

CQ-TV



No. 171

August 1995

BEYOND TTL

TRANSMITTING LNB's

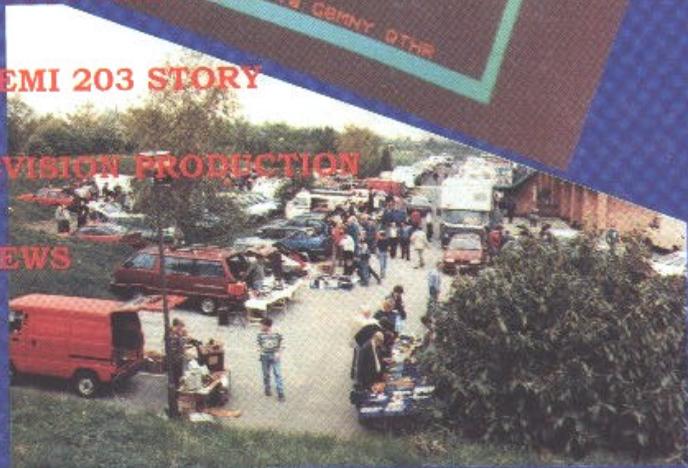
GB3HV TELETEXT SERVICE

ATV REPEATER UPDATE

THE EMI 203 STORY

TELEVISION PRODUCTION

REVIEWS



BRITISH AMATEUR TELEVISION CLUB



CONTENTS

2	Who to write to	
4	Post and News	
6	Editorial	
7	Rally '95 Report	Mike Wooding G6IQM
10	Circuit Notebook No. 55	John Lawrence GW3JGA
13	Beyond TTL	Trevor Brown G8CJS
17	Television Production for the BATC	Norman Ash
22	Update on 23cms ATV repeaters	Graham Shirville G3VZV
23	Repeater Updates and Developments	Graham Hankins G8EMX
24	GB3HV Teletext Service	John Stockley G8MNY
28	The Green Machine	Dicky Howett
35	Forthcoming Attractions	
36	TV On The Air	Andrew Emmerson G8PTH

SUPP 1 - SUPP 8

BATC MEMBERS SERVICES SUPPLEMENT

41	Satellite TV News	Paul Holland G3TZO
55	Transmitting LNB's	Peter Johnson G4LXC
74	Market Place	

CLOSE FOR PRESS FOR THE NEXT ISSUE20th September 1995

CQ-TV is produced on a 486 PC computer system, using the Word for Windows word processing package. The camera ready artwork is produced on an Epson EPL5200 laser printer.

Printed by *Cramphorn Printers Ltd*, 15c Paynes Lane, Rugby

WHO TO WRITE TO

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

BATC Chairman Trevor Brown G8CJS

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

BATC General Secretary Paul Marshall G8MJW

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

BATC Hon. Treasurer Brian Summers G8CQS

Enquiries regarding club finances, Donations, and constitutional enquiries. 11 Harefield rd, Uxbridge, Middx, UB8 1PH. Tel: 01895 810144, Mobile 0850 014892

CQ-TV Magazine Editor Chris Smith G1FEF

Anything for publication in CQ-TV, Articles, Review items, Advertisements, Letters to the editor, and other material except as below. 19 Ravendale road, Gainsborough, Lincs, DN21 1XD. Tel/Fax: 01427 614788, Mobile 0589 631104

TV ON THE AIR:- Andy Emmerson G8PTH, 71 Falcutt way, Northampton, NN2 8PH. Tel: 01604 844130

SATELLITE TV NEWS:- Paul Holland G3TZO, Chatterton, Chapel Lane, Threapwood, Nr. Malpas, Cheshire, SY14 7AX. Tel: 01948 81429

CQ-TV AWARDS:- Bob Webb G8VBA, 78 Station road, Rolleston on Dove, Burton on Trent, Stall's., DE13 9AB. Tel: 01283 814582

EXHIBITIONS

Rally 96:- Mike Wooding G6IQM, 5 Ware Orchard, Barby, Nr. Rugby, CV33 8UF.
Tel: 01788 890365, Fax: 01788 891883, Mobile: 0860 857434

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

CLUB SALES

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

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

MEMBERSHIP

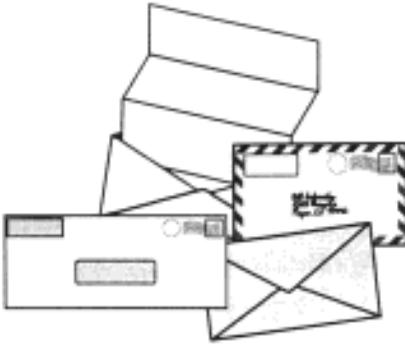
Anything to do with membership, including new applications, queries about new and existing
membership, non-receipt of CQ-TV, subscriptions, membership records, data protection act.
Dave Lawton G0ANO, 'Grenehurst', Pinewood road, High Wycombe, Bucks., HP12 4DD.
Tel: 01494 528899

CLUB LIAISON:- And anything of a political nature, co-ordination of ATV repeater licences.
Graham Shirville G3VZV, The Hill Farm, Potsgrove, Milton Keynes, Bucks., MK17 9HF.
Tel: 01525 290343

CONTESTS:- Richard Guttridge G4YTV, Ivy House, Rise Road, Skirlaugh, Hull, HU11
5BH. Tel: 01964 562498

BATC BBS SYSOP:- Brian Kelly GW6BWX, 12 Cotswold Way, Risca, Gwent, NP1 6QT.
Tel: 01633 614376, BBS: 01633 614765

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



STOP PRESS!!!

Here's some real ATV news

On the 18th & 19th of August 1995, Bob Platts G8OZP will attempt a two way 3cms contact across the North sea with Hans Dekker PE1ECO.

Bob will be setting up outside the Brudenell Hotel, on the seafront at Aldeburgh, on the Norfolk coast. His equipment will consist of a one metre dish, a 1.2db LNB for receive and either his synthesised transmitter or a DRO stabilised transmitter (whichever works on the day!). Bob hopes to output between 0.5 and 1 Watt.

Hans Dekker PE1ECO will be at the other end, in Holland, also at sea level. So they are hoping for some nice weather to allow ducting, as the sites are not line of site (a lot of water in the way!).

Anyone with the appropriate equipment is invited along to have a go, anyone without appropriate equipment is invited along for moral support, or just to sight see. The fun starts at around 10:30.

Good luck Bob & let me know how it went for the next issue.

Dear Chris,

The November 19th 1994 Swiss ATV meeting in Ecublens, Switzerland was a great success with a lot of visitors. ATV'ers or not (not yet ...). This has encouraged the organisers to continue in establishing the base of a new ATV association in Switzerland after the 'death' of the ancient USAT. This is now done and to establish clearly that the association respect all the four languages used in Switzerland (German, French, Italian and Romanche), the chosen name is **SWISS ATV**.

The founding meeting clearly established the essential goals: Firstly to maintain and de-velop contact between all ATV'ers (with QSO's, meetings, packet radio QSO's, newsletters,

and so on ...)and second to be representative of the interest of the ATV movement for the Swiss ham and non-ham authorities. All of this with a minimum of administration (Consequently the annual fee is very low: 15 FrS). The first committee is composed of the president Michel Vonlanthen HB9AFO, the secretary Arnold Pasche HB9STX and the cashier Dr. Angel Vilaseca HB9SLV.

It is to be noted that because of the four languages used the SWISS ATV expect to drain papers and lectures from all over Europe. Before each meeting, a call for publications will be done and all lectures will be given in their original languages, if possible with some sort of translation. For this reason, the executive committee will try to synchronise the Swiss meetings with all other European meetings to avoid having two the same day. The SWISS ATV executive committee hopes strongly to develop the international collaboration between all national ATV organisations in order to increase the ATV activities and to be a real influence in administration decisions regarding our part of the ham radio hobby. So, the membership is not only reserved to the Swiss citizen but to all ATV good-willing hams.

To finalise: In your annual planning, don't hesitate to incorporate the SWISS ATV meeting dates. You will always find there friends speaking the same language as you and having the same passion. Additionally, you will be assured in the SWISS ATV meetings to eat good (nobody knows, but sometimes we give kitchen receipts by ATV). And last, but not least, remember to turn your antennas to Switzerland during contests or openings. There is some activity there!

Michel Vonlanthen HB9AFO

PLEASE SEND ALL CORRESPONDENCE FOR POST & NEWS TO:

**CQ-TV
Chris Smith G1FEF
19 Ravendale Road,
Gainsborough,
Lincolnshire,
DN21 1XD**

**Tel/Fax: 01427 614788
Mobile: 0589 631104**

E-Mail:

Chris@batc.demon.co.uk

EDITORIAL

Hello again and welcome to another edition of CQ-TV, this is my third outing as editor of your magazine and I hope I'm proving to be a worthy replacement for Mike (fishing for compliments there!). I haven't received too many letters this time, perhaps you've all been too busy rallying and soaking up the sunshine? Talking about rallies, Mike has been kind enough to provide us with a synopsis of THE rally earlier this year, I hope all of you that attended enjoyed the event, and all that didn't attend will do so next year!

I certainly enjoyed the day, only the number of volunteer helpers appears to be decreasing every year. Please don't wait to be asked, if you can spare ten minutes - put yourself forward and volunteer!

Still on the subject of rallies, did anyone take any photo's at our rally? I thought Mike would be doing his usual snapping, he obviously thought I would be, and between the pair of us, we got a big fat nothing! If anyone has any piccy's please send 'em in.

You may notice that the magazine has a different 'feel' to it this issue, the reason being that I have moved over to 'Word for Windows 6' entirely. Up until now I had been pre-processing material in Word, then used Pressworks to frame the pages and do the printing. Mainly because a lot of the artwork was still in Pressworks and I have only now managed to prepare everything on Word. It makes my life a lot easier, as I use Word myself every day at work and at home. If anyone has any comments on the new look and feel, please let me know (not that I'd do anything about it, but it's nice to know what you all think!).

Finally, just to prove all you cynics wrong, I'm STILL at the same address! Yes folks I CAN stay in one place longer than six months, in fact I quite like the house I'm in now and may well stay here for at LEAST another six months! So no excuses about not being able to keep track of my address (as somebody commented), keep your letters and articles coming.....

Chris Smith G1FEF
19 Ravendale Road,
Gainsborough,
Lincolnshire,
DN21 1XD

Tel/Fax: 01427 614788

Internet: [Chris@ batc.demon.co.uk](mailto:Chris@batc.demon.co.uk)

RALLY '95 SHOW REPORT

By Mike Wooding G6IQM

Its now several weeks. since the rally and I thought it about time I sat down and wrote a report of the event.

Saturday April 29th 1130: I headed for the Sports Connexion loaded up with all the paraphernalia for the rally and, of course, all the VHF Communications rally stock. We were again fortunate enough to have full access to the hall at the Sports Connexion from early Saturday afternoon, which made for a more leisurely (I use that word perhaps a little out of context!) set up. During the afternoon and early evening, with the grateful help of Des G3NNG, his wife and Dave (another member whose call sign I can never remember - apologies) the 200 or so tables were set out in the hall. Not a task to be taken lightly with only three of you carting tables about! Perhaps one or two others may help next year?

Having set out all the tables and my own stand I started to twitch a little when by 1830 our esteemed editor Chris had not yet arrived. The problem was that at 1915 prompt I was expected at the Bull and Butcher by my family for an evening meal. etc., and Chris had again undertaken to cable the various stands up for electricity and he had all the cabling! I was about to go into a mild apoplectic fit when at around 1900 Chris, Charmaine and the Smith entourage arrived. A hurried planning meeting was convened, Chris was given the electricity layout plans and I beat a hasty retreat to the showers to get changed etc. I left for the pub at 1920, almost on time' - and Chris running cables around the hall with frenetic enthusiasm!!!

We were almost ready.

Sunday April 30th 0615: The day dawned (literally!) I set out again for the Sports Connexion. 0700 the site is opened up to the traders, some of who were waiting for me when I arrived, and the whole thing slowly geared up into motion. By this time of course the rally had developed a mind of its own, and essentially was on an unstopable course, only slightly modifiable by me or anyone.

Chris had done a magnificent job with the electricity cabling, but we were having one or two problems with certain feeds not becoming live, a problem with the supplies in the hall. A few swift cable reruns and all was OK. Mind you, running cables around traders setting up stands can be a little problematical, so I would like to say here and now many thanks Chris for your stalwart efforts - we can do it all again next year! And by the way Chris, not a bad shot EH? - but you should see my ball of string now!

Outside in the car park the boot fair traders were setting up, and by 0800 doing a brisk trade. If you arrived later than 0900 then you probably missed all the best bargains! Brian Kelly, a fellow committee member, arrived and took charge of attempting to apply a modicum of order to the boot fair proceedings, not without a little success I must say. The whole thing was far better controlled this year - thanks Brian.

Alan Watson and his team arrived around 0900 and started to set up the PA system. It has been said by many people at our rallies throughout the years, that we have the best PA system that has ever been heard. You can certainly do that - Hear Us!!! Alan is professionally involved with PA work and knows what he is about. Thanks Alan -same time, same place next year please.

OK, 0945 arrived, the trade access doors were closed and we prepared to let the vast waiting crowds in (well the patient few anyway). 1000 and the doors were opened and a brisk trade in stamping peoples hands was started (sorry about that if you disapproved - but I bet it took some of you back to mis-spent youths in Locarno dance halls?). A steady flow of visitors coming in was maintained during the next 2 to 3 hours and good trade was enjoyed by many of the traders. The weather once again was excellent,, allowing the outside traders to also have a good day. And the overflow car park did not turn into an off-the-road mud bath!

1700, the rally was officially closed to the public and by 1800 we were stacking tables and Chris was collecting all his mains cables. 1930 and the site was vacated by the BATC. I went home , had a hasty meal and at 2030 was heading down to Basingstoke for the start of a 2 week training course! At least it would keep me away from the phone and all the complaints I thought - as it turned out we only had two, and they both had my mobile number!

Anyway, for my part the rally was a great success, both organisationally and from a visitor/trader point of view. We had something of the order of 950 visitors, which is somewhat down of earlier years, but slightly more than 1994. A general trend in rallies other than the 'big' ones. I was gratified to receive the many comments concerning the type and quality of traders attending the rally. One reason for only using the one hall was to reduce the number of non-radio traders as much as was financially possible (another reason was saving £1200 on the hire fee for the venue!). Yes, of course there were a lot of computer and non-radio traders present, this is a must to make the show profitable (our worthy Hon.Treasurer does not like me to make a loss!). Also, many of our members and visitors to the show are also interested in the computing side of the hobby, and there just are not enough radio-related traders left in business any longer, let alone TV related ones!

So, before anyone out there starts throwing stones at me - I do not apologise if the balance between the types of traders was still wrong in your eyes - for many people the rally was right, and I think so too. What's more we made a tidy profit this year, almost into four figures (and that does not include the amount to the right of the decimal point!).

