen modulation (EFM), which considerably reduces the number of bit transitions per second. Thus, Video CD quality MPEG-1 video and stereo sound can be transmitted in a very reasonable amount of RF bandwidth.

Since the system uses a single carrier rather than OFDM, it does not have any inherent anti-ghosting characteristics, but this may not be important over typical paths between amateurs. So far

I have only transmitted the signal across the room using a pre-recorded Video CD. However, greater distances should be possible with more power (I was only using around 1mW), and real time video, rather than pre-recordings, should be possible using one of the MPEG-1 encoders that are becoming available.

In the future, OFDM transmission, perhaps using MPEG-2, may become within the reach of amateurs, but this simple system provides an easy introduction to digital TV for the experimenter.

New ATV Software for the PC

You will be pleased to know that PC-ATV has been written and is available for free download from: www.arcadeshop.demon.co.uk/atv

This program generates dozens of different test cards, to brighten up any amateur ATV broadcast. Program size is 1.5MB and it can run on any PC with Win 3.1 or Win95 or Win98 or NT.

Note: This updated version is also available for our web site at www.batc.org.uk/software.htm – ED.

By John Lawrence, GW3JGA

DTMF Controlled Eight Input Video Switcher

This issue of Circuit Notebook describes a DTMF (Dual Tone Multi Frequency) controlled video switcher which has a preview output in addition to the transmission output and includes facilities for controlling the ATV transmitter.

A block diagram of the system is shown in Fig. 1. The DTMF signal is applied at the input, either directly from a keypad or received by wire or over the air with the signal taken from a receiver headphone socket. Most handheld VHF/UHF transceivers have a built-in DTMF keypad.

The DTMF signal is decoded into a 4-line address and this is fed to either, or both, video multiplexers and each multiplexer routes an input video signal through to its particular output. In this way, one output provides a 'preview' signal and the other is the 'transmission'. An LED numerical display is provided to show which input video signal is routed to each output channel.

The purpose of the switcher, as far as I am concerned, is to provide remote control of my station. This is located in an outdoor shack and I wish to operate from the house during the winter months. In addition to changing video sources remotely, I also need to switch the transmitter on and off. The system must also be usable in the shack without modification.

DTMF Control

The usual DTMF keypad has 12 keys, 0 to 9, * and #. These did not provide enough options, but I resisted using keys A, B, C & D, because it would have needed an extended keypad and reduced the flexibility of the system.

After some experimentation, a system evolved which provided the following facilities: -

Key	Function
1	Input 1
2	Input 2
3	Input 3
4	Input 4
5	Input 5
6	Input 6
7	Input 7
8	Input 8
9	Transmitter ON
0	Transmitter OFF
*	Transfer preview > transmission
#	Lock preview & transmission

Transfer and Lock require some explanation. Assume that you have keyed input 2 and input 2 is outputted to the preview monitor. On pressing '*', the signal on input 2 is now outputted to the transmitter also.

You are now free to key around other inputs for viewing on the preview monitor whilst leaving the transmission from input 2. On locating a new source, say input 3, this can be transferred to transmission by keying '*'. The preview signal is only transferred to transmission when the '*' key is pressed. This mode of operation would be used in the shack.

When operating remotely, it is more convenient to dispense with the preview facility and switch the selected video input to the transmitter directly. To do this, the '#' key is depressed and from then on the two multiplexers are locked together and the keypad operates both simultaneously. Depressing '*' unlocks the circuits and they return to the normal preview > transmission operation.

Transmitter OFF/ON control is provided by keys 0 and 9 respectively. A relay is incorporated and this provides a contact closure to the transmit line linked to the transmitter. Because of where I live, almost all my 24cms contacts from home are through the local repeater GB3TM and so the aerial direction and receiver tuning are normally fixed.

Circuit Description

The complete circuit is reproduced in three parts, Fig. 2 DTMF decoding and logic control, Fig. 3 LED driver and display and Figs. 4 & 5 the video multiplexer and its P. C. board layout.

The DTMF decoding is performed by IC1 and its associated components, [1]. The decoded signal appears as a 4 line address which is fed to IC2, the 4-to-16 line decoder. When a valid DTMF signal has been received, IC1 provides a high signal at pin 15, this is converted into a 1 ms enable pulse by IC4a and its associated components. This causes the particular decoded output line from IC2 to pulse high for about 1 ms. The purpose of IC3 is to detect any key press in the range 1 to 8. If any of the outputs corresponding to the numerals 1 to 8 pulse high then the output of IC3 goes low; keying any other character has no effect.

The 4 line address from IC1 is also connected to the 4 bit (quad) latch IC6. This remains in a latched condition until a numeral (1 to 8) is keyed, upon which the output from IC3 opens the latch and the input address becomes present at the output. The lower three bits of the address are fed directly to the video multiplexer IC8, thus selecting the required video input and the 4 line address goes to the numerical indicator driver IC10 causing the indicator to display the video input selected. However, when the '8' key is pressed, the indicator displays 8 but the multiplexer, having only 3 address lines, connects to input '0'. This input is therefore renamed input '8' and now everything works correctly.

Transfer and Lock

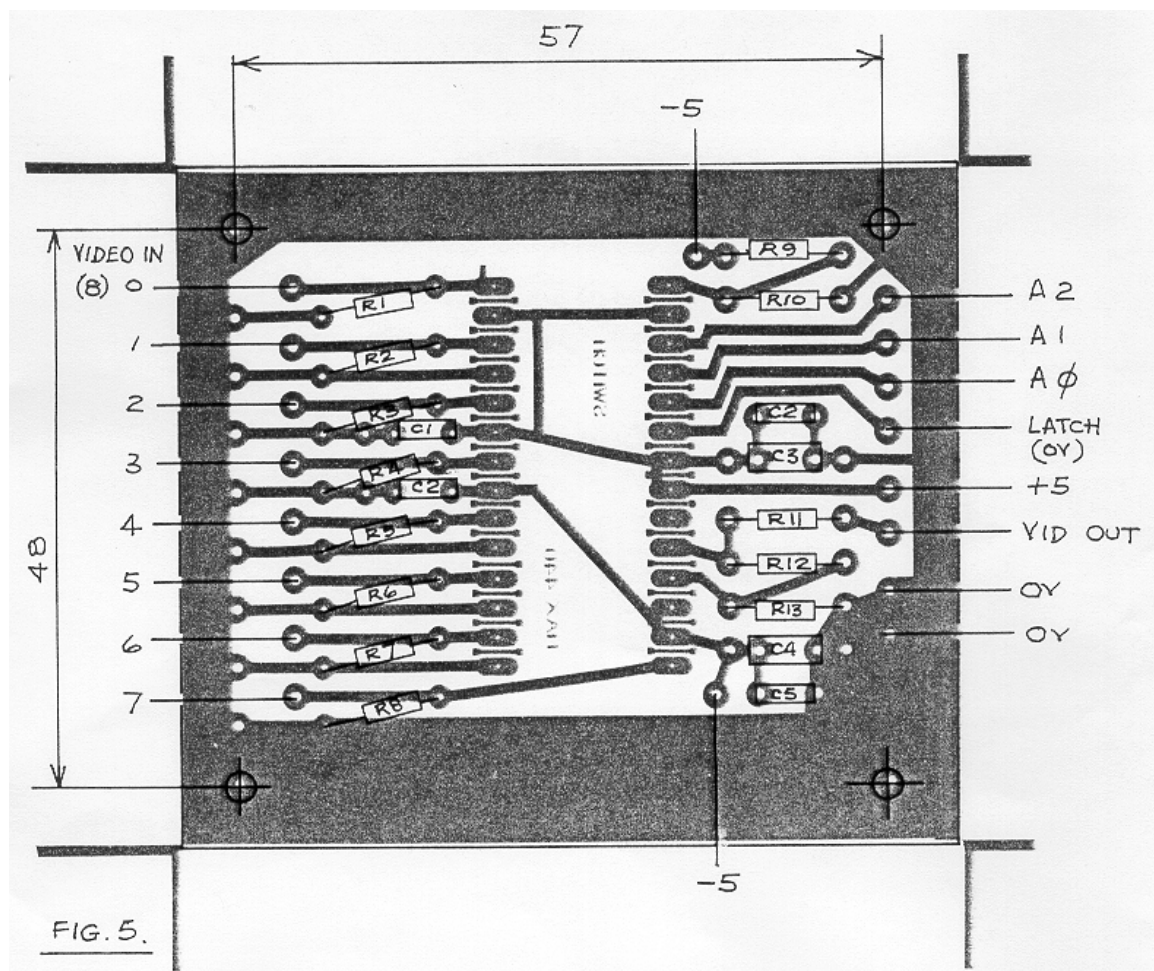
If '*' is keyed, IC2 pin 19 pulses high, this is inverted by IC4b and again by IC4c thus producing a positive pulse which is fed to the quad latch IC7. The 4 line address present on the output of IC6 and thus the input of IC7 is now transferred to IC7 output. As before, the lower three bits of the address control the video multiplexer IC9, which selects the required video input, and the full 4 line address goes to the LED driver IC11 causing the indicator to display the number of the video