I would like to thanks all (?) who helped with the setting up and breaking down of the rally (perhaps a few more helpers on the Saturday next year please), with the committee for the full support it has given me again and most of all for you for supporting your Club.

See you next year, 73) ... Mike G6IQM

RALLY ' 96
SUNDAY APRIL 28TH
SPORTS CONNEXION
COVENTRY

CIRCUIT NOTEBOOK No. 55

By John Lawrence GW3JGA

Control by DTMF (Dual Tone Multi Frequency)

As most of you will know, DTMF signalling is the method used in the latest telephones and car phones to send push button dialling information to the exchange, also telephone answering machines may be controlled by using a DTMF tone dialler held to the telephone handset. DTMF is also the signalling method used over the air to control Amateur Radio Repeaters.

At the sending end 8 individual audio frequencies are used. These are divided into two groups of four and at each key press two tones, one high and one low, are transmitted simultaneously. The four high and four low tones form a matrix which provides 16 possible tone combinations.

To decode the signal a DTMF decoder chip may be used, the Industry Standard is the 8870 or in its plastic DIL form it is the MT8870DE. It accepts the audio signal input and filters the higher four frequencies from the lower four. Each frequency is then detected digitally and the resultant key press information appears at the output as 4-bit parallel data. The decode Table is shown in Fig. 1. This data may then be decoded further to 16 individual lines, each corresponding to the original key press.

The individual lines (at TTL level) can control circuits directly or can turn a logic circuit 'on' or turn it 'off', operate a relay, control equipment, send a series of characters - the possibilities are extensive. So what has this got to do with ATV you may ask.

Take a 10 key DTMF tone dialler (e.g. Maplin ZB19V @ £5.94) and turn it on its side so that you have 3 horizontal rows of 4 keys, then this could represent the panel of a 4 input A-B Mixer, A on the top row, B on the middle row and preview keys on the bottom row. Here then is the basis of a vision mixer keyboard for just a few pounds. All you need to do is to take the fully decoded outputs from a MT8870DE - 4514 combination, as shown in Fig.2, and use them to control video switches as shown in Circuit Notebook No.54. If you relinquish the No.4. preview key and called this FADE, then by using the auto-fade circuit, also from Circuit Notebook No.54, you would have the equivalent of a 4 input video mixer in the palm of your hand.

You would be able to cut between any of 4 video inputs, you could key one input on line A and another on line B and then by keying FADE, A would fade to black, switch to B and then B would fade up. You could preview inputs 1 to 3 (not 4 as this key is FADE). Not only would you have a miniature mixer, but this could be operated remotely over any channel or link capable of carrying audio frequencies.

As regular readers of Circuit Notebook will know, the intention is to pass on various bits of circuits and ideas to encourage experimentation. However, the interlinking circuits required will be given in a future edition of Circuit Notebook.

F _{LOW}	F _{HIGH}	NO.	O4	O3	O2	O1
697	1209	1	0	0	0	1
697	1336	2	0	0	1	0
697	1477	3	0	0	1	1
770	1209	4	0	1	0	0
770	1336	5	0	1	0	1
770	1477	6	0	1	1	0
852	1209	7	0	1	1	1
852	1336	8	1	0	0	0
852	1477	9	1	0	0	1
941	1336	0	1	0	1	0
941	1209	*	1	0	1	1
941	1477	#	1	1	0	0
697	1633	A	1	1	0	1
770	1633	B	1	1	1	0
852	1633	C	1	1	1	1
941	1633	D	0	0	0	0

Fig. 1

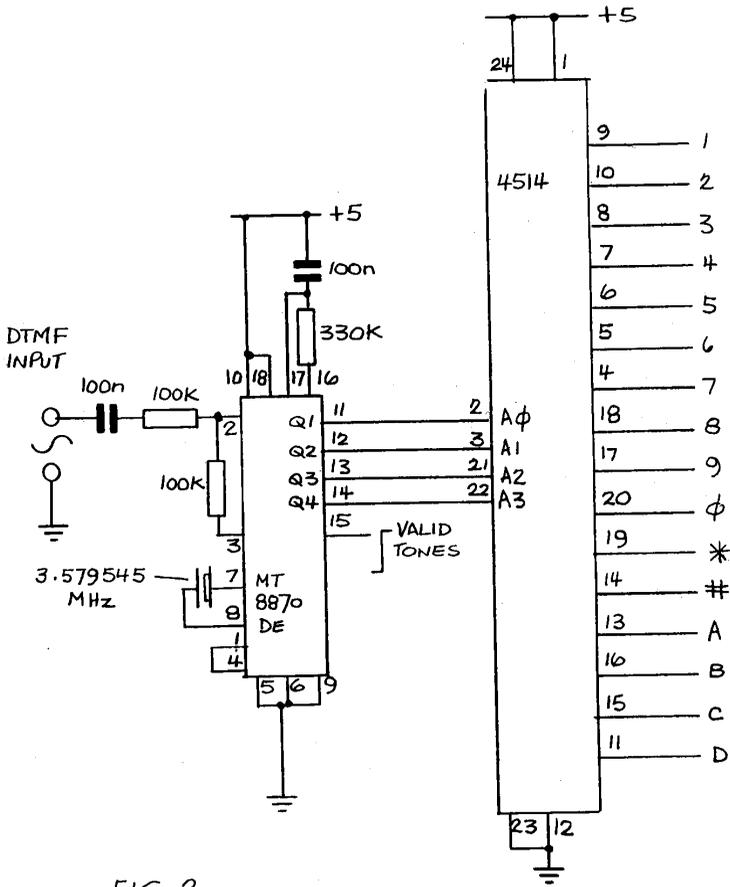


FIG. 2.

BEYOND TTL #9

By Trevor Brown G8CJS

This time I want to leave the subject of Basic and the world of PC's and return to Z80 hardware and machine code programming. The subject is not Television but Snooker. I make no excuses for using a non,ATV subject, this column is about mastering micro electronics, you can apply the techniques to A TV later.

There is also tenuous link between TV and Snooker, well Michael Grade seemed to think so. This project was originally engineered around A level students so they could build something that would enable them to get their feet wet in programming, hence the non ATV subject, I felt snooker would provide a higher level of interest and better motivation. The project also appeared in Everyday Electronics and I would like to thank the editor for permission to reproduce it here. The project is in two parts, hardware and software. I am going to cover the hardware this issue and the software next issue. For the really enthusiastic among you a PCB was at one time available, and may still be available from Magenta Electronics (See Ads in Everyday Electronics). By not reproducing the software until the next issue it will give you a chance to try writing your own code. To this end I thought I would throw down the gauntlet and instigate the beyond TTL competition for the best EPROM sent to me before the closing date of CQ-TV 172 . The winner will receive a free ATV handbook. (second prize two ATV handbooks). All the necessary information has been covered in this series from Z80 instruction sets to memory maps and 8255 instructions. This is your chance to see if you can put it all together for yourself. If you are missing any of the information , back photocopies are still available so no excuses. If you are really desperate to build the project before the next issue and are quite sure the software is BEYOND YOU try crossing my palm with silver I still have one or two pre programmed EPROM's on my desk.

The snooker scoreboard uses an array of LED's to replace the traditional wooden board and sliding pointers. The LED's are arranged to look as much like the traditional score board as possible. The score is entered by a set of push buttons corresponding to the different coloured balls. The single display is switched between the two players scores, and the score is always added to the selected player. At the end of the game the reset button is pushed and the score board resets ready for the next game.

The LED'S are laid out in just the same way that the traditional wood pointers were. The first 19 LED's represent the score 1 to 19 and only one of these LED's is illuminated at once. The next LED has the value 20, and then 40, and then 60 incrementing up to 140 and only one of these LED's is illuminated at once so the score is the addition of the two LED's (159 Maximum). This display was chosen so as to be as near to the old wooden sliding pointers as possible and thus make the older snooker buffs as happy as possible with this hi tech unit. The LED's were 3mm or 5mm if you want to enlarge on this and fit brighter displays then it would be a good idea to fit standard TTL rather than LS chips in place of IC4 IC5 and IC6 The display shows only one player's score at once with a switch to alternate the display between players.

This system was chosen to keep the cost of the display down. The operational controls are, one switch to select which player's score to display, and a set of push buttons to update the selected score. The push buttons are colour coded to match the balls so all that is required is to select the player and press the colour button that corresponds to which ball he has pocketed. All the push buttons are the normally open kind and are non latching with the exception of the player 1 player 2 switch which is a push on push off type or could even be a simple toggle switch.

When the score board is first switched on and the reset pressed, all the LED's are tested in a rather eye catching display, then all the LED's are extinguished, if the red push button is pressed then the first LED lights (score 1) if the yellow button is then pressed the LED 1 is extinguished and LED 3 is illuminated (2+1). If green is now pressed then LED 3 is extinguished and LED 6 is illuminated (1+2+3). If the player switch is then thrown the display will be extinguished. If the red push button is pressed the LED 1 will be illuminated. If we switch back to the other player the display will revert to 6, his remembered score.

Should the cue ball be pocketed inadvertently then switch to your opponent and advance his score by 4 by pressing the brown/white button. When a score is entered then this is acknowledged by a bleep to give confidence that the key press has been accepted, at least that's what my EPROM is programmed to do yours may be different.

Fig 1 shows the circuit diagram of this unit. The basis is a Z80 micro processor that runs a programme stored in the 2764 EPROM. The xtal.controlled clock is made from 3 hex invert gates (74LS04). The xtal is not critical and can be between 1 and 4 MHz, the only thing that will be affected is the speed of the lamp test display and pitch of the keyboard sounder. The 8255 that provides 24 Input/output lines for the computer. Eight of them are used to input information from the seven non locking score buttons and the eighth toggle switch or latching push button, that is the player

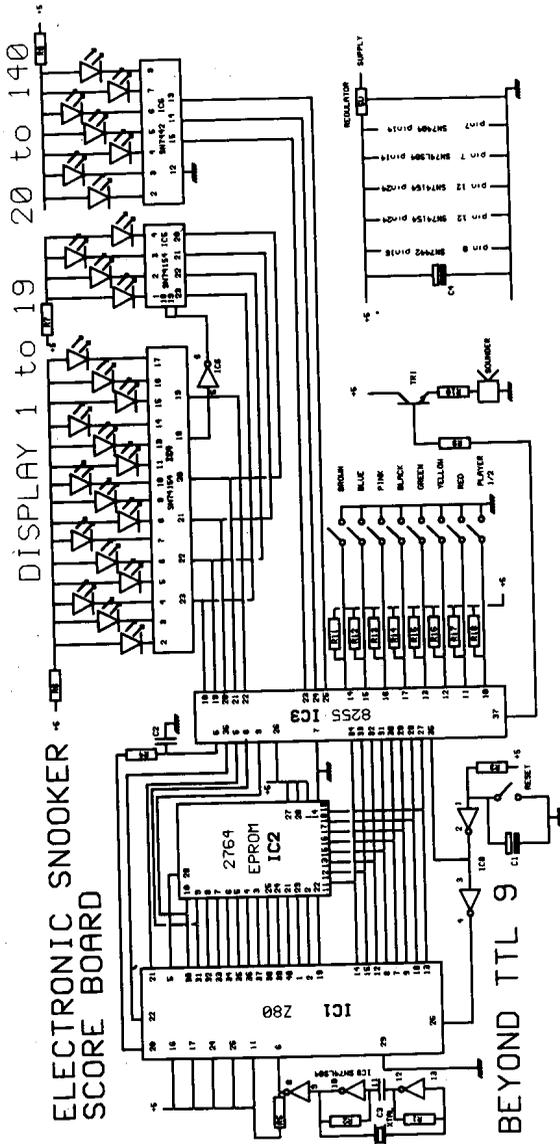
one/two selector. Eight lines are used to carry the score information to the LED's. This information is coded so as to drive 26 LED's. The coded score information is decoded by the 2 74LS154's and the 74LS442. One I/O line is used to drive the low impedance sounder via a buffer transistor. The resistor in series with the small sounder can have its value increased should the bleep be too loud. The reset push button is of the push to make type along with the score buttons and should be non latching. The prototype was built using vero board and wire wrap, but a single sided PCB has now been designed and is available from Magenta electronics or I have a gel you can borrow if you want to try home etching.

The LED'S are mounted in a single row along one edge of the board, care must be taken to get them the correct way round. The display can be improved by using coloured LED's for the 20, 40, 60. section. The Push buttons are the normally open kind and are connected to the board via flying leads. The connection pads are located at the side of IC3 and are identified with the colour of the push button the other connection is to the pad marked X which is located at the other side of the pull up resistor, remember that the push buttons are all non locking with the exception of the Player 1 Player 2 switch which is a latching switch or push button.

The pad for this switch is labelled PL. No pads have been provided for the reset push button on this inexpensive PCB, instead it is wired on to the ends of C1. The sounder is a simple earpiece or small moving coil loudspeaker.

The EPROM is located at memory location 0000 and the 8255 is in the I/O map as per previous examples in this column. A small delay routine is required at the head of the software in order to allow the 8255 to recover from reset and receive instructions. 50u sec's is enough. I am not going to give you any further help until the software listing is covered next time.

The 2764 EPROM can be programmed on either the Spectrum EPROM programmer or the more recent PC EPROM programmer. So its time to hit the keyboard and enter the great BEYOND TTL competition and see if you can win the coveted ATV Handbook. The Judges decision (mine) is final and no correspondence (above the usual two sacks a day that I currently receive) will be entered into.



Television Production for BATC

By Norman Ash G7ASH

The committee has agreed the go ahead for me to co-ordinate and develop 'Television Production' aspects within BATC. This is an outline of 'ideas'.

Members are asked to send me their comments and own ideas. I would like very much, to be able to keep the committee informed, regarding members feelings, activities and developments in 'Television Production' and naturally, the Committee can only act upon these if you keep it informed.

'Co-ordinating' will only work if I have something to co-ordinate and I want to carry as many members with us in the clubs TV Production involvement as I can. Most of all **BATC** needs **constructive** contributions - please criticise - but back up your point of view with your **constructive** alternative(s). You now have someone who has been prepared to push to get things done in this area and this door is 'open' to us!

My personal attitude is that there is much scope for **BATC** to encompass a very wide range of activities and interests, which can be developed and supported without intruding on other aspects of the club. Indeed there is a natural progression between the many members actively interested and involved in the technical side and those with an interest in using these developments; I would go further and say that seeing the technology being used in a very practical context is likely to stimulate much interest on the technological development side. These aspects are complementary.

Building BATC up to meet the future for **ATV**, means having the proactive support of its members through constructive contributions (we all need to avoid confliction within the club, whilst we all look to ensuring its future). Between the few members that actively do a lot for the club and those who are simply passive members, are those who would, or do take an interest in one aspect or another, but who may (for whatever reason) have decided that they cannot actively participate, so far as **BATC** is concerned.

Establishing a Television Production 'interest section' (where members register their interest in this aspect), might be a good approach? Then even where you view it that you cannot get involved to any substantial amount, you may be able to participate at a level where you get more out of it and feel more involved with what we do; part of this aspect is you 'having a say', which contributes to **BATC** finding the right way forward to an appropriate future.

I am interested to hear from anyone who would like to be involved on an occasional basis, in any area of TV Production; if you would be interested in 'helping out' in your local area, or taking part in the managing and organisation side - feel free to contact me without feeling 'obligated' to do more than you feel you want. Every small contribution adds up to supporting **BATC** in developing and maintaining ATV, which in turn can only benefit the enjoyment you get from your Hobby and a hobby is there to be enjoyed - there is no point in anyone becoming involved if they don't get enjoyment from the return they get from participating.

I have opened up the opportunity for our membership to have a real say in the future of Television Production within the club, what follows in this article are some details to help you respond with feedback to me. Whatever this response is, I shall then report it to the committee. The next stage will depend very much on your reactions, taking this into account, if there is not enough active support to 'get us going', I will be looking at recruiting and establishing a wider membership who wish to become involved in TV Production.

Details I have put forward the following aims for the Television Production section.

- to stimulate operational activity within ATV
- to provide basic operational training for ATV enthusiasts
- to draw young people into the hobby by such activities
- to develop & establish techniques - and standards of working
- to use production activity as a vehicle for beneficial ATV publicity

So what should we be doing? What could we be doing? Here's *your* chance to let me know what you think!

One of the first tasks is going to be to make an 'up-to-date' video about us! I welcome ideas for inclusion and am particularly interested in any Broadcast Quality footage of 'Fine Business' BATC members operating etc. (details only at this stage please!).

I would like to start compiling a list of members who would be willing to get involved with our production work. If you are interested - generally, or in a particular aspect of television production please let me know.

In my experience of running a College of Further Education's Television Studio, I am very aware that there is a sizeable minority of young people wanting to get into 'Television' as a career. There is also many who wish to progress with Media Studies. The practical experience we could offer such people would stand them in good stead with the competition, with the proven practical ability and the demonstration that they *can* 'get up and do'. I would ask all members to be aware of this (or even actively seek out if appropriate!) so that you can refer interested young people to us. Subject to committee approval, I hope to produce some simple 'handouts' for this purpose.

We have agreed that we are talking of Broadcast Quality 'Mastering' for major production projects, so I hope this will set a benchmark for us to progress with.

I see a number of operational aspects involved. Multi-camera Studio Based, Multicamera mobile and Single camera mobile. Working together we should be able to obtain much of what we need. Please let me know if you, or someone you know, is willing to support us with facilities from time to time. Don't forget that we may need some of those extra items, like cables, lighting, transport & generators occasionally. Knowing you would contribute certain items will greatly assist us and may make the difference between a viable project and one we cannot afford to do properly!

Some BATC production projects I am thinking of putting forward are video's on..

- **Television Production Techniques**
- **Television Technical Techniques** (of which I expect a mass of member contributors, if it gets approval!)
- **Television Transmitting Techniques** (of which I expect a mass of member contributors, if it gets approval!)
- **Television Devices** (what they do /how they work) (ditto above!)
- **Top Amateur Television** (about what the top ATV enthusiasts are doing/have done throughout the world)

I am very keen on us producing our own video version of the 'RSGB News Broadcast' and was pleased to hear support for this at the Convention last September. I am personally in favour of linking TV repeaters for this - providing we don't put anyone's nose out of joint over it (and obviously get RA permission with BATC approval). So those of you who are keen please contact me, as I can now put things forward to the committee.

In the mean time if local groups could start to think about the possibility of a future weekly contribution to an 'ATV News' Broadcast.. I think a UK ATV video network' would be very exciting if we can do it. Who knows it may spread to Europe and the world after that!

I think that live action video has an advantage over various other data communications methods, in that it is possibly the most attractive media for a 'viewer'. In particular ATV can convey the personal qualities in a way that many forms of data communications cannot. Even in radio terms, it is not possible to see the delight on an operators face when you report a good DX (P5) signal!

I am aware that we are not just about transmitting pictures and it is not just because I am licensed that I am plugging this aspect: You will know how much our 'wide band' access is under threat and one small thing we can do to demonstrate its worth to us, is to use it as fully as we can.

Personally, I take the view that just because I am not transmitting, I do not 'need' the frequency allocation is wrong - this is a rapid conclusion that even ourselves jump to, so you can imagine how it would go down with any Whitehall bureaucrats who aren't familiar with technology! Our licences are for **reception** as well as transmit! We all need to remind everyone of this fact! I have a strong suspicion that a good number of members are tuned into beacons and repeaters "for self training in communication by wireless telegraphy (including investigations)". Then once the new device is aligned we need the allocated wide band to work it on. The fact that we are not all operating day & night is a different issue. When we are we get complaints - you can't win!

I got a feeling of some despondency (in high places!) that we are following the 'state of art' rather than leading it. Maybe this is because of the fact that the present technology is moving so fast, but it is also exciting for us. What we are good at, is rethinking and applying technology to other uses not even contemplated by the original designer, putting things together, which others have never thought about putting together! This is the other side of the coin. We have so much technological development occurring now we should be overwhelmed by possibilities for future ATV.

The future for 'live action video' is not going to change - the 'possibilities' are though! The Technology is. People will still prefer to watch this than other alternative methods of communication. What is here now, is the merger between Television Technology and Computer Technology - soon there will be no difference! We have much we can do as amateurs in this new field. Television Production in the conventional sense will *devolve* into Multimedia Technology. Soon it will all be recorded onto cheap and massive blocks of digital memory. We will be investigating the combining of data transmissions with live action pictures and sound (maybe on several simultaneous frequencies/bands), we can develop send and receive Multimedia Interactive communications - this could become much more advanced than the standard 'Video Conferencing' available at present.

Television Production Techniques has to change and adapt as the technology & the way it is used, changes. I hope I have put a few thoughts in peoples minds in this respect and that you can see the relevance to having our Production Techniques 'up to the mark' to explore and develop the *new opportunities* Multimedia opens up for us.

I would like us to look back as well and I am keen on us putting on Television Production style events to attract the public and the media. We have a lot going for us, with almost a complete history of Television technology available. If BATC get enough volunteers come forward there is much we can do in this area. Maybe we can approach the BBC at some stage - particularly at the time of a significant anniversary (I see that BATC has one coming up in 1999% for support and coverage of a re-enactment of '*Television in the old days*'. A joint venture would be very much a 'benefits all round' event.

Please send your comments to me at my works address:

Norman Ash
DMU - Bedford
Polhill Ave
Bedford
Beds Tel: 01234 351671 Ext 238
MK41 9EA Fax: 01234 217738

Update on 23cms ATV Repeaters

By Graham Shirville G3VZV

I am pleased to report that the RSGB finally managed to get a meeting with the CAA and that it was a most constructive session. A copy of the RSGB news release is below which shows that the rumours of the death of ATV on 23cms were somewhat premature. For future applications the RMG will be doing more research and calculations of path losses between the proposed site and any existing radars to check that there will not be a problem and it may be necessary for the repeater output frequencies to be individually selected. The existing proposals should be back in the system within a couple of months.

1.3GHz ATV Repeaters

A useful meeting was held today with NATS (CAA) representatives to discuss the reasons for the licensing of 1.3GHz ATV Repeaters having been put on hold. The meeting identified certain shortcomings that exist in the present clearance procedures and we intend to raise these as soon as possible with the RA.

It is clear from our discussions that as secondary users the pressures of sharing this band with the primary users will increase rather than decrease in the future. This will lead to the requirement for greater and more careful planning of amateur activities in this band together with the adoption of tighter technical specifications. It was agreed that the existing deferred applications will be shortly re-presented to the RA for clearance after the RMG have completed some additional checks.

We thank the ATV groups for their patience so far. These problems have developed over several years and members will appreciate that resolving them will take some more time. We believe this would be hampered if groups were to make any direct contact with the authorities at this time - please DON'T. Progress IS now being made - please be patient!

J. Gannaway G3YGF - LAC

G. Dover G4AFJ – RMG 22nd June 1995

REPEATER UPDATES AND DEVELOPMENTS

By Graham Hankins G8EMX

Hello all ATVers and welcome to this new feature. There are twenty operational ATV repeaters in the UK and in several other countries too and each represents a considerable engineering and licensing, achievement by those involved. More are planned so if we can increase the sharing of ideas, problems overcome, mods, innovations devised then this may lessen the need to "reinvent the wheel".

Ideas are not just confined to circuits and software - they may be mechanical e.g. a single-tube Alford Slot, or a bracket to mount two Slots end-on. Let others know how you did or, if it didn't work, tell others not to do it!

I have offered to entice - encourage - groups to put forward any ideas they may have had, or how they cured some horrendous problem! If there is too much to fit into the mag then I can list what there is and send on any requests. I often read packet info. about the High Wycombe box, so groups can send text to me @GB7SOL. Otherwise, normal mail. So, PLEASE CO-OPERATE in this, don't wait for a phone call or letter asking "wot's new?"

The Birmingham Repeater Project.

After a lengthy gestation period, permission has been granted for the use of the university's Muirhead Tower. As I am not an "insider" on the campus I have to rely on one of their graduates for most of the progress! However, a few weeks ago, one of the local ATVers who has been active in the Oldbury area for many years let me know that there was the possibility of yet another site! This was confirmed soon afterwards; this other building may offer easier general access etc. so we may be able, by nurturing both sites, to put two (3cm and 24cm) boxes into Brum!

I hope - other groups next time. Meanwhile, 73 and P5!

Graham Hankins G8EMX 11 Cottesbrook Road, Acocks Green, Birmingham
B27 6LE 0121-707 4337 (+ansafone) or via packet @ GB7SOL.

CQ-TV 171

23

GB3HV TELETEXT SERVICE

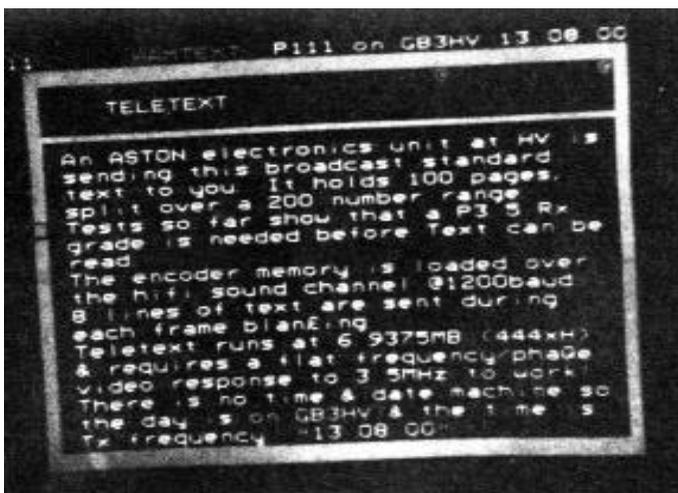
By John Stockley G8MNY

The 625 line UK TV specification as published by the RA, includes the technical specification for teletext. So the High Wycombe repeater is now the first to run a Teletext Service. This has been achieved using an ASTON Electronics Teletext Encoder on the outgoing video.

WHAT IS TELETEXT

Teletext is data that can be sent on TV picture lines 7-22 (GB3HV=11-18) at 6.9375MBit (444x 15.625KHz). It has a 7 bit (+ odd parity) non return to zero data using a modified ASCII code. On GB3HV there are 8 lines of text, 4 sent 50 times a second (after every frame blanking). Data throughput with 8 lines of text is 100 pages (100KByte) in 10 seconds with the pictures.

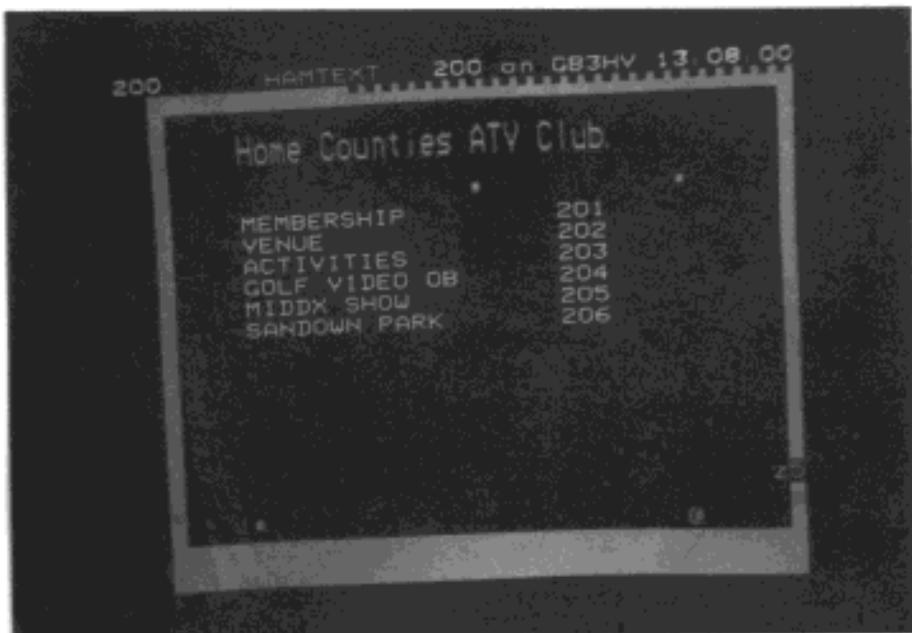
If you look at the Teletext data on your TV you can see that each line starts with an unchanging synchronising preamble of alternate 0 and 1, and FLAG byte. This is followed by changing Magazine No (Hundreds), Page Tens, and Units, further flag, bits then the Page data. The most common data is the SPACE (00100000) Character, which shows up as a white dot and 5 black bits, this forms a recognisable pattern down the 8 (16 on broadcast) lines when fairly empty pages are sent.



ASTON Hardware

The Teletext hardware was bought by G8GOS for £1.50 from a boot sale, it consisted of- remote editor box, keyboard, and picture grabber. But some bits were missing, and getting all the bit going was not on. Mike G8LES managed to obtain a full set of drawings, therefore fault finding was possible. Fortunately the important part: Memory and encoder unit, was complete, so sending data to that from a PC became the main task. G4K0H of ASTON's technical dept, came up with a detailed description the comms protocol which gave most of the answers.

Video synchronising to Amateur signals (even with reprocessing) was a problem, as the unit was only designed for perfect crystal locked video. G8LES added TV timebase circuits to improve locking range and overcome false video clamping.



After several trials the now highly modified unit was put on air, on 17/11/94, and demonstrated at February's RSGB Sandown Convention.