input selected.

If ' #' is keyed, the pulse from IC2 pin 14 sets IC5b with the output low. This is inverted by IC4c to produce a continuous high level causing the quad

feeding an R.S. Components common cathode seven segment LED display, type RS 587-383. An alternative type would be suitable providing it is a common cathode type. The two displays were built on a common strip

second P.C. board. The video input termination resistors, R1 to R8 are fitted to the second board only. Note that input 0 on the multiplexer P.C. board becomes input 8.



Construction

I built the video switcher into a stripped out 1U high 19-inch rack case. The power supply is conventional and uses +5V and -5V regulators. The DTMF decode and control logic is built on Maplin plug-boards, as this allows easy experimentation and modification if needed.

The LED drivers and displays are on Veroboard, as mentioned previously. The Maxim video multiplexers have their own

latch IC7 to appear transparent. When a numeral (1 to 8) is keyed, both multiplexers operate in synchronism as do the LED drivers and displays. This condition continues until the '*' key is pressed when IC5b is reset with the output high. This condition allows the address transfer to take place as described previously.

Transmitter Control

If '9' is keyed, the pulse output from IC2 pin 17 sets IC5a with the output high, this turns on TR1 and TR2 energising the relay RL/A and closing the transmitter transmit line. When '0' is keyed, IC5a is reset, TR1 and TR2 turn off, the relay de-energises and the transmitter turns off.

LED Numerical Display

The circuit of one of the two displays is shown in Fig. 3. The circuit employs a 4511 seven segment decoder-driver I.C.

of Veroboard and mounted behind two cut-outs made in the front panel.

8 Input Video Multiplexer [2].

Each of the two 8 input multiplexers consists of a Maxim MAX440 device; each is mounted on its own dedicated P.C. board. The circuit is shown in Fig. 4 and the layout of the P.C. board is shown in Fig. 5. The circuit and component values follow the recommendations given in the Maxim Data Sheet.

The MAX440 IC contains an 8 input multiplexer followed by a video op-amp, the gain of which can be set, by external resistors, to X2. This provides a suitable level of signal for driving a 75R terminated line from a 75R source (2V p-p into 150R).

The video signal inputs are taken to the inputs of the first P.C. board and then 'daisy-chained' to the inputs of the

dedicated P.C. boards which provide good earthing and allow adequate decoupling, which is necessary for correct operation.

Two audio inputs are provided, one for use with a modified Tandy DTMF keypad (3 pin DIN) and another for remote control by line, receiver etc (phono).

References

- [1] Mitel Application Note MSAN-108 Applications of the MT8870 Integrated DTMF Receiver. Mitel Telecom Ltd., Semiconductor Division, Mitel Business Park, Newport, Gwent NP6 4YR
- [2] MAX440 / MAX441 Data Sheet Maxim Integrated Products (U.K.) Ltd., Unit 3, Theale Technology Centre, Station Road, Theale, Berks RG7 4XX.