HAMTEXT Service

"HAMTEXT" was chosen as the service name, being a short name, it was fairly easy to swap it letter by letter in an EPROM programmer from the extracted obsolete PROM data. However there is no date and time machine on the unit, so the date is now "on GB3HV" and the time display is fixed as the Tx frequency "13:08:00"

We have split the available 100 pages, over a 200 number range (100-299), by using a memory slot address line, to toggle the Magazine number (Hundreds), every 16 memory page slots.

Pages 100-195 are for GB3HV NEWS, details about HV's facilities.

Pages 196-199 are fixed EPROM based Standard Test pages.

Pages 200-249 are for Home Counties ATV Club, events, membership

Pages 250-299 are for HV Users information, Location modes etc.

The Main Menu Page 100 is placed 3 times down the sequential memory page slots, giving 3 times faster access. Each of the 3 Page 100s has a single word colour change, giving a moving colour display.

TELETEXT PAGES on a PC.

This proved to be quite difficult on a PC, as many of the Teletext control codes for changing modes to:- Colours, Text, Graphics, Mosaic, Flashing, Subtitle, Double height etc. are ones used which are used to control text editors on a PC, and are not possible to keyboard enter.

A solution to this is to put (using a HEX editor) the most useful codes in the unused portion of the first 2 lines in each page file, so they can be copied and pasted with a normal editor. This worked well except for the double height command, which is a <CR>, this had to be specially edited into the required lines with the HEX editor after the page was composed, then not touched again with the normal editor.

Sending Pages to GB3HV

This is done over standard RS232 interface. To permit simple one way data, the data block check system on the Memory unit was disabled. The hi-fi sound channel was chosen for the data uploading, but fine Radar pulse QRM upset 9.6KB high speed baseband data, so a slow 1200 Baud FSK modem (V23) system was used with

greater success. To stop the possibility of normal Rx audio corrupting the ASTON memory the modem carrier detect time was made 5 seconds!

All 100 the pages can be uploaded from disk in 15 mins, if the volatile memory is lost. The Memory PSU has not been battery backed up but it has been changed from a hot linear design to an efficient chopper design and reservoir caps beefed up, in an attempt to make keep the memory valid over poor mains.

Rx Teletext

To decode the service you need a picture grade of P3.5, and a flat video frequency and phase response to beyond 3.5MHz, (why it fails with VCRs) before Text can be read. The Teletext TV is best fed with baseband signal as if you were using a satellite Rx system.

RSGB Sandown VHF Convention

Aerials pointed at GB3HV (40KM path) consisted of 24 element 23 & 24cm aerials, these were set up on 10' poles on the grandstand as far apart as possible. They gave good repeater look through at nearly P5. The display consisted of 3 monitors, showing the picture, teletext, and one display showing the actual interfield data. A variable power ATV TX, demonstrated just how well GB3HV's genlock circuit designed by G8LES, hold on to weak signals in full colour lock down to P0, to the amazed TV professionals at the show.



THE GREEN MACHINE

Dicky Howett recalls the development of the EMI 203 Image Orthicon studio camera.

The development of any new television camera system is complex. In 1936, at the start of 'high definition' television, every technical idea or improvement was an innovation. Old and grizzled engineers will tell you it was a daily slog getting recalcitrant kit to perform. Achieving any sort of television picture was a real effort and keeping it on the screen, a bloody miracle.

After the war, due mostly to American developments, high velocity iconoscope camera pickup tubes became outmoded in favour of a more sensitive, and controllable low velocity type. This new tube was called an Image Orthicon and it was engineered by RCA. It appeared on the market in 1945. Although the BBC, during the 'austere' late 1940's and early 1950's, was under a severe government capital expenditure restraint, it continued to promote and encourage new designs of camera. This benefited the British electronics industry who wanted desperately to remain within sight of the cutting edge. The Brits certainly didn't relish the prospect of being squeezed TV technologically by the USA. There were far too many lucrative export deals on the horizon, especially to the many emerging 'television' countries.

Eventually new designs of camera were ordered by the BBC who circulated amongst manufacturers (principally EMI, Marconi and PYE) vast 'specifications' detailing what they would most like to see in a new camera channel. These specs covered generally, everything from electronic parameters, down to the exact size of focus handle and even the preferred tone of the casing paint.

Despite the BBC's stringent (and some would say peculiar) technical stipulations, the manufacturers always had the tricky task of both complying with the BBC's needs and ensuring the end product was saleable in world markets. As it turned out, a new EMI camera (called the 203) was based very closely on BBC requirements.

Historically and to put all this into context, it was towards the late nineteen fifties, that the BBC began looking for a new camera to equip its modern Television Centre; soon to be opened at Wood Lane in West London. Also, the BBC needed replacements for its Lime Grove camera stock. At the same time, (1957 or so) those cameras consisted of Marconi Mk 3's and EMI CPS Emitron 10764's. Although both these cameras gave very good pictures, they had the disadvantage of non-interchangeable tubes, and non-interchangeable just about everything else! This lack of standardisation resulted in costly BBC maintenance practices of antediluvian proportions.

The two camera types referred to above were (in 1957) not particularly old, but they were bulky and inflexible, needing a lot of careful handling. What the BBC (and indeed Commercial Television) required for the swinging sixties was a new breed of 'hands off' slim-line image orthicon camera that could run 405, 525 and importantly (with BBC 2 and colour on the horizon), 625 line standards.

A new camera specification was issued, and immediately a contest developed between EMI and Marconi to get the first camera out on test. Eventually, by a few months, (October 1958) Marconi won the race. It installed a prototype model for tests (christened the 'Mk 4' in the BBC's 'experimental' Riverside Studios at Hammersmith.

Back at Hayes, the undaunted EMI 203 design team (headed by F. R. Trott and G. E. Harden-Pigg, with Alan Butcher as development engineer) pressed ahead with their plans. An early version of the 203 was designed to accept not only a 4.5 inch image orthicon picture tube, but also a 3 inch tube and even the outdated CPS Emitron tube! Eventually the design settled down to produce a 4.5 inch image orthicon camera channel (adaptable to 3 inch) of high quality.

The 203 camera head had many new features including eight small plug-in printed circuit component boards (still valve driven in those days) and a novel means of fitting the image orthicon picture tube. Formally, the insertion of the tube had sometimes involved dismantling parts of the cameras. The 203 camera had simply a removable plate on the lens turret through which the picture tube could be inserted into the scan-coil yoke. This removable turret plate could also (with adaptation) accommodate a diascope or even a fifth lens (ABCtv and Associated-Rediffusion used notably the 203 in five-lens mode)

Lens mounts on all new cameras were now standardised to the BBC specification 'TV 88/2' fitting system (both the 203) and the Marconi Mk4 could use the same lenses which included a wide range of Rank Taylor Hobson and Dallmayer fixed focus glassware plus RTH and Evershed/Angenieux power zooms). Also standard on the 203 (and the Marconi Mk 4) was an auto-iris facility. This had the lenses ganged by cogged teeth around the rim of the lens-mount to a central servo motor (the 'baked bean tin') fitted to the lens turret. The iris of all the lenses could then be adjusted from one sweaty knob in the control room.

Overall, the size of the 203 camera was quite compact with the chassis and side panels constructed of light alloy. The body dimensions were only 13 inches wide by 15 inches high, the whole ensemble weighing in at about 108 lbs. The camera had a body length (minus lenses) of only two feet. For a 4.5 inch image orthicon camera this was indeed a midget machine. This welcome reduction in size and weight was helped also, by the compact design of the electronic 7" viewfinder. This was a fixed unit built **into** the body casing, and not, as previously with EMI and Marconi cameras, a separate large tiltable box on top of the camera. (For awkward shots it was now the **cameraman** and not the viewfinder that had to be tiltable!).

The first pre-production EMI 203 camera went to Lime Grove in 1959 for assessment by senior BBC engineer Don Brothers. The camera then went to Riverside Studios for a few weeks. The 203 was put in as Camera One (working beside the existing Marconi Mk 3 cameras) on a production of 'Antigoni' (1960).. The camera worked also on a David Nixon Magic Show and a couple of Hancock Half Hours. After many tests 'on air', the camera was later assessed. Amongst it's many good features, the 203's image depth of field was remarked favourably upon.

By early 1960 the first production models of the 203 were ready. Three camera channels were shipped off to the first purchaser, the Australian Broadcasting Commission for use in an O. B. Van. Three more cameras were dispatched to Italy's RAI in time for the 1960 Rome Olympic Games. Back home, the London weekday Independent company, Associated-Rediffusion installed a total of eight 203 cameras in their new giant 14,000 sq. ft (EMI equipped) 'studio five' at Wembley.

The BBC on the other hand was slightly tardy. It waited until January of 1961 before installing six 203's in TC4 (100ft x 80ft) at Television Centre. TC4 was the second large production studio to open and it became known initially as the 'comedy' studio. Shows recorded there included 'Hancock', 'Comedy Playhouse', and 'Till death us do part', all on 405 lines. Other productions and innovations included the 'Dr. Who' special effect howround opening sequence, recorded with the aid of a patient 203 (plus electric torch and engineer Joe Starie).

Much later, in 1967, TC4's 203's recorded the last major BBC monochrome drama, (bar one episode in the Marconi equipped TC3) 'The Forsyte Saga' on 625 lines. The picture quality was superb. (When expertly lined-up and using a good picture tube, the EMI 203 was capable of resolving at least 600 lines of horizontal definition). Engineers thought arguably, that overall, the EMI 203 was technically a slightly better camera than the Marconi Mk 4. However, cameramen preferred the easier handling and racier looks of the Marconi Mk 4.

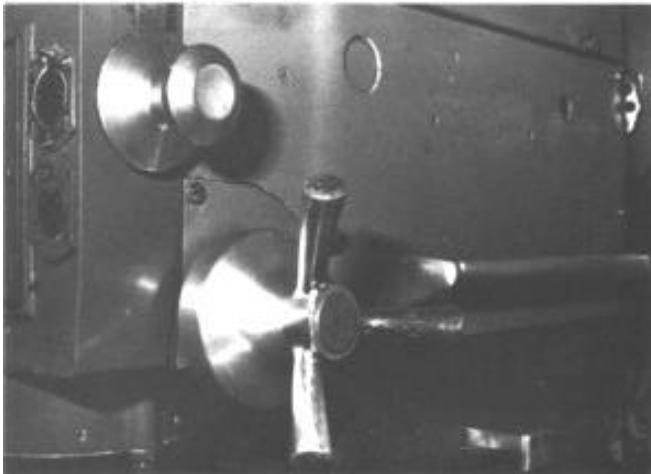
Back at the racks, the 203's engineering control equipment consisted of three relatively compact and well organised electronic boxes that could be conveniently stacked together for O. B. work.

Because of the concomitant stability of low-velocity picture tubes and circuits, the innovative BBC designed (mainly) 'one man vision control' system was now possible. Also a senior BBC engineer called Ben Palmer researched and devised a test slide procedure that enabled all I.O. cameras to be lined up more precisely to within half a stop and require only about 5% adjustment of lift and gain (brightness and contrast). This was a significant development, reducing the number of 'on air live' operational controls to just two (lens iris and black level). A studio's compliment of up to six cameras could now be controlled by one engineer in the vision control gallery. In practice however, there were at least two back-up engineers constantly checking settings of the pre-set pots: beam focus etc.



The 203 camera wasn't without its share of technical troubles. Early on a problem occurred with its German WIMA capacitors which had a habit of short circuiting at inconvenient moments. Tempers flew and so did the possibility of writs. However, the BBC and EMI workshops replaced all the WIMA's and modifications were called for speedily. Also, the BBC wasn't satisfied with the mechanical focus linkage which moved the image orthicon scan coil yolk in relation to the lens. It created unacceptable backlash to the tube casing it to twist sideways out of line. To overcome this problem, EMI re-designed the mechanism and re-positioned the focus handle further back on the side of the camera body. The original yolk transport mechanism was then replaced on the BBC cameras (all this within a few months or so of the original installation in Studio 4) by a more robust rack and pinion device, similar to that of a microscope. (All earlier models of the 203 show the blanked off hole, a bit of green plastic, where the original focus handle went. This 'make do and mend' policy was utilised because EMI usually didn't change the casing pressing designs until at least 100 units had been previously run off). Another little snag with the original 203 design was caused by the camera body cable connector. This jutted the BICC Mk 4 cable straight out of the side of the camera, posing problems on the studio floor. This meant that manoeuvring the camera through narrow doorways, or tracking across confined sets could easily put an eye out. (Later designs used more compact right-angled connectors).

Outside the privileged confines of the BBC, the doughty 203 still had to earn its development costs. More 203 cameras were sold, some to Southern Television who shot the Canterbury enthronement of Dr. Ramsey and some to ABCtv at Teddington who shot 'The Avengers'.



Three gleaming 203's popped up also in the Beatles' film 'A Hard Days Night'. In one scene, the Beatles are shown on stage at a 'television theatre' (in reality, the Scala theatre, since demolished, in Charlotte Street, London). During musical numbers with the Beatles, the three 203's are electronically live, producing many monitor shots of stunning quality. To capture these shots the 35mm movie camera's shutter speed motor was hand adjusted to counteract monitor 'hum bars'.

A story goes that the American Broadcasting Company in New York acquired a 203 for tests. They installed it in their Manhattan studio basement workshop. Unfortunately, the engineers kept losing the viewfinder picture. It flashed on and off at odd moments. At other times it was okay. Eventually the cause of the fault was traced. It was all due to the subway trains which, as they rumbled by under the basement floor, caused cabling in an adjacent store room to 'sway', setting up a magnetic field, and the cure? To encase the 203 camera in 0.25 inch steel plate.

Very pretty.

In April 1964, TC1, the largest studio at Television Centre (108ft x 100ft) was opened, and it was equipped with six 203's (now designated 203/6). (TC5 had opened earlier in August of 1961 with four 203/4's). TC1 was now ready for the advent of BBC2. In fact TC1 started big. The studio mounted the 1964 General Election broadcast.

As the nineteen sixties progressed, more 203 channels were sold: to TWW, RTE, CBC Vancouver, Nigerian TV. Meanwhile, nearer home at Lime Grove, the final phase of monochrome re-equipping was taking place. The production studios (D and G) were each furnished with four new 203/9's. (Studio E had been refurbished much earlier in July 1961. Studio H was converted to experimental 625 line colour). By the mid-1960's the BBC had a grand total of six London studios with thirty (give or take a few spares) EMI 203 camera channels, all whirring away busily. The EMI 203 model ceased production in 1965. An estimated total of 350 of these camera channels were sold world-wide.

Three decades later, the venerable viridian EMI 203 is still around to amaze and entertain. The author owns three examples (one fully operational) and others exist in museums and private hands. Recently, one incomplete ex-BBC 203 camera was found in a store room at Alexandra Palace, (it is now on display there as part of an AP TV exhibition). Yet another turned up near Minehead in the Washford BBC radio transmitter building (now occupied by 'Tropiquaria' and the 'Wireless in the West' attraction).

Several British TV companies added individual modifications to their 203's. For example, the BBC's 203 power supply unit came in a grey (not the usual green) casing. All helpful clues along the way. (Interestingly, it is far easier to track the working life of BBC **lenses**. Latterly in BBC studios they were colour coded. The practise was to put a small colour strip on the side of each leans mount. By this simple means, kit could be kept together, or retrieved. The colour code was in fact the resistor colour identification system. (For example, if a BBC lens was striped brown the code meant TC1, or red for TC2 or yellow for TC4, etc).

All in all, tracing the working life of these ex-BBC 203 cameras is highly tortuous. It appears that most documentation (and prototype plans) was destroyed. Written records concerning studio camera use were not properly kept, nor indeed much required. No paperwork of any kind appears to remain. (Understandably, there was no historical imperative. Who would have guessed at the time that today EMI no longer manufactures broadcast TV camera equipment, nor indeed does **anyone** in Britain!)

During the 1970's because of the swift spread in the UK of colour TV, redundant monochrome broadcast equipment migrated around the world. Several ex-BBC 203's ended up in Greece. Australian TV (ABC) took a few channels to tide themselves over before they too colourised. Third world and Eastern block countries also benefited. Back home, universities and colleges sported complete EMI 203 studio sets. Even public utilities such as Gas, Electricity and Transport trained and gained by the use of broadcast quality cast-offs. They never had it so good.

With the total demise of monochrome television, sadly, the inevitable final 'public utility' for most of these remaining EMI 203's was the council rubbish skip.

Slightly different versions of this article have appeared in '405 Alive', 'Zerb' (the guild of TV cameramen's magazine) and as a lecture at CA T 94.

FORTHCOMING ATTRACTIONS

Date	Event	Contact
19th/20th August	Stafford A/Radio & Computer	01923 893929
20th August	Great Eastern Rally, King's Lynn	01553 765614
20th August	West Manchester 'Red Rose' Rally	01204 62980
25th-28th August	A/Radio Caravan & Camping Rally	01494 531755
27th August	East Coast Rally, Clacton	01473 272002
27th August	Torbay ARS Annual mobile Rally	01803 842178
28th August	Huntingdon Rally	01480 431333
2nd September.	Annual Wight Wireless Rally, Newport	01983 567665
3rd September	Vange Rally, Laindon	01375 859632
3rd September	Bristol Radio Rally	01275 834282
10th September	Southend Rally	01702 353676
10th September	Lincoln Hamfest	01522 531788
17th September	Peterborough Rally	01733 331211
24th September	Harlow Rally	01850 487863
24th September	North Wakefield Radio Club Rally	01924 825443
24th September	The Three Counties Radio Rally	01905 773181
1st October	The Great Lumley A/Radio Rally	01207 237927
8th October	Kidderminster & DARS Rally	01384 894019
20th/21st October	Leicester Rally	01162 871086
29th October	Hornsea ARC Rally	01964 532588
4th/5th November	North Wales Radio/Computer Rally	01745 591704
12th November 9787	Mars-Stockland Radio/Computer Rally	0121 422
19th November	Bishop Auckland RAC Rally	01388 766264
26th November	West Manchester Radio Club Rally	01204 62980
3rd December	Verulam	01923 22284
3rd December	Thames Valley Electronics Rally	01494 450504

1996

4th February	South Essex ARS Radio Rally	01268 697978
28th April	The BATC Rally (Don't miss it!)	01788 890365

If you are having an 'event' and you wish to advertise it here (at no charge!), please send the details to 'The Editor, CQ-TV' 19 Ravendale Road, Gainsborough, Lincs. DN21 1XD Tel/Fax.. 01427 614788 Mobile 0589 631104

TV ON THE AIR

By Andy Emmerson G8PTH

LETTER FROM NEW ZEALAND

Here's an unusual letter; it comes from Paul Brckel, whose address is Rooksmoor, 1076B Waihopai Valley, RD6 Blenheim, New Zealand (tel/fax: 00 64 3-572-9972). He writes: I am not certain, but I think we met a few years ago at the Crick rally when I was G8FNA. Since then I have emigrated to New Zealand, and miss the ability to get a lot of the goodies I used to pick up at the rallies.

"I am writing to ask for both your advice and possible help with obtaining a lens for a project that I am working on during the winter evenings. I am attempting some wild animal video photography, and have just finished building an image intensifier assembly to go in front of the video camera for night work. However using even a 10x lens I find that getting close enough to fill the screen with the subject is difficult (especially when I am on the wrong side of a raging river!), even rolling base over apex in the dark on one occasion whilst holding on to my valuable camera and video gear, and with increasing years I now value my bones much more!

"I have been attempting to get details of the 30x Schneider zoom lenses and similar (used on Philips LDK5 camera?) having seen these advertised on occasions. Unfortunately despite telephone calls to UK, I have not managed to get any response from the advertisers. I understand that these type lens assemblies are quite large and 'built-in' to the camera - this does not unduly bother me as mass will obviously help overcome camera shake, and invariably I use a tripod.

"If you could possibly comment on these types of lens or suggest any alternative of a similar zoom range I would be most grateful - I have seen one such lens and camera for £50.00, is this the sort of price I can expect to pay in your opinion? Knowing your involvement with BATC and older TV equipments, I thought you might be the right man to ask, to put anyone who has such a lens in touch with me. I can arrange payment via a UK bank, and even a UK delivery address if they didn't want the hassle of posting overseas. My thanks for your time in reading this and hope you don't mind me writing."

I replied to Paul that I wasn't in a position to help directly, if only because any camera with Philips on the side is far too modern for me! It is interesting that surplus television equipment is getting so scarce these days; I haven't seen anything remotely interesting at any rally I have attended this year, so I don't think Paul is missing anything over here. In fact I thought all the good stuff was still in New Zealand! Anyway, if anyone can help Paul, please write to him direct.

REPEATER NEWS

GB3GV near Leicester is still off the air but GB3UD (Stoke-on-Trent) is back. All other operational units are active except GB3WV in Weymouth, which has been closed by the operator because of lack of support. Apparently this repeater was up for sale at the BATC rally (I missed the event).

DSI: DO OR DIE!

The Government's DSI or Detailed Spectrum Investigation has the task of reviewing the use of the VHF and UHF radio spectrum; many of the allocations have not been changed for years, even though many new uses have been devised for radio. Inevitably the amateur bands come under pressure and commercial users point out with some justification that they could make more regular use of 'our' bands and put more licence money into the Government's purse to boot. The 70cm in particular is being eyed enviously for business radio use and in many (not all) areas this band has little use most of the time.

To ATV operators 70cm is particularly important, since it is the lowest band capable of supporting conventional wideband television signals. It is also relatively economical for newcomers to equip an ATV station. Nonetheless it is quite possible that we shall lose at least 2MHz of spectrum on 'seventy', which would put paid to ATV as we know it there. The Radiocommunications Agency has received representations on behalf of the amateur community from the RSGB, who have put forward the BATC viewpoint on behalf of all ATVers. It is suggested that some other frequencies may be made available to compensate for the loss of 70cm, including half a megahertz at 915.50 - 920.00MHz, on a secondary basis of course, but this will be cold comfort to ATVers. Of course, if the band had been actively occupied by ATV transmissions, this discussion might never have happened, proving the old expression 'Use it or Lose it'.

EXPERIMENTATION AHEAD

No decision has been taken yet, so retaining the current allocation on 70cm does remain a possibility. If we do lose it, however, what to do? With very efficient filtering we could radiate limited bandwidth monochrome pictures (the Germans call this SATV, i.e. narrow bandwidth ATV) and it is very effective for DX working when highly detailed pictures are not a consideration anyway. Given the amateur tradition of experimentation, it might be better to start considering digital techniques.

To produce moving pictures, exploiting current information compression technology, you will need a data rate of at least 1Mbit/s, occupying an RF bandwidth of 1.5MHz minimum. Initial thoughts are that we should use orthogonal frequency division multiplex (OFDM) which is a more spectrally efficient form of modulation than AM or FM, and that we should look at the technology coming out of digital video recorders. Data-VHS or D-VHS has just been announced and this might be a fruitful starting point, although even D-VHS won't be on the market for a few years yet. NTL has already demonstrated extremely good pictures using OFDM and MPEG-2 coding with test transmission on channel 34 from Crystal Palace; at 1kW the power level was far below what we need for AM television, yet pictures were better. The future really does look very rosy with digital.

According to Henry Ruh KB9FO, one of the BATC's two representatives in the USA, it's important to be aware that digital television has some constraints as well. He writes: "Digital video takes more spectrum than analogue unless you use very expensive encode/decode/digital compression. The unwanted artefacts are awful. Also 70 cm is the only DX band here in the States. There is no DX worked on 900 and 1200MHz and virtually no users of these bands outside of a few groups (namely South California and a few pockets of 900MHz interest in Pennsylvania, Florida, etc.)."

Of course, we don't have the advantage of an ATV allocation on 902-928MHz in Europe but this makes interesting reading nonetheless.

INTERNET ALERT

Right, that's got some people awake (the rest have turned over the page in disgust). Are you on the Internet? If so, you'll be pleased to know there is an ATV service where any news items, queries and answers are mailed automatically to all who find them of interest. Here's the low-down...

Welcome to the ATV Information Server! The ATV ListServe run by Doug Ferrell, KD4MOJ, is open to any and everyone who has an interest in Amateur Television (ATV). The ATV ListServe is like a mailing list for E-Mail in that all messages addressed to "ATV@exchange.tlh.fl.us" are reflected to all users who are participants of this list. In this way, a discussion on ATV equipment, information or products are redirected to each participants personal E-mail account no matter where you receive your mail (AOL, CompuServe, Freenets, Internet providers etc).

The ATV ListServe was created by me because I am interested in ATV and there is little on-line information out there. I have had to savour every bit of information that I run across from magazines (ATVQ is excellent! - a little plug) so maybe online input will help those that are new to this exciting hobby such as myself.

Now for the particulars of this list. . To add yourself to the list, send a message to ATV- Request@exchange.tlh.fl.us with the following words in the body of the message: ADD JOIN SUBSCRIBE. You can also delete yourself from the list by including any of the following commands in the body of your message: DELETE UNSUBSCRIBE REMOVE. Address a message to ATV@exchange.tlh.fl.us to have your message redirected to the ATV ListServe for others to read and enjoy!

Alternatively, address a message to Doug, KD4MOJ, at one of the following addresses if you have any questions or comments: doug@exchange.tlh.fl.us or kd4moj@exchange.tlh.fl.us.

Phone lines, all USA: (904) 575-6577 Voice
(904) 575-7900 BBS
(905) 575-6577 Fax.

Hope to see you on-line!

MORE FUN ON THE NET

And that's it. I myself have been connected for a fortnight and have already seen several interesting messages. There are several ham radio conferences on Usenet, although I haven't explored these yet... I waste enough time in the CP/M, obsolete computer and telecomms forums (or is it fora?). If you know any good Internet addresses and Usenet groups, do write in and share them with us. I did also find instructions for 'How to Build Your Own Underground Television Transmitter Using Commercially Available Parts' The file, in Usenet/alt.2600, starts "Yes, for some time now it has been possible to construct a clandestine television station, which you can operate from your Telecommando Lair, or modify for Mobile Media Guerrilla campaigns. We have named this device the Snow Box, due to its cool nature, and the snow seen on blank television channels waiting to be commandeered... "

Much of the information was along the right lines, although as always, there was not quite enough information to actually build a station! Fascinating stuff if your aim in life is to overthrow the State! Normal service will be resumed by next time, meantime keep those letters and photos coming.

NOTICE TO QUIT

Yes, notwithstanding the last sentence, I wish to make known that I think I have been holding this frequency long enough and would like to hand over the ON THE AIR slot to someone else, preferably with a closer connection to on-air amateur television activity. It may surprise some of you that I have not transmitted ATV for eight years, and after fifteen years of conducting this column (yes, it's that long!), I think I have 'done my bit' and am ready to hand over to someone more qualified. I'll be happy to give on the job training and advice, whilst if anyone wants to ask exactly what the job entails, I'll be happy to explain.

But in a nutshell, it just means receiving interesting letters from all round the world (very few expect replies), sorting them into some kind of meaningful order and then selecting the best bits for this column. When there aren't any letters you just invent names and callsigns or imagine some contacts that the regular names might have made. You are welcome to add comment of your own, even stir up a bit of muddy water if the fancy takes you. There's no pay as such but by negotiation you could also take over my slot in Practical Wireless and those articles are definitely paid for!

Contact myself or the editor of CQ-TV if you're interested.

BATC MEMBERS' SERVICES PUBLICATIONS

PUBLICATION	EACH	QTY	TOTAL
AN INTRODUCTION TO AMATEUR TELEVISION (225gm)			
By Mike Wooding G6IQM & Trevor Brown G8CJS			
The latest handbook full of detailed information on how to set up your ATV station, plus lots of new video and RF construction projects	£5.00	.....	.....
SLOW SCAN TELEVISION EXPLAINED (275gm)			
By Mike Wooding G6IQM			
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.	£5.00	.....	.....
THE AMATEUR TV COMPENDIUM (155gm)			
By Mike Wooding G6IQM			
The BATC handbook featuring construction articles on video units, 24cm and 3cm ATV, a Digital Frame Store, and much more.	£3.50	.....	.....
THE BEST OF CQ-TV (150gm)			
Compiled by Mike Wooding. G6IQM			
A compilation of the best construction articles from CQ-TV's 133 to 146	£3.50	.....	.....
CQ-TV BACK ISSUES: The following issues are still available. Please circle those required:			
144,147,150,153,154,155,156,158			
159,160,161,162,163,164,166,168	£1.50	.....	.....
Special Offer: Any four issues	£5.00	.....	.....
TOTAL THIS PAGE		£	
Members' Services Supplement CQ-TV 171			SUPP 1

PUBLICATION	EACH	QTY	TOTAL
-------------	------	-----	-------

INDEX (40gm)

All main articles in past issues of CQ-TV and seven handbooks. including page count, (essential for ordering re-prints)

	£1.00
--	-------	-------	-------

RE-PRINTS

Photocopies of any article from past publications are available. Please quote the issue number, page numbers and article name. Discounts as shown, prices are per sheet:

1 to 5 sheets	£0.25	.....	.....
6 to 10 sheets	£0.20	.....	.....
11 to 20 sheets	£0.15	.....	.....
21 sheets and above	£0.10	.....	.....