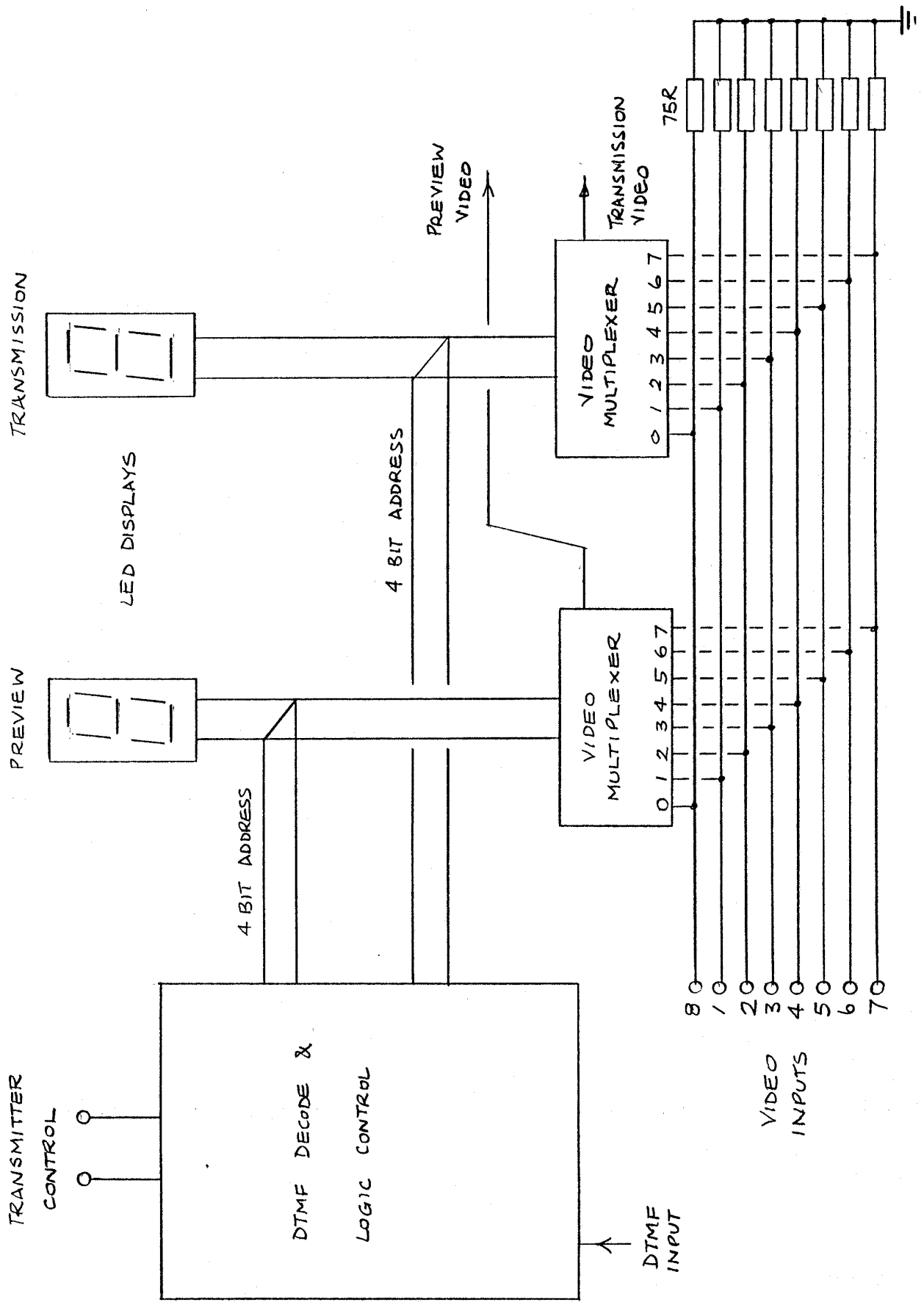
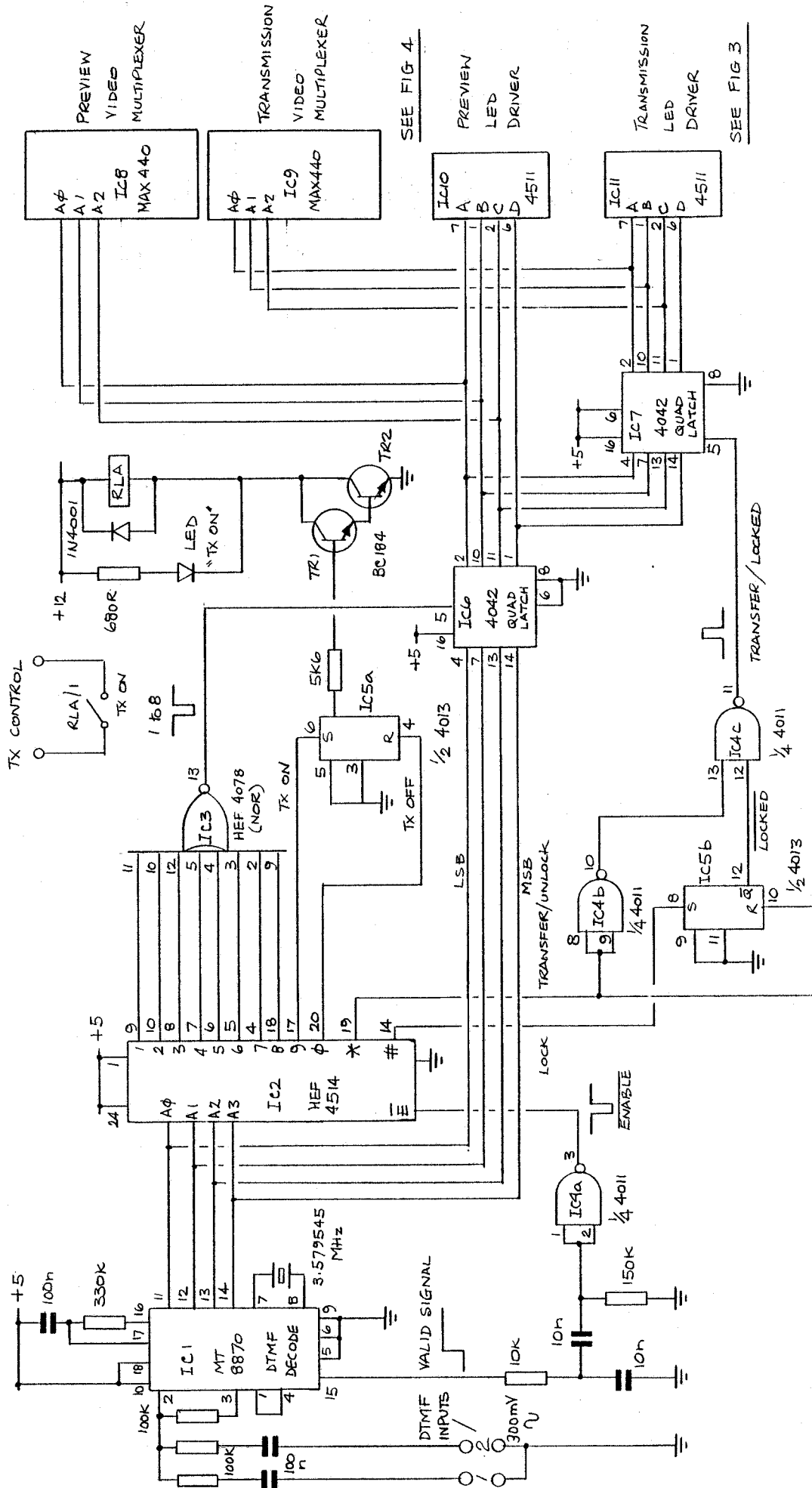


FIG. 1. BLOCK DIAGRAM



SEE FIG 4

SEE FIG 3

FIG. 2. DTMF DECODE & CONTROL LOGIC.