CQ-TV BINDERS	£3.50
----------------------	-------	-------	-------

TOTAL GOODS THIS PAGE	£
TOTAL FROM PREVIOUS PAGE	£
EXTRA POSTAGE (Overseas members only)	£
TOTAL ENCLOSED	£

PLEASE MAKE CHEQUES PAYABLE TO 'BATC'

The above prices include postage within the EEC. Will members outside the EEC please either try to estimate the extra postage required, or write for a quotation. All cheques **MUST** be drawn on a UK bank. (Eurocheques are acceptable). Send orders for publications **ONLY** to: **BATC PUBLICATIONS, 14 LILAC AVENUE, LEICESTER, LE5 1FN ENGLAND**

Name:		Mem No:		Callsign:	
Country:		Zip/Post Code:			

MEMBERS' SERVICES

Items from these lists can ONLY be supplied to CURRENT members of the BATC
 These lists supersede all previous ones. Components for club projects are NOT
 available from Members Services unless within these lists.

PUBLICATIONS should NOT be ordered on this form. A separate form is
 provided for that purpose elsewhere in this suppliment. We reserve the right to
 change prices without notice.

Members requesting information on prices, equivalents or availability of vidicon,
 leddicons or other types of camera tube are asked to send a stamped, addressed
 envelope for their reply.

QTY	CAMERA TUBES, SCAN COILS, BASES & LENS MOUNTS	EACH	P&P	TOT
		£	£	£
3	.....One inch vidicon base	1.20	0.30	
4	.....2/3 inch vidicon base	0.80	0.30	
5	.....C-Mount for lens	5.00	0.30	
6	..... Camera tube (see above)		1.20	

QTY	VIDEO CIRCUIT BOARDS/COMPONENTS	EACH	P&P	TOT
11	..... Character generator PCB	4.70	0.43	.....
66	..... TEA2014 video switch IC	1.30	0.30	.....
12	..... Teletext pattern PCB	3.50	0.43	.....
13	..... Greyscale/Colour bar generator PCB	3.50	0.43	.....
82	..... Monochrome pattern generator PCB	** 2.35	0.30	.....
16	..... PAL colour coder PCB	7.00	0.43	.....
18	..... TEA2000 colour coder PCB	** 2.35	0.30	.....
19	..... Video filter PCB	1.20	0.30	.....
27	..... A-D and D-A converter PCB	** 5.90	0.43	.....
32	..... UVC3130-09 A-D and D-A IC	** 47.00	0.30	.....

TOTAL GOODS THIS PAGE £

QTY	VIDEO CIRCUIT BOARDS/COMPONENTS	EACH	P&P	TOT	
40	..... 12C CPU PCB	10.00	0.70	.....
41	..... 12C VDU PCB	10.00	0.70	.....
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	..... LM188 IN Sync seperator IC	3.50	0.30	.....
81	..... 12C 27256 EPROM (Please quote callsign or caption required and membership number)	9.70	0.30	.....
36	..... 12C 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	..... 12C Relay PCB	6.50	0.43	.
9	..... PCF8574A Input expander IC	4.70	0.43	.....
20 Video processing amplifier PCB	**	4.70	0.43
21 Vision switcher matrix PCB	**	4.70	0.43
22 Vision switcher logic PCB	**	4.70	0.43
25	..... 4 Input TEA5114 vision select PCB	3.50	0.43	.....
67	..... TEA5114 video switch IC	1.75	0.30	.....
26	..... Video level indicator PCB	5.90	0.43	.....

QTY	RX, TX AND SSTV PCB's/COMPONENTS	EACH	P&P	TOT	
51ATV up converter PCB	**	2.60	0.30
47	..... 70cm downconverter PCB	10.60	0.70	.....
83	..... 70cm ATV transmitter PCB	14.70	0.70	.....
50	..... 108.875 Mhz crystal	8.20	0.30	.....
88	.....XR215 phase locked loop IC	3.50	0.30	.....

TOTAL GOODS THIS PAGE £

QTY	RX, TX and SSTV PCB's/COMPONENTS		EACH	P&P TOT
87	....ASTEC AT2352V Module	**	53.00	1.20.....
84	....24cm ATV receiver PCB	**	16.50	0.70.....
	Items 87 and 84 are only supplied as a set			
85	....24cm ATV transmitter PCB		17.60	0.70.....
86	....24cm solid state amplifier PCB		9.40	0.43.....
53	....FM ATV demodulator PCB		3.50	0.43.....
54	....24cm GaAsFET converter PCB	**	4.0 0	0.43.....
55	....Gunn diode modulator PCB		3.00	0.43.....
56	....10Ghz head unit PCB set		11.00	0.43.....
57	....Tunable IF PCB		3.00	0.43.....
58	....6MHz audio subcarrier generator PCB		3.00	0.43.....
59	....G3WCY SSTV scan converter PCB set	**	11.75	0.43.....
60	....G4ENA colour etc. SSTV mods PCB set		5.90	0.43.....
61	....G4ENA SSTV transmit mod to WCY 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.....
35	....FLEX PROM blower PCB	**	5.90	0.43.....
46	....4 Rail power supply PCB		3.50	0.43.....

QTY	STATIONARY & STATION ACCESSORIES		EACH	P&P TOT
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.....

TOTAL GOODS THIS PAGE £

TOTAL GOODS FROM PREVIOUS PAGES	.....
ADD POSTAGE	.....
TOTAL GOODS AND POST	.....
 TOTAL AMOUNT ENCLOSED	.....

PLEASE MAKE CHEQUE PAYABLE TO 'BATC'

Items marked thus: ** are available only until present stocks are exhausted. Order: please to: **Mr. P. Delaney, 6 East View Close, Wargrave, Berkshire, RG10 8BJ England.** Tel: 01734 403121 (Evenings/Weekends only please).

We reserve the right to change prices without notice.

BATC Members Services does not hold stocks of **BATC publications** and vice versa. Please send publications orders to BATC Publications. 14 Lilac Avenue. Leicester. LE5 1FN England.

Overseas Members should ask for a quotation of postage costs and acceptable forms of payment **BEFORE** ordering from Members Services. Please enclose an International Reply Coupon for reply. **CHEQUES** should be made payable to 'BATC' and should be for British banks only please. in pounds sterling.

MEMBERS SERVICES Items from these lists can **ONLY** be supplied to **CURRENT** members of the BATC. Please note that **ONLY** the items listed in the **CURRENT** 'Services for Members' leaflet are available. A description of most of the various PCB' s and components can be found in the 'What's What' supplement sent with CQ-TV 149 (Copy available on request. if you send me 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. Payment should be by cheque or crossed postal order in favour of 'BATC' - do not send cash or stamps please.

Name:		Mem No:		Callsign:	
Country:		Zip/Post Code:			

VIDICONS

1" vidicon tubes are available in different heater ratings (95mA and 300mA) normally 6" long, although some were only 5.25" long. 2/3" tubes have 95mA heaters. The 'standard' tubes were of separate mesh construction, with magnetic focus and deflection. Other tube types include electrostatic focus or deflection, and low light types. Prices vary depending on the size, type and grade of tube. A tube guide appears in CQ-TV 149 and 150. The stripe filter tubes used in domestic type colour cameras are not available through the BATC, and normally must be ordered direct from the equipment supplier.

Members requesting information on availability, prices or other types of tube or equivalents are asked to send a stamped, addressed envelope for their reply. Please note that the relatively inexpensive 'amateur grade' tubes are no longer available to the club, although ex-equipment tubes, suitable for test/line up of cameras can often be supplied.

CIRCUIT DETAILS can be found as follows:

Revised ATV Handbook (vol 2): PCB's 21, 22, 53

An Introduction to ATV: PCB's 10, 18, 25, 40, 41, 82, 83, 84, 85,86

TV for Amateurs: PCB 19

Slow Scan TV Explained: PCB's 59, 60, 61, 62

Amateur TV Compendium: PCB's 11, 12, 27, 54, 55, 56, 57

Micro and TV projects: PCB's 14, 33, 34

CQ-TV (Issue No. in brackets): PCB's 13(128), 16(134), 20(130),
26(142), 35(143), 58(139)

Item 46 is supplied with circuit details, etc.

BATC Publications can supply back copies of the original articles if required.

Creative Video Associates Limited

CVA House, 2 Cooper Road, Thornbury, Bristol
BS12 2UP

Tel: 01454 281858 Fax: 01454 281868

We have six Electrocraft VMAB 80 composite mixers, audio follow video, with ten wipe effects, key signal input, cut, wipe and fade.

The mixers are quite small and very suitable for ATV shack use, all are in good condition and will be checked before despatch.

Price is £50 each plus VAT

We always have a good selection of used video equipment for sale, phone for details

NARROW BANDWIDTH TELEVISION ASSOCIATION

The Narrow Bandwidth Television Association, founded in 1975, specialises in the mechanical and low definition aspects of ATV, and offers genuine (moving) TV within a basic bandwidth of 6-7KHz. The techniques, basically an updated form of the Baird system, are a unique mixture of mechanics, electronics and optics. Membership is open World-wide on the basis of a modest yearly subscription (reduced for BATC members), which provides an annual exhibition and quarterly 12-page newsletter, together with other services.

For further details write to: **DOUG PITT 1 BURNWOOD DRIVE, WOLLATON, NOTTINGHAM, N28 2DJ.** Telephone_01602 282896.

SATELLITE TV NEWS

By Paul Holland G3TZO

With this years Cable & Satellite Exhibition at Olympia now a distant memory and with Arianespace back on track with their launch schedule, Satellite broadcasters are gearing up for the launch of numerous new analogue and digital services. We have a full post bag and many channel changes to report on this month so let's get straight on with the details.

NEW CHANNELS

COM TV

The German music channel COM TV has finally been granted a licence from the German authorities and plans to launch on September 1st. The most likely home for COM TV is a vacated Tp on Eutelsat II F1, probably Tp 22 L. 11.146 GHz (H) currently occupied by Viva2.

Tele 55

The French channel Tele 55 will launch around Christmas on a Eutelsat satellite as the belated successor to La Cinq which used to transmit from Telecom 2B. No Tp details are available however there are reports that the channel is ultimately looking for a Hot Bird 2 allocation.

BVN TV

The Dutch public broadcasters are to launch a new service aimed at foreign countries called

"The best van Nederland TV (BVN)". The channel will probably share occupancy on Tp 32 11.554 GHz (H) with TV Plus and will broadcast news and programming from Nederland 1,2 & 3.

SBS6 TV

new channel for Holland called SBS6 has been announced by Scandinavian Broadcast Systems. The channel is scheduled to open on August 26th and looks likely to take a Tp on DFS Kopernikus 2 at 28.5 Deg E.

German Weather & Travel Channel

This channel has now been granted a licence by the German authorities and looks set to open on DFS Kopernikus at 23.5 Deg E when it commences operation. No date is yet available.

LAUNCH NEWS

July should have seen the launch of the Israeli AMOS satellite aboard an Ariane 44L launcher. Manufactured and operated by Israel Aircraft Industries AMOS 1 will be located at 4.0 Deg W. Power at beam centre on the middle east spot is 54.87 dBW. Power at beam centre on the mid European beam (centred on Hungary) is 55.63 dBW. A third spot beam is included in the spacecraft design but no details of its target area are yet available. There are 7 active Tp's with a bandwidth of 72 MHz and capable of carrying two analogue services plus digital simulcasts each.

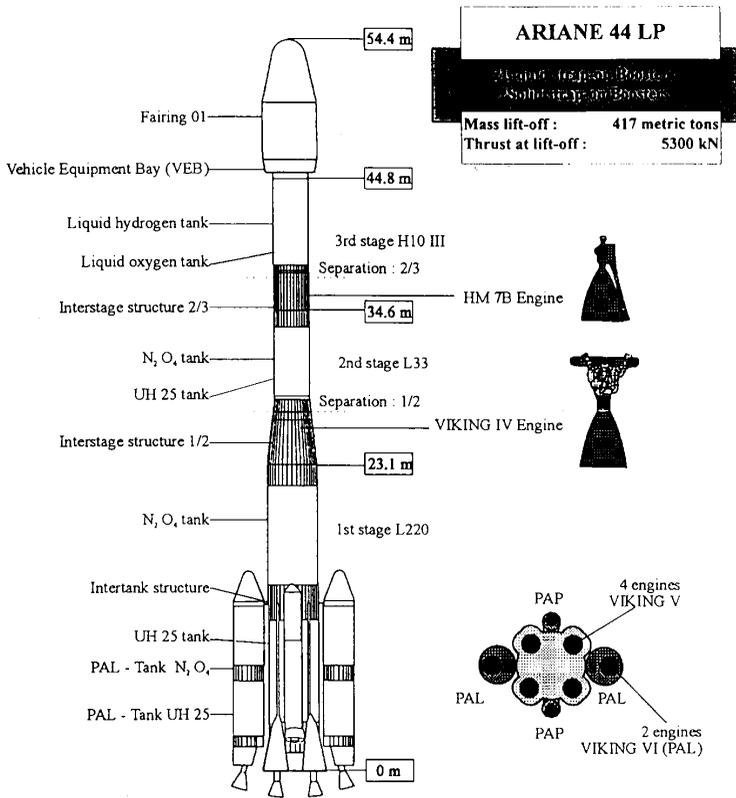
Telecom 2C will launch in October from Kourou aboard an Ariane 44L launch vehicle and will be located at 3.0 Deg W. It is likely that channels currently carried by Telecom 2B at 5.0 Deg W will move to Telecom 2C to allow a concentration of new digital services at 5.0 Deg W.

October should see the launch of Astra 1E on board an Ariane 42L launch vehicle. With the slow take up on Astra 1D it remains to be seen what developments will occur on this satellite over the coming months.

INTELSAT NEWS

Intelsat 510 has moved to 57.0 Deg E replacing Intelsat 507 which has transferred to

47.0 Deg E. Intelsat 705 has now taken station at 50.0 Deg W replacing Intelsat 506 which takes over from Intelsat 504 at 31.5 Deg W. Intelsat 504 is now at the end of its life and will be taken out of service. Following its launch in May aboard an Ariane 44LP launch vehicle Intelsat 706 is now located at 53.0 Deg W. The satellite provides complete coverage of the entire continental United States, all Latin America, much of Canada, Western Europe and part of Africa. Intelsat 706 has a total of 40 transponders, 26 at C-Band and 14 at Ku Band and came into operation at the end of June.



EUTELSAT NEWS

With the successful launch of HOT BIRD 1 we can now look forward to the launch of HOT BIRD 2 in August 1996 and HOT BIRD 3 towards the end of 1997. The following frequency plan for these two satellites has been released by Eutelsat.