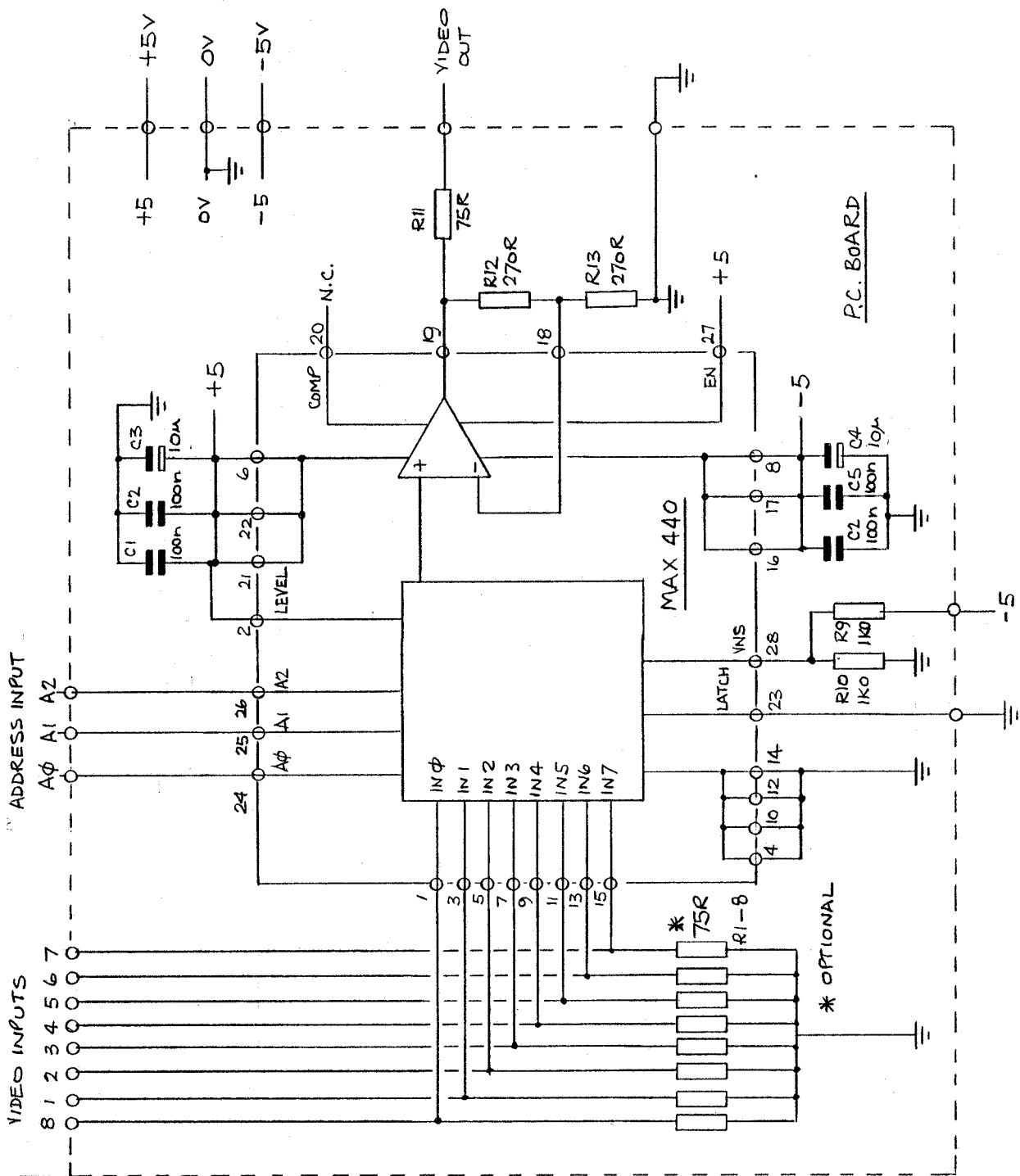


FIG. 4. VIDEO MULTIPLEXER

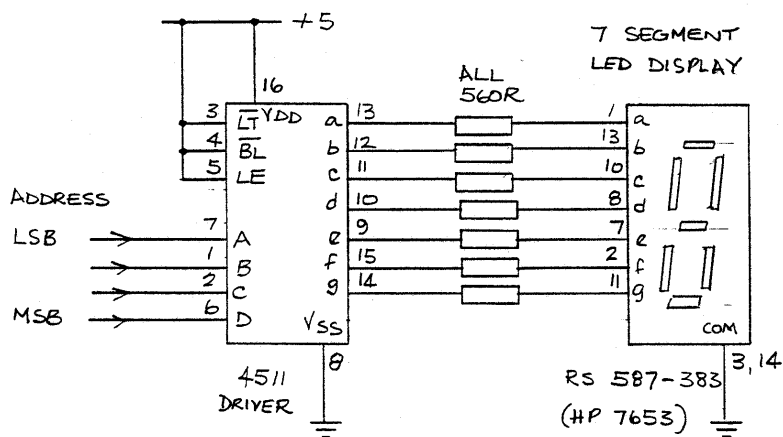


Fig. 3. Seven Segment Decoder-driver and Display

ONE OF TWO

Worthing & District Video



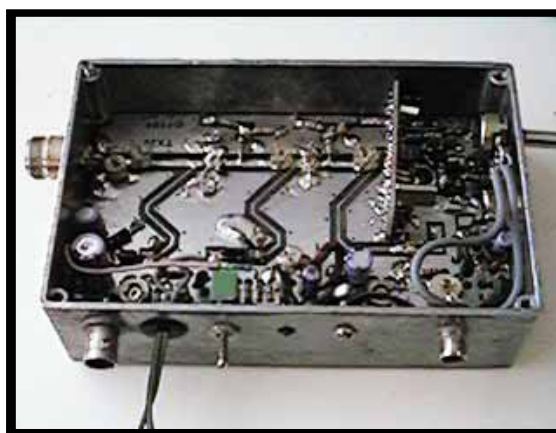
Repeater Group



GB3VR GB3RV & GB7VRB

1Watt FM-TV 24cms Transmitter

The 1 watt transmitter generates its signal at the wanted frequency which can be set anywhere in the band, colour or B/W. On board intercarrier sound and fixed pre-emphasis are standard features. The kit includes the PCB all the on board components, pre-drilled heat sink, an Eddystone Di-cast box and full and comprehensive instructions. Building time is three evenings work. The new price for this kit is £80.00, P&P £2.50. Over 750 units sold to the Amateur market alone.

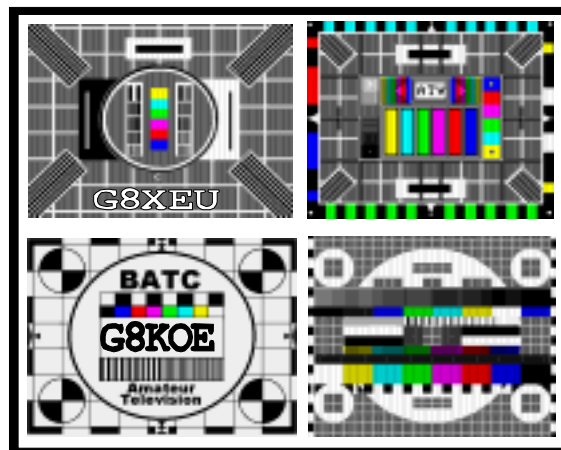


Two channel phased locked loop kit.

This add-on kit vastly improves the overall stability of the 1 watt transmitter. Two crystal locked channels and a third free running tuning position are available. Kit price £30.00

Amiga ATV Program-2

The New Amiga ATV program has more features than ever, up to 56 testcards, 20 wipes, superb text control, 30 screens of text messages, QRA calc, Testcard music, selectable displays, and this version has a DTMF tone pad to control your repeater. All testcards are over-scan i.e. the whole screen is used, Load in your own customised testcards, Extra large text, scrolling text, clock, callsign extensions, Hot key operation, Doc reader, ATV Cli, Cross Hatches, Purity and a comprehensive section for genlock users. For any Amiga with 1meg or more, state callsign and QRA (if known) when ordering, this three disk set is now only £10.00 P&P 75p



Spectrum ATV Program

Still selling after all these years, why, its good, its cheap and it works on all spectrum based machines. The 48k version has over 60 commands which include 7 Testcards, Memo pad, clock, maps, tones, QRA locator, various size printing, plus disk transfer routines and much more. Now only £5.00 P&P 75p

Visit the all new GB3VR-RV web site at: - <http://www.g8koe.demon.co.uk/>

Orders should be sent to:-

Treasurer of GB3VR, R. Stephens, 21 St. James Ave., Lancing, Sussex, BN15 0NN.
Cheques payable to "W&DVRG" Tel (01903) 765760, 7 to 8pm.

Hidden Hazards

Andy Emmerson, G8PTH, uncovers some of the nasties lurking in the workshop and ham shack.

Mercury, which is poisonous, is used as a getter to absorb any remaining oxygen molecules in valves; this is what causes the internal silvering on some valves. There are also some old rectifiers that used mercury in them; when the tube is cold, you can see little drops of mercury adhering to the inside of the glass. In any case, be careful not to break any tubes that have little blobs of silver liquid clinging to the glass.