HOT BIRD 2

Tp 50 11.72748 GHz (V)
Tp 51 11.74666 GHz (H)
Tp 52 11.72748 GHz (V)
Tp 53 11.78502 GHz (H)
Tp 54 11.80420 GHz (V)
Tp 55 11.82338 GHz (H)
Tp 56 11.84256 GHz (V)
Tp 57 11.86174 GHz (H)
Tp 58 11.88092 GHz (V)
Tp 59 11.90010 GHz (H)
Tp 60 11.91928 GHz (V)
Tp 61 11.93846 GHz (H)
Tp 62 11.95764 GHz (V)
Tp 63 11.97682 GHz (H)
Tp 64 11.99600 GHz (V)
Tp 65 12.01518 GHz (H)
Tp 66 12.03436 GHz (V)
Tp 67 12.05354 GHz (H)
Tp 68 12.07272 GHz (V)
Tp 69 12.09190 GHz (H)

HOT BIRD 3

Tp 70 12.11108 GHz (V)
Tp 71 12.13026 GHz (H)
Tp 72 12.14944 GHz (V)
Tp 73 12.16862 GHz (H)
Tp 74 12.18780 GHz (V)
Tp 75 12.20698 GHz (H)
Tp 76 12.22616 GHz (V)
Tp 77 12.24534 GHz (H)
Tp 78 12.26452 GHz (V)
Tp 79 12.28370 GHz (H)
Tp 80 12.30288 GHz (V)
Tp 81 12.32206 GHz (H)
Tp 82 12.34124 GHz (V)
Tp 83 12.36042 GHz (H)
Tp 84 12.37960 GHz (V)
Tp 85 12.39878 GHz (H)
Tp 86 12.41796 GHz (V)
Tp 87 12.43714 GHz (H)
Tp 88 12.46591 GHz (V)
Tp 89 12.47550 GHz (H)

FROM THE POST BAG

Mike Frey, G3VXZ, commented on the list of Satellites included in the last issue of "Satellite TV News" pointing out the omission of ZSSRD/Cosmos 2054 at 16.0 Deg W. In his Satellite Search column in "What Satellite TV" Roger Bunney provides regular reports of video from this spacecraft which carries pictures from the Russian MIR as it orbits the earth. Transponder frequencies are 10.810 GHz, 10.835 GHz and 10.380 GHz. The latter Tp is used for data only. Video is in Secam with Audio at 7.0 MHz. Polarisation is RHC.

From Blenheim New Zealand Paul Bruckel, ZL2ULN, writes to seek help in commissioning a second hand Andrews 3.0 M antenna acquired from the NZ Telecom. Paul says " I am in the process of designing and manufacturing (mainly from second hand bits off tractors and the like) a single-axis declinated mount which is claimed to have an accuracy of 0.005 degrees across the geostationary arc." Paul is keen to hear from any members who have any (or know where they can be found) surplus C/Ku band dual feeds and/or LNB's. Paul can be contacted at Rooksmoor, 1076B Waihopai Valley, RD6 Blenheim, New Zealand and has offered a photo of the finished result - it should look impressive !

Julian Vincent from Reading has written in asking for more information in "Satellite TV News" regarding sound and teletext/data services. This is very much of a growth area on satellite at the moment and I will try and reflect developments in forthcoming editions. Meanwhile Julian, thanks for the information included with your letter and see below regarding the launch of digital radio services on Astra later this summer.

SIRIUS 2

The Swedish Space Corporation, operators of Sirius at 5.2 Deg E, have announced plans for a further satellite to be known as Sirius 2. Sirius 2 is likely to be co-located with Sirius 1 and will have 32 Transponders providing both Nordic and European spot beams. Invitations to Tender have been issued to a number of manufacturers including Aerospatiale, Hughes and Martin Marietta.

WHAT SIZE DISH ?

I hear many people discussing the size of antenna necessary to receive signals from one satellite or another. There are various computer programmes that will calculate this for you (i.e. SATPRO) but the following table reproduced from the excellent German "Infosat" magazine provides a very rough and ready guide.

Eirp Antenna size (ku band)		Eirp Antenna size (ku band)	
52 dBW	0.55 m	46 dBW	0.80 m
50 dBW	0.60 m	45 dBW	0.99 m
49 dBW	0.60 m	44 dBW	0.99 m
48 dBW	0.80 m	42 dBW	1.20 m
47 dBW	0.80 m	40 dBW	1.50 m

I am happy to provide an individual link analysis specifying dish size required for anybody who writes enclosing an SAE giving details of : Their Latitude/Longitude Satellites to be viewed, receiver threshold, IF bandwidth and their LNB noise figure.

Turksat 1B 42.0 Deg E

Kanal D has switched to the European beam and is located on 11.080 GHz (V). A new channel for Turks in Europe called Euroshow is expected to be occupying Tp 8 11.144 GHz (V) by the time you read this.

DFS 2 Kopernikus 28.5 Deg E.

The new Hungarian music channel TOP-TV launched in early June on 12.591 GHz (V) initially in clear PAL but subsequently moving to a variant of the Nokia LS256 line shuffling encryption system. Cable Plus has now transferred from Eutelsat 1 F5 to Tp AI 11.475 GHz (H) in clear PAL. Audio is at 6.65 Mhz. The Czech Premiera TV has commenced its service on 11.525 GHz (H) in clear PAL although it is expected to Encrypt in either Videocrypt II or Nokia LS256 during, late summer. The Belgian channel VT4 on 11.525 Ghz (H) is now encrypted in Cryptovision.

Eutelsat 1 F4 (inclined orbit)

FilmNet Greece is now using 11.095 Ghz (H) in Pal using the original SATBOX encryption system. Old Filmnet decoders for the original Astra service will decode the channel.

DFS 3 Kopernikus 23.5 Deg E.

Nickleodeon (Germany) can now be found on 11.625 GHz (H) in clear PAL with audio at 6.65 Mhz and 7.02/7.20 Mhz.

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

The Disney Channel is due to launch on October 1st. No Tp details are yet available. TV3 Norway looks set to close down on Tp 31 in favour of a DTH home shopping channel called TV Shop Europe. TV3 Norway will then only broadcast from Intelsat 702 at 1.0 Deg W. The new Playboy Channel looks set to launch in the Autumn. The Adult Channel will move to Astra 1 D Tp 63 sharing with FilmNet Central Europe to allow the Playboy Channel to take the night hours on Tp 42 of Astra 1C. The Dutch Veronica 6 general entertainment channel looks set to launch on 1st September on Astra 1D Tp 51 10743 Ghz (H). As with RTL 4/5 Veronica 6 will be partly encrypted in Luxcrypt. A new German channel called Classical TV will launch on Astra 1D Tp 56 this month during the International Radio Exhibition in Berlin. The channel will screen "classic" films, series and classical music. TVX is now occupying the night hours of Tp 34 of Astra 1C in PAL using Videocrypt 1. The German shopping channel HOME ORDER TV (HOT TV) will take Tp 61 10.981 GHz (H) on Astra 1D using clear PAL.

Eutelsat 11 F3 16.0 Deg E.

The Music Factory channel, intended for Dutch cable networks is now resident on Tp 41 12.559 GHz (H) in clear Pal. The channel is on 24 hrs a day following the move of its sister channel TV10 Gold to Orion Fl. Both these channels will move to MPEG 2 delivery using Philips encoders before Christmas. TV Erotica is now to be found on both Tp 22 11.163 GHz (H) and Tp 37 11.575 GHz (V). Tp 37 uses the Eutelsat Widebeam (47 dbW at beam centre) to extend the geographical reach of the channel. Transmissions are in D2Mac Eurocrypt S2. The Italian Satisfaction Club Television is now carried for 2 hrs per night on Tp 22 using Nokia LS256 encryption system. DTH decoders are on sale through various European outlets. The French Rendezvous channel has announced a September 1st launch in D2Mac Eurocrypt S2 on Tp 20 10.987 GHz (H). A new Polish channel called PKT has signed an uplink contract with BT. The launch is planned for late summer. Look out for Arab Radio Television, ART, (currently using capacity on ARABSAT 1 D) taking TGRT's Tp 26 11.095 GHz (V).

Eutelsat 11 F1 13.0 Deg E.

As predicted at the beginning of the year Viva 2 has now replaced Eurosport on Tp 20L 10.972 GHz (H) in clear Pal. ARTE was due to take Tp 26 11.080 (V) following the move of TV5 to Hot Bird 1. The German sports channel DSF may take Tp 34L 11.638 GHz (H) following closure of Emirates Dubai TV on this Tp.

Eutelsat 11 F6 (Hot Bird 1) 13.0 Deg E

The French music service MCM commenced its operation on Hot Bird 1 in clear PAL with a promise of moving to PAL PLUS within a short time. It is not yet clear which encryption system MCM will use however initial reports suggested Videocrypt 2 as a possibility. The German women's channel Femme TV will now take Tp 7 11.345 GHz (H) using clear PAL replacing the Czech Premiera TV which folded through lack of finance. Femme TV will broadcast for 12 hours a day closing at 12.0pm. A formal launch was mooted for August although testing was expected to be taking place well beforehand. The Sci-Fi Channel have announced their launch date for cable networks as 5th October on Tp 4 11.283 GHz (V). The Sci-Fi Channel plans to encrypt the service but have so far not revealed details of the system to be employed.

Eutelsat II F2 10.0 Deg E.

The Slovak channel VTV based in Bratislava is now occupying Tp 25 10.972 GHz (V) (Formerly RAI UNO). TGRT has now left Eutelsat II F3 and can be found on Tp 26 11.095 GHz (V) (formerly RAI DUE). Worldnet has now moved from Eutelsat IIF2 to Tp 37 11.575 GHz (V) in clear PAL.

TV SAT 2 0.6 Deg W

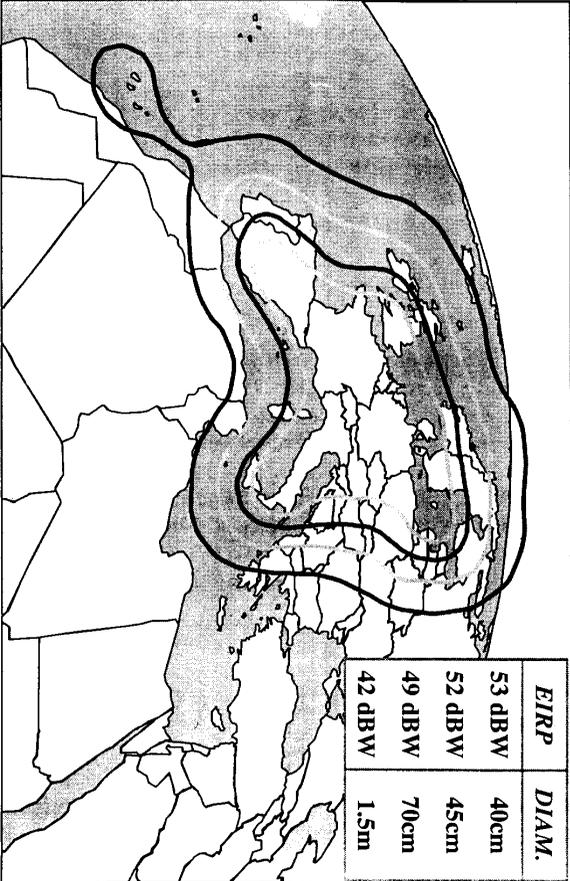
The frequency plan for TV SAT2 at its new location is as follows;

Tp	Freq(GHz)	Pol	Video	Service
2	11.747	LHC	D2Mac	TV6 Denmark
4	11.823	LHC	D2Mac	TV Plus
10	11.900	LHC	D2Mac	SVT 1
14	11.977	LHC	D2Mac	Z-TV Denmark
18	12.054	LHC	DMac	SVT 2

Plans to encrypt TV6 and Z-TV in Eurocrypt S2 have apparently been shelved until September 1st.



HOT BIRD 283 SUPERBEAM COVERAGE



Telecom 2B 5.0 Deg W.

The French Weather channel LA CHAINE METEO is sharing Tele Monte Carlo's Tp at 12.648 GHz (V) in clear Secam with audio at 5.80 MHz and operates between 0500 am and 0800 PM. The channel will join the Canal Plus digital package on Astra later in the year.

TDF 1/2 19 Deg W.

Still located at this spot TDF seems to have been given a new lease of life with Cine Cinemas being relocated here from Telecom 2B at 5.0 Deg W. Cine Cinemas can be found on 11.881 GHz (RHCP) in D2Mac Eurocrypt. Canal France Internationale, also in D2Mac Eurocrypt is now on 11.958 GHz (RHCP). MCM closed down its TDF service in June following its transfer to Hot Bird 1.

Orion F1 37.5 Deg W

The Dutch TV 10 Gold channel moved here shortly after its launch from a shared transponder with The Music Factory on Eutelsat 11 F3 to the upper half of Tp 14 11.492 GHz (H). The service is intended for Dutch cable networks and uses PAL with simple video inversion. A feed of the German VH1 service has been carried on the lower half of Tp 14 on 11.469 GHz (H) in clear PAL with audio at 6.6 MHz. Originating from New York, ASIANET TV can be found in clear PAL on 11.620 GHz (H). All these signals are P5 on my 1.5M antenna. Numerous feeds are to be found now on this satellite. Check; Tp 2 12.585 GHz (V), Tp 3 12.665 GHz (V), Tp 7 11.617 GHz (V), Tp 11 12.645 GHz (H), Tp 16 11.595 GHz (H).

CABLE & SATELLITE'95

ASTRA Digital Radio

The London Cable & Satellite Exhibition was the venue for the launch of the new ASTRA DIGITAL RADIO system (ADR). ADR is a digital transmission system using existing Astra audio subcarriers. There are a maximum of 12 digital subcarriers per transponder providing either 12 stereo or 24 mono channels.

The source coding for the new service is compliant with international standards (MPEG-1 layer II, Musicam). Each digital subcarrier is spaced @ 180 KHz and uses QPSK modulation. The audio data rate is 192 kbit/s with a sampling frequency of 48 KHz. The frequency range of the resultant audio channel is 20 Hz-20 KHz with a dynamic range of >90.0 dB.

ADR receivers will initially be stand alone units before manufacturers integrate ADR functionality into new analogue and digital set top receivers. The stand alone units can either be used in a loop through configuration from the LNB or use a separate feed from a dual LNB. Obviously in the loop through mode the ADR unit and satellite receiver can not be used simultaneously as one or other of the receivers will take control of the voltage switched polarity of the LNB.

Reproduction is compared to CD quality and an ancillary data channel permits transmission of RDS information. ADR receivers will incorporate a smart card for authorisation although it is likely that some services will be free to air. The first receivers are likely to appear towards the end of the year. One of the first service providers will be Digital Music Express (DMX) who intend to launch about now using B-Sky-B for their subscriber management. German manufacturers Kathrein and Technisat look likely to offer stand alone receivers in the market place first.

DIGITAL TELEVISION

In the UK it looks like the introduction of a satellite delivered digital service will not occur until 1996 with the launch by Sky of a Pay Per View (PPV) movie service. Sky then plan to launch a 120 channel digital service in 1997 with movie services being multiplexed at 20 minute intervals over a range of timeslots (channels).

Several of the top manufacturers including PACE, Grundig, Nokia and Sagem were demonstrating new Digital DTH receivers at the Cable & Satellite show. In nearly all cases however the receivers were still pre-production models with no date for availability in the UK domestic market. The following notes provide a short pen picture of what the new PACE receiver will offer.