The risk of radioactivity is sometimes brought up and it should certainly not be ignored. Some USA-made common voltage regulator tubes had radioactive isotopes added, apparently to achieve more stable operation, whilst a number of WWII-vintage tubes (voltage regulators and radar T/R switches) contain radium 226 in quite large amounts. Another source of radioactivity is the luminous paint containing radium used for dial markings on Second World War radios, such as the British Army's 19 Set. American military sets considered radioactive include: - ATD, BC-620, BC-654, BC-659, BC-1335, R-392, T-195, TBX and TBY.

Although post-war productions used a different, non-harmful luminous material, the original zinc sulphide and radium paint is now considered hazardous to health and, according to one report, one type of ex-Royal Navy ship's compass had to be recalled from the surplus market for this reason. Other equipment said likely to harbour radium paint includes the 18 Set, some domestic radios from the early 1950s with built-in clock/timers and American Jeep speedometers, also virtually all aircraft instruments through to the 1960s.

Radioactivity can even lurk in old hi-fi components. Sold at one time for turntable use was the Mercury Disc-Charger, a red plastic cylinder with a clip on its side, weighing half a gram, and a small metal square plated with about 1 microcurie of radium-226 mounted in a shallow recess on the end. It was very effective for neutralising static on records, and was used by

simply clipping it onto the front of the headshell. There was also a blue plastic teardrop-shaped version sold by a different company, but it contained a little less radium.

A considered assessment of the risks arising from radioactive equipment is fairly reassuring, thankfully. The first issue is potential exposure to radioactive materials when using our radios; this can be termed the irradiation hazard. The second issue is the risk of accidental ingestion of radioactive materials; we can call this the contamination hazard.

In practice, the irradiation hazard from most radios is minimal; the radiation dose rate at normal operating distances will likely be barely discernible above background levels. Good ventilation will minimise the hazard of inhaling radon gas given off by decaying radium. The contamination issue is very different though. There's no cause for concern if the radium paint is inside a meter where you can't touch it, but if it is on a front panel control, then a real possibility exists that you could wipe small amounts of radium off on your fingers, then eat or smoke, ingesting the radium. The same could happen if a tube containing radioactive material is broken. The small amount of material may not represent a significant health risk but it's a risk that's well worth avoiding.

With radioactive *markings* the best advice is to seal them with a coat or two of clear lacquer, to prevent picking up dust accidentally. They are easy to spot once you know what to look for, according to Lenox Carruth. Originally (and often on more recent equipment) the radium paint was light yellow in colour and appears thicker than the typical silk-screened markings. Old stuff now looks brownish and no longer glows. If you clean equipment with radioactive markings, you should wear rubber gloves and dispose of all rags, paper towels and gloves afterwards, sealing them in a Ziploc polythene bag. Do not store radioactive equipment where it will be in close proximity to people for long periods.

Beryllium oxide (BeO), found in some power transistors, VHF 'ceramic'

transmitting triodes and klystrons, is very nasty stuff (if you inhale just a few micrograms, you could be dead in a week or two). Luckily, if you avoid filing, sanding, or smashing the stuff, you are quite safe in handling it—large chunks are safe, micro-sized particles are dangerous.

Probably the best (and most obvious) advice is: don't put anything in your mouth; avoid handling broken glass, chemicals, or powders, using gloves when necessary; and work in a clean area with adequate light and ventilation.

Most of the 'ceramic' tubes and sockets encountered on amateur and commercial equipment do not contain BeO but the following Eimac/CPI tubes or sockets do contain it:

CV-8051, SK-3010, SK-3012, SK-3020, SK3040, SK-3060, SK3064, SK-3080, 4CS250R, Y621B and some klystrons, also certain power transistors.

BeO can also be found in the Signal One CX7 receiver and in some commercial amplifiers. But why all the fuss? Easy - the dust is extremely toxic when inhaled. It sets up an inflammatory reaction in the lungs. This leads to progressive pulmonary fibrosis where the lungs scar up and lose the sponginess essential to their function, and then you die of slow suffocation. A minute amount is enough to trigger the process and there is precious little treatment short of lung transplantation.

Oil-Filled Transformers and Capacitors

Many oil products are considered harmful if misused; some engine oils are carcinogenic and should not be allowed into contact with your skin. Other types, containing PCBs or Poly Chlorinated Biphenols, are deadly if allowed to overheat and vaporise. Older television sets contained many oil-filled products - high-voltage capacitors, transformers and EHT triplers found in projection sets - and these may contain PCBs. If these do not leak or overheat you have nothing to worry about but you should be aware that

environmentalists are extremely concerned about PCBs. Their use is banned in most situations nowadays and there are strict rules governing the disposal of products containing PCBs. To avoid the risk of skin cancer and other things too horrible to mention, wear rubber gloves when handling oil-filled devices. You have been warned.

Selenium rectifiers

Selenium dioxide is the major compound produced when a selenium rectifier is overheated. It can cause severe burns to the mucous membranes and severe respiratory tract, skin, and eye irritation. It can also promote allergic reactions with the skin. Fortunately it is not considered a carcinogen.

Another fortunate thing is the awful smell that gives it away. If you smell something really rotten, like decaying onions and garlic, coming from your equipment, it is best to leave the area immediately, opening some windows on the way out. Allow the selenium dioxide vapours to dissipate for several days before you go back – you will not want to go back very soon anyway!

Explosive charges

This, fortunately, is a low risk but still a real one. Military radio and radar equipment made during World War II and afterwards, in particular by the Americans and Germans, was sometimes fitted with explosive charges. These were intended to

destroy the equipment in the case of accident (impact) or capture by the enemy (tampering). In recent years at least one collector has seen his garden shed go up with a bang (spontaneous detonation) and another, to his horror, had an innocent-looking 'component' identified as a charge. Frequently these detonators look extremely similar in shape and size to electrolytic capacitors and issue 117 (1998) of *Funkgeschichte*, the German historical wireless society's magazine, has photographs which illustrate this similarity well. It also quotes a newspaper report of 1949 in which a domestic radio technician testing war-surplus radio components for re-use lost his sight when one of these 'capacitors' blew up in his face.

More traps for the unwary

Arden Allen points out that most, if not all, of the combined clean and lubricate preparations sold in aerosol cans have become more dangerous lately. That's because the manufacturers are replacing the conveniently non-flammable chlorinated hydrocarbon solvents (that help destroy the ozone layer) with more environmentally friendly flammable solvents. Read the label and look for the word Flammable. Flammable liquids burn when they are heated to the point where they evaporate fast enough to produce a combustible mixture of gaseous fuel and oxygen (the flash point). When you add the third ingredient of the fire formula, namely heat, you've got problems, so don't add the heat.

WD-40 is a typical example of these products and being a petroleum derivative, it is flammable (although its flash point is reasonably high and you need a pretty hot spark to ignite it). All the same, if you are using WD-40 to lubricate power switches, switch off the device first. Real fires have been started in this way. You can also start fires when certain switch cleaners (used for cleaning valve pins) soak into fibre or phenolic valve sockets if the cleaner has not had time to dry (being wet, it is conductive). Arden Allen advises that you cannot remove the ionic contamination out of the insulation once it is in. Even after you dry things out the insulation, being porous, will absorb moisture from the atmosphere and eventually it will fail due to tracking and then arcing. You should clean sockets, etc., only with cleaners designed for cleaning electrical equipment. If you are in doubt about the condition of the insulation, saturate it with a moisture displacant, such as WD-40, then to avoid any risk of fire, allow WD-40 (which contains flammable solvent) to soak in and then dry for several hours before doing anything like throwing a high voltage switch or unplugging tubes while the set is powered up.

This article is extracted from the author's book *Electronic Classics*, published last year by Newnes (ISBN 0-7506-3788-9). Containing more than 400 pages, it covers the field of collecting, restoring and repairing old radio, television, hi-fi and telephone equipment.



'Repeater' is the premier ATV magazine in Holland.

Repeater is a new ATV magazine published in the Netherlands in Dutch. The 13/24cms TX in this issue is reprinted from Repeater with the kind permission of the Editor Rob Ulrich PE1LBP. I hope we can from time to time bring you other extracts as we do with all the ATV magazines.

Information about 'Repeater' magazine can be found on their web site at <http://www.euronet.nl/users/rulrich>, email: repeater-nl@rocketmail.com

Snail mail:- Gibbon 14, 1704 WH Heerhugowaard, Netherlands.

Photo Gallery



Redundant plant growing in a forgotten corner of BBC's Woodnorton Hall circa 1968. A mighty Ampex VR1000 2 inch quad, curtained off to protect those of a nervous disposition.



Picture shows an ad for RCA and their colour camera the TK40 (1952/3)



Left:- Talkback – VTR remotes.

This picture, and those on the 2 inside cover pages, refer to the article about the MCR11 on page 13

Software upgrade for the Audio/Video Switcher project.

By Brian Kelly

Since the article first appeared in CQ-TV 175 I have been asked on many occasions to rewrite the program to use the PIC 16c84 device instead of the 16c54. The '54 are rather more difficult to program without special hardware but it is much cheaper than the '84. As a new feature had to be added to the switcher I use in my shack, I took the opportunity to not only update the functionality but to change to the more popular processor type. The new code

is available on the BATC Web pages and CD. If you already have one of the switchers, there is no need to upgrade it unless you need to create the "ABCD" tone codes that are not normally available on keypads. As this was specifically what I needed to do, the feature is now included in the new version and is activated by holding the "TO" tone selector key down while pressing one of the 1,4,7 or * keys. Holding the key down changes column 1 of the keypad into column 4 so the "1" key becomes "A", "4" becomes

"B", "7" becomes "C" and "*" becomes "D".

Because of the way the keypad is scanned, it is necessary to release both keys before making another selection. There are no hardware changes except for the microcontroller itself of course.

Note: A copy of this new software is available for download from our web site at www.batc.org.uk/software.htm

What a difference a few years make

The picture on the front cover is a composite made from a 1966 advert for the 'Newest High Band Color TV Recorder' from RCA, the TR-70 and the latest (1999) DIGITAL S 4:2:2 editing recorder from JVC, the BR-D85E.

Features of the TR-70 include: -

1. Grouped operating controls.
2. Full instrumentation
3. Standardised modules
4. All front access
5. Front panel test points
6. Eye and ear level monitoring

No other recorder compiles technical specifications and operating conveniences to realise the full potential that high band recording techniques have to offer.

Features of the BR-D85S are: -

1. DIGITAL S record/playback capability
2. 2-channel PCM sound with 16-bit sampling
3. Built-in time code generator/reader
4. Pre-read function
5. Complete analogue interface with input/output connectors

6. Serial digital interface
7. Assemble/insert editing
8. Frame-by-frame recording and editing
9. Jog/search dial
10. Noiseless slow playback facility

As can be seen, in 33 years, the standard of VTRs has improved considerably and their physical size and power requirements have diminished considerably.

Mike Preston made the composite picture, without the aid of a safety net or any assistance from his wife!



Test Card Completed!

I thought this might be of interest and may even jog some memories if the culprit is still around. It's a photograph I took from a monochrome TV screen back in the early 70's. I had to slightly adjust the picture to remove a bad scratch from the left side but the completed row of 'X's is quite genuine. The back-room boys at the BBC completed the game by superimposing the extra characters for a few minutes on Christmas Eve. By chance I had a camera at hand and captured the evidence.

Brian Kelly. GW6BWX

Beyond TTL #15

By Trevor Brown

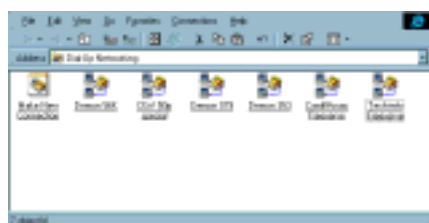
First of all, apologies for explaining something that is only of value to our UK readers, who until now have had to pay a subscription to use the Internet. This has now changed and various free connections are becoming available. FreeServe being one of the first, you will still have to pay telephone charges, but in line with other ISP (Internet Service Providers), they have a line charged at local rates throughout the UK. The down side is if you are overseas this line will cost you an international call, and infrequent users may lose their mailbox.

Local UK call rates are 60p per hour at weekends, 90p after 6pm weekdays (less with some discount schemes). This seems a small price to pay to visit the BATC website. Modems are now down to less than £40 for a 56k and when you add FreeServe contribution of no subscription charges to the equation, well what are you waiting for, if you have Windows 98 or 95 and a browser (Internet Explorer is free and comes included in Windows 98).

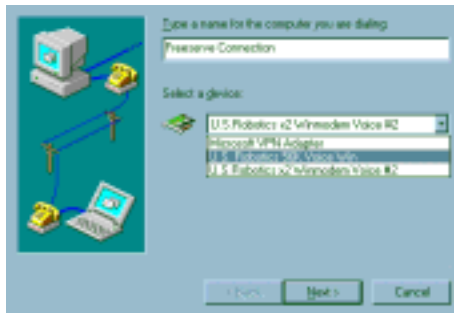
The following instructions were part of J. Aspinal's very helpful website and are reproduced here in abridged form.

1) DUN (dial up networking)

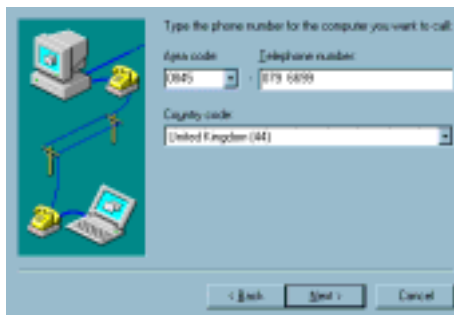
From the start menu, Programme, Accessories select dial up networking. The dialogue box should look like this, although if you have not installed a DUN networking before you will only have the 'Make New Connection'



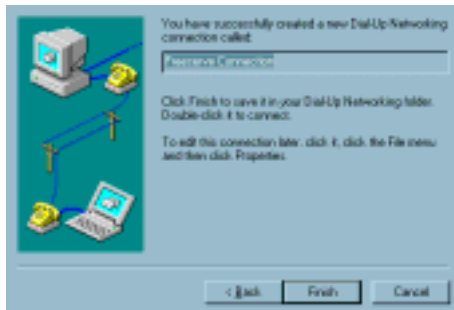
1) Double click, on **make new connection**



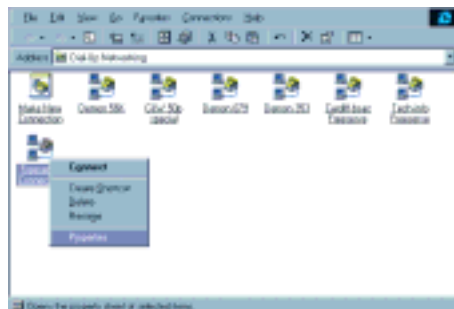
2) Enter "FreeServe Connection" in the top box, select your modem and select next. If you have not installed a modem then you will need to consult your Modem instructions.



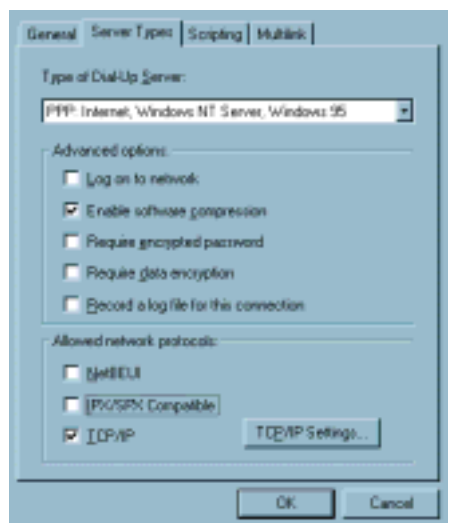
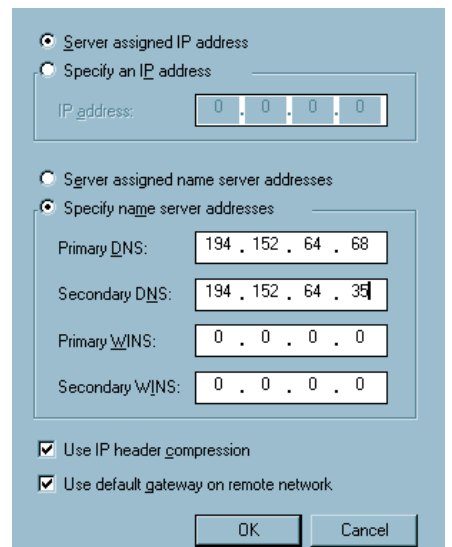
3) Enter the details for this next box as shown and click **next**.



4) This box will confirm that you have created a DUN (Dial Up Networking) click on **finish**.



5) From the DUN window, right click on this new FreeServe connection and select **properties**



Select the server types

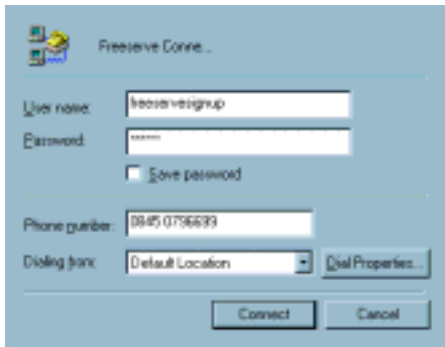
6) Select the server types tab at the top and enable software compression and TCP/IP only now select TCP/IP settings and enter primary and secondary DNS data tick use IP header

compression

Tick **Use default gateway** on remote network and click **OK**.



6) There is no script for FreeServe, and multi linking is not required unless you have two modems, so leave these two tabs alone. Click **OK** to accept changes to FreeServe properties.



7) Within the DUN window double click the **FreeServe** connection

Here use the user name **Freeresignup** and the pass word **signup**

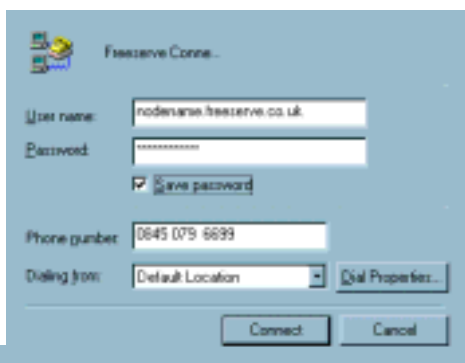
Click on the **connection** button and your computer should dial out to the FreeServe network

Once a connection has been established, launch your Internet browser and go to <https://signup.freereserve.net>

Complete the registration form and select an email address, nodename and password; if your nodename is not unique you will be prompted for another, so think of a few before you start.

Upon completion, the form will ask you to click on a finish button to complete registration. At this point close your browser you do not need the file that would have been down loaded, had you clicked the finish button

Now double click the FreeServe Icon to initiate a connection to the FreeServe service and edit the user name and password to the nodename and password you selected, during registration. If you enable save password, then you will not be prompted for it each time you connect.



Click **connect**, launch your browser and head for www.batc.org.uk - where else.

The next site to visit is www.tech-info.freereserve.co.uk/mail.htm Here you can select the email programme you have eg. Outlook Express (part of Windows 98) or Pegasus etc and you will be guided through how to set up your email, then you can email me at chairman@batc.org.uk

Last month nearly 100,000 people visited our web site where did they come from? Well I will leave you with the following extract, sorted by **requests-**

#reqs %bytes domain

28,677	16.41%	.uk (United Kingdom)
18,366	9.70%	.net (Network)
18,104	16.19%	.com (Commercial, mainly USA)
18,042	13.89%	[unresolved numerical addresses]
5,262	7.44%	.nl (Netherlands)
3,831	3.27%	.fr (France)
3,288	3.10%	.it (Italy)
2,865	3.77%	.au (Australia)
2,381	3.12%	.be (Belgium)
2,284	1.98%	.de (Germany)
1,620	2.01%	.se (Sweden)

1,462	0.34%	.gr (Greece)
1,398	2.02%	.pt (Portugal)
1,329	2.42%	.fi (Finland)
1,269	1.26%	.mil (USA Military)
1,153	1.13%	.es (Spain)
1,026	0.31%	.edu (USA Educational)
966	1.42%	.jp (Japan)
876	0.76%	.pl (Poland)
866	0.78%	.ch (Switzerland)
841	1.05%	.ca (Canada)
648	1.37%	.hu (Hungary)
643	0.53%	.nz (New Zealand)
488	0.66%	.at (Austria)
485	1.11%	.za (South Africa)
481	0.07%	.ie (Ireland)
385	0.45%	.ar (Argentina)
326	0.06%	.no (Norway)
313	0.04%	.org (Non-Profit Making Organisations)
285	0.04%	.my (Malaysia)
274	0.05%	.ae (United Arab Emirates)
245	0.18%	.hr (Croatia)
210	0.03%	.dk (Denmark)
208	0.02%	.sg (Singapore)
178	0.13%	.br (Brazil)
176	0.03%	.cn (China)
174	0.70%	.ru (Russian Federation)
170	0.38%	.om (Oman)
165	0.02%	.th (Thailand)
161	0.03%	.us (United States)
131	0.70%	.arpa (Old style Arpanet)
127	0.02%	.mx (Mexico)
108	0.03%	.ba (Bosnia-Herzegovina)
106	0.02%	.tw (Taiwan)
99	0.03%	.cz (Czech Republic)
99	0.27%	.int (International)
92	0.05%	.kr (South Korea)
81	0.01%	.id (Indonesia)
77	0.20%	.si (Slovenia)
72	0.27%	.ro (Romania)
64	0.02%	.il (Israel)
63	0.01%	.yu (Yugoslavia)
55	0.01%	.tg (Togo)
44		.jo (Jordan)
43	0.02%	.tr (Turkey)
41	0.01%	.hk (Hong Kong)
37		.ee (Estonia)
37		.lb (Lebanon)
33		.bg (Bulgaria)
28		.ge (Georgia)
26	0.02%	.ec (Ecuador)
21	0.01%	.sk (Slovak Republic)
15		.zw (Zimbabwe)
12		.lu (Luxembourg)
11		.gov (USA Government)
9		.cu (Cuba)
1		.is (Iceland)

Post and News

Please send all correspondence for **Post and News** to the CQ-TV Editor. Ian Pawson, 14 Lilac Avenue, Leicester, LE5 1FN, England.

Tel: 0116 276 9425.

E-mail editor@batc.org.uk

Members sales and Trade adverts should be sent to the advertising manager, Chris Smith G1FEF 25 Dando Close, Wollaston, Northants, NN29 7QB. Tel: 01933 666979 Fax: 01933 666972. Email: adman@batc.org.uk



From the Internet

The new 24 GHz ATV distance record is back in Europe due to F5CAU-F6BVA/F6HTJ. See details and pictures on the SWISS ATV web site: www.cmo.ch/swissatv By the way: The historical 430 MHz ATV record of KH6HME-KC6CCC stills unbeaten. See details and pictures on the same site.

73, Michel E. Vonlanthen, HB9AFO

Digital Bits from Ariel

A worse picture with 'digital.

So, finally the BBC admits it, and in *Ariel* no less. The replies to Trevor Bishop make it quite clear -digital TV pictures are worse than analogue.

The digital artefacts need blurring by coding to PAL, says John Kent - if fed RGB to the TV the viewer will spot them.

Well, there's a thing. This wonderful new idea isn't about better pictures or sound, is it? I've been to have a look in my local good TV shop, so I know the truth. The pictures are worse. But they are w-i-d-e and you can have lots of channels, oh yes, and pay per view, and conditional access, and expensive decoders.

I'll stick with the old technology and

pray that my brain never becomes so addled that I think access to dozens of TV channels is a good thing.

Sean Kelly. Kendal Avenue

Put it into soft focus

Let me see if I understood John Kent's advice correctly (letters, January26).

If I'm watching digital TV and get annoyed by the picture breaking up into clunky pixels whenever anything moves, I should use the softer, fuzzier composite input to blur the effect.

If you're unsure of how to do that here are my top tips: smear the screen with a nice thick layer of Vaseline to hide those pesky pixels. (Those unfortunate enough to have high grade monitors may need to glue tissue paper over the screen to fully improve their 'viewing experience'.)

Alternatively, consider the download from your rooftop aerial. (Remember that? It's been up there for donkey's years and is probably full of rainwater.) Spend a few quid getting it replaced and enjoy crystal clear analogue pictures for the next decade at least.


Martin Young, Outside Broadcasts

From the BBC Staff Newspaper 'Ariel' 2/2/99



ATV in Slovenia


Just like to inform you that you can access our 30Mb large site on: <http://lea.hamradio.si/~s51kq> With best regards Mijo K. S51KQ S5 ATV & RPT Manager




There is a new update of the Radio and Television Transmitter Site.... Check it out and give a opinion....??? in the Netherlands
<http://www.cybercomm.nl/~hpl/index.h>



[tm](http://www.fortunecity.com/tattooine/tolkien/272/index.htm) and into the UK
<http://www.fortunecity.com/tattooine/tolkien/272/index.htm>



"I have put together a small web site discussing ONdigital and DTT stuff. I wanted to share my ONdigital experience but did not want to bore you all with a long ranting e-mail, so if you're interested please check out <http://www.jaura.freeseerve.co.uk>. Any feedback would be gratefully received, as would any suggestions for additions or improvements. Thanks, Yad Jaura"



A group of collector-historians has recently formed the "Tube Collectors Association." This is in response to the need for a focused group dedicated to the growing activity of collecting radio/wireless tubes and to sharing historical insight about them. As a tube enthusiast, you'll probably be interested in this development, and may want to help guide the activities of the group from the start. For more information and an application go to: <http://www.eht.com/oldradio/tubecollectors/index.html>

Contributions

If you have any snippets of news or information, then please send them in to my the editor either by snail mail or email

Non trade advertisements are placed in this column free of charge to paid up members only. Please quote your membership number. Copy should be sent to:-

Chris Smith (G1FEF) 25 Dando Close, Wollaston, Northants, NN29 7QB

e-mail: adman@batc.org.uk

Members adverts

Free

FREE TO GOOD HOME: Heavy box containing almost complete set of CQ-TV from issue no. 70 through to last summer (from silent key). Some scribbling on covers but fine as reading

copies. Must be collected from Northampton or from rally. **Contact Andy Emmerson G8PTH, tel: 01604-844130.**

For Sale

Amstrad SRX200 with remote control, free to a good home in return for postage. Also a standalone Videocrypt decoder for 10 GBP plus p&p. **Contact Mike Hogg, 30 Buckstone Howe, Edinburgh, EH10 6XF Email: mike@moonbase.demon.co.uk**

CCU, Lens, Viewfinder, will need a bit of mechanical work to wedge plate mounting arrangement otherwise good condition.

1480, Barco CM33, Schinder lens TV39.2 and others, Pye LDM1911/1915 monitor, Ikegami TM10-16R.

I am Happy to consider swaps for any of the above as I am keen to expand my technical reference library.

If any of the items take your fancy give me a ring. I would point out I am not into parcels or interesting conversations with "Bloggs Parcels etc." so except for that which will go into the post box it's collect only.

B. Summers G8GQS not QTHR 01276 677879 0797 0417875 Camberley Surrey, England

Quantel DLS 6001 Digital Library system. comprising :- Electronics crate with grab input and three separate picture outputs, disk drive unit, removable disk drive unit, control panel, keyboard. This unit is ex BBC news and formed part of their picture slide store. Circa mid 80's BIG! Not for faint hearted. £75.00

Sony VO-4800 portable U-matic video recorder, battery, AC power supply leatherette case and box of 10 tapes. Believed to be in good working order, £65.00

Panasonic wide carriage dot matrix printer KX-P1540 with serial and parallel interface Cox control panel for editing 220 mixer in nice sloping case £20

Cox extender boards, a selection available, also other extenders enq. please.

Handbooks for TEK. 465B, 528A,

Link 125 Studio broadcast camera,

Wanted

I have a Spectrum Analyser 'System Donner Type 51', PN 37000-040M SN 210-170, and although I have managed to get hold of an instruction Manual, there are no circuits in it. Can anybody please put me in touch with a copy of the Service Manual complete with the circuit diagrams? **Contact Rene Volland, F6BRV, ANTA, 1 Rue de Boulogne, 37000, TOURS, France.**

Info needed on Systron Donner model 1720 microwave synthesiser. Service handbook and or info relating to Error No12 and Error No 14. **Contact Joe Bell 01270 763504**

WANTED but not for me this time! A friend has just acquired a Shibaden FP-100 camera (small studio b/w viewfinder camera, circa 1970, using 1" vidicon tube). I said I'd try and help him find the missing bits that he needs,

namely pull-handle zoom lens, matching Shibaden sync pulse generator (small boxy thing, someone was selling this at the BATC rally last year!) and matching Shibaden HV-15S caption camera (like a Japanese version

of the Pye Lynx but better made and with a 6-pin Cannon connector on the back for external drives. *Contact Andy Emmerson 01604-844130 or midshires@cix.co.uk*



Visit our Web site at www.batc.org.uk to view or download electronic versions of recent issues of CQ-TV

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