PACE DVR500

Pace were showing off their new DVR500 MPEG 2 Integrated Receiver Decoder using a downlink from Astra 1D employing 4:1 compression. The receiver is fully MPEG2/DVB compliant providing a resolution of 720x576. Audio is MPEG/DVB Musicam providing CD quality stereo sound (18 bit precision delta-sigma DACS). Other features include; a colour graphics user interface, video mosaic facility allowing simultaneous reception of different services, video wall facility allowing the user to choose from multiple camera angles, electronic programme guide allowing automatic tuning to pre-set services, RS232 serial port, optional internal modem and a high speed digital port (up to 50 Mbit/s) allowing downloading of software.

A simple block schematic of a digital DTH receiver is reproduced opposite.

Universal LNB's

Much in evidence on the stands of LNB manufacturers such as Continental Microwave and Grundig were the new "Universal" LNB's. Specifically designed to meet a performance specification laid down by SES these LNB's allow reception of all Ku band frequencies. The units operate in two bands - low, 10.7 to 11.7 GHz and high, 11.7 to 12.75 GHz. Band switching is effected by a 22 KHz tone from the receiver. Switching between horizontal and vertical polarities is by the conventional 13/17V change.

TECHNOLOGY UPDATE

The digital media division of Hyundai has unveiled its HDM821 1M SAVI MPEG2 decoder. SAVI stands for System, Audio, Video and the Hyundai chip is claimed as the first fully integrated MPEG 2 device. Most MPEG 2 solutions are designed around three or four separate chips. The HDM821 1 M can process and synchronise audio and video together whilst adding a graphics overlay and is aimed primarily at digital set receivers. The HDM8211M is sold in a 208 pin MQUAD package, requires a single 5V power supply, 50 MHz clock, and consumes only 2 watts of power.



HOT BIRD 2&3 WIDEBEAM COVERAGE



A single-chip 64/256 QAM Quadrature downconverter, equaliser & demodulator (QED) has been jointly developed by Applied Signal Technology and VLSI Technology Inc. This type of device will be a key component in the production of cost effective digital set top receivers.

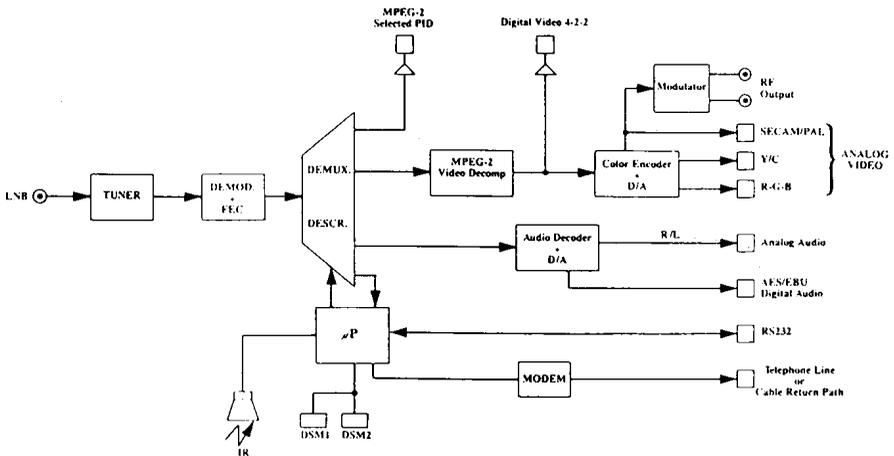
Manufacturers involved in MPEG 2 decoder chip production include C-Cube, AT&T, IBM, Texas Instrument and Motorola.

CONCLUSION

Well that's it again for this edition of Satellite TV News. In the next issue we should be able to reflect the first launch of digital services in Europe, there will be details of a new stand alone combined Eurocrypt/Videocrypt decoder from Germany and as usual all the news on new channels and satellite launches.

Please send all correspondence for this column to:

*Paul Holland, 'Chatterton, Chapel Lane Threapwood, Nr. Malpas, Cheshire,
SY14 7AX*



TRANSMITTING LNB's

By Peter Johnson G4LXC

CQ-TV 170 Contained the first part on transmitting LNB's. This is the second part and relates to direct modulation of the DRO puck oscillator.

The LNB referred to was the Amstrad Blue cap LNB which I understood was designed by Marconi and produced by a separate company.

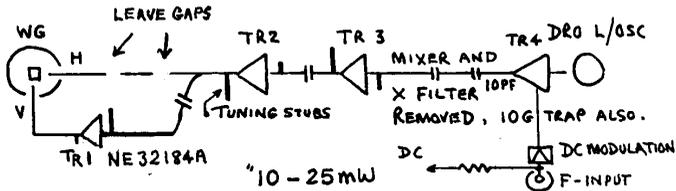
Part two is about the modifications to provide direct modulation of the DRO puck oscillator and direct amplification to a level of 25mW.

Most other types of LNB's are quite able to be modified in the way described here. The final TX & RX system is combined onto one dish feed by the use of a horizontal & vertical combiner type feed which may be rotated through 90 degrees to match any polarity. **Provided the RX is switched off before the TX is switched on and Vice Versa.**

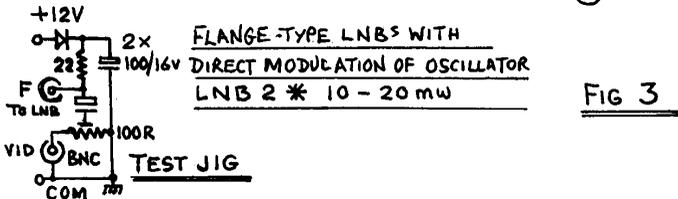
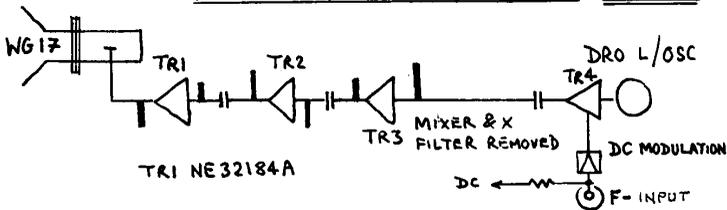
The Uniden LNB provides about 20mW, with three stages of amplification, with its own transistors turned around. The Skyscan receive LNB shown in the photo is modified to receive the 3cm ATV band. Please note that most standard LNB's are able to be changed by replacement of the DRO puck with a 9.1 GHz type.

Figure 7 shows the general arrangements of a TX & RX system. Figure 1 shows a general block diagram of the Amstrad LNB and how the re-arrangement of the circuit is made, see figure 3 and figure 10 for the Uniden.

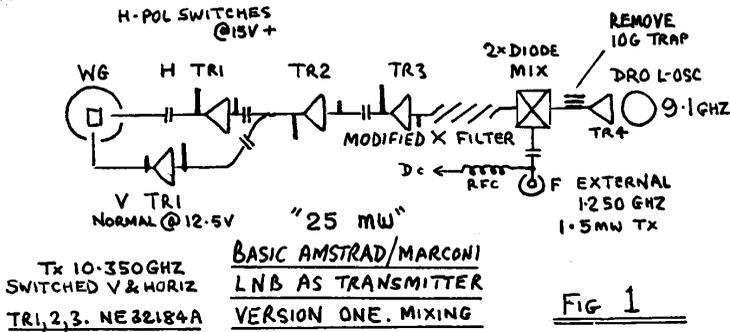
Static is death to GaAs Fets!!! Please take care to use the recommended earth system, earth yourself to the LNB with a wrist strap. Earth the LNB to a common mains earth on your bench, earth your bench vice and the DC power supply used to test the LNB. Your soldering iron must be earthed to mains earth, which must be a common earth to your bench earth point. **Never work on your LNB without static protection.**



LNB 1. BASIC AMSTRAD/MARCONI LNB
VERSION TWO, DIRECT MODULATED-OSC FIG 2



FLANGE-TYPE LNB'S WITH
DIRECT MODULATION OF OSCILLATOR
LNB 2 * 10 - 20 mW FIG 3



BASIC AMSTRAD/MARCONI
LNB AS TRANSMITTER
VERSION ONE, MIXING FIG 1

Tx 10-350GHZ
 SWITCHED V & HORIZ
 TR1,2,3. NE32184A

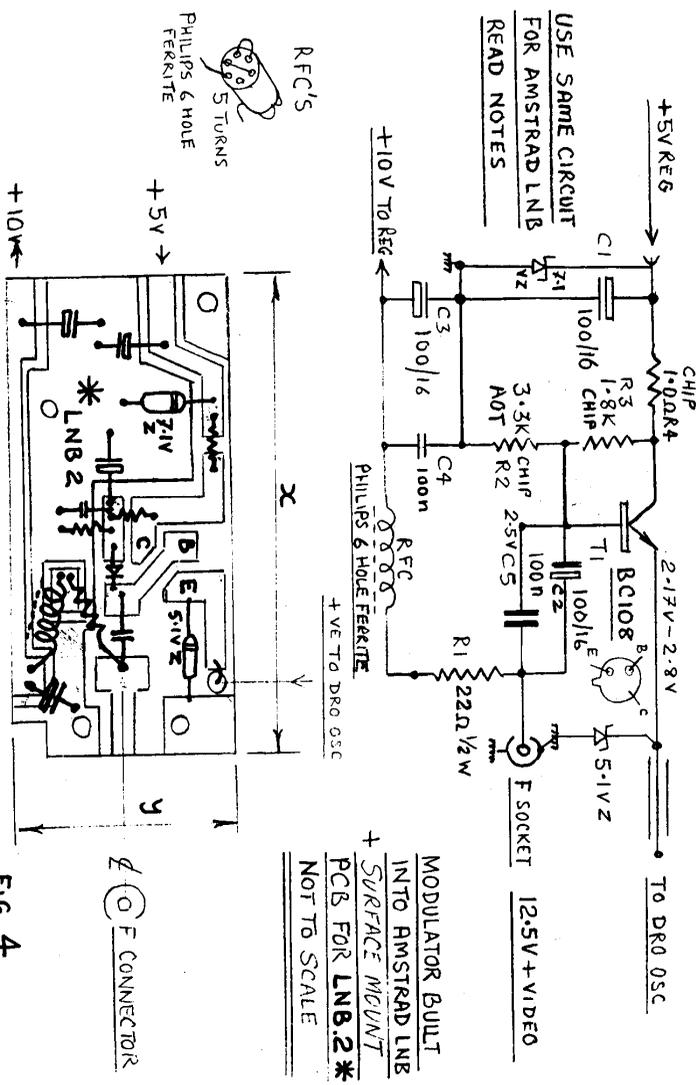


FIG 4

F CONNECTOR

AMSTRAD LNB

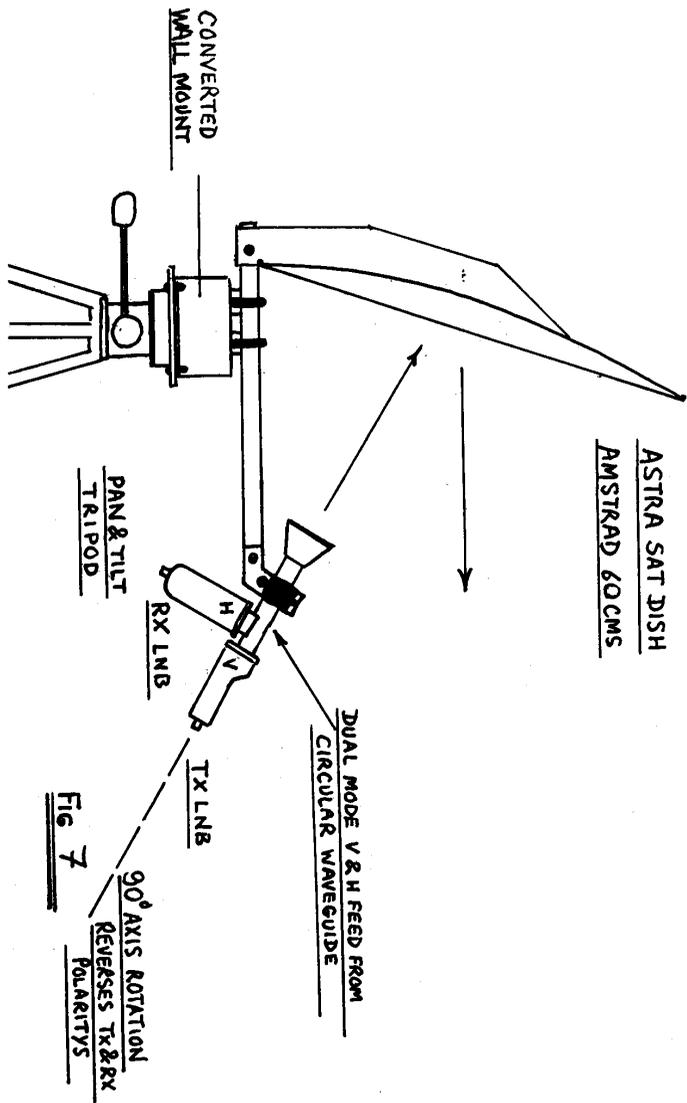
Place firmly in your bench vice.

1. Drill out the four rivets holding the cover on, remove the cover. With the use of a star key, remove the die-cast shell covering the PCB. Inspect the PCB for water damage, the PCB should be clean, if not clean it with COLCLEAN and an old toothbrush. Also, you may need to use a fibreglass retractable pen eraser, this is used to clean the PCB tracks to a bright finish, this will allow the tracks to accept new solder more readily.

2. Make up the test rig, use it to apply 12 volts to the LNB. Check the voltage at the 5 volt regulator, and the 3.2 volt rail to the oscillator and RF stages. You will see there are pads on the supply side of each circuit to measure at (see figure 9). Have your 3cm RX standing by to look for the LNB local oscillator, tune around until you find a strong CW signal, wave your hand over the local oscillator to identify it. If you find it, you have got yourself a working LNB, Do not worry about the other RF stages yet. With a video signal connected to the test rig you should see some distorted modulation on the CW signal.

3. Remove DC volts from the test rig. Proceed to remove TRI V, TRI H, TR2 & TR3 plus the three IF amplifier stages at the bottom left (see figure 9). Also some associated components to enable the use of redundant print pads. To remove transistors, first remove as much surplus solder as possible with a pump de-solder tool, or solder wick. To help in the removal of the transistors I made a small very sharp chisel out of a hacksaw blade about 2mm wide, combined with a 50 watt soldering iron to prise up the connections of the transistor from the PCB, one leg at a time. It's a hard task to get them off sometimes and great care is required not to damage the tracks, as the PCB is also made of very soft material.

Unwanted tracks can be peeled off and cut through with ease. New tracks may be fitted with a small amount of clear nail varnish. When dry solder the ends to the adjoining tracks, paper thin copper is cut on a metal or glass surface with a scalpel type knife. Do not use any other type of glue to fix copper onto the surface of the PCB.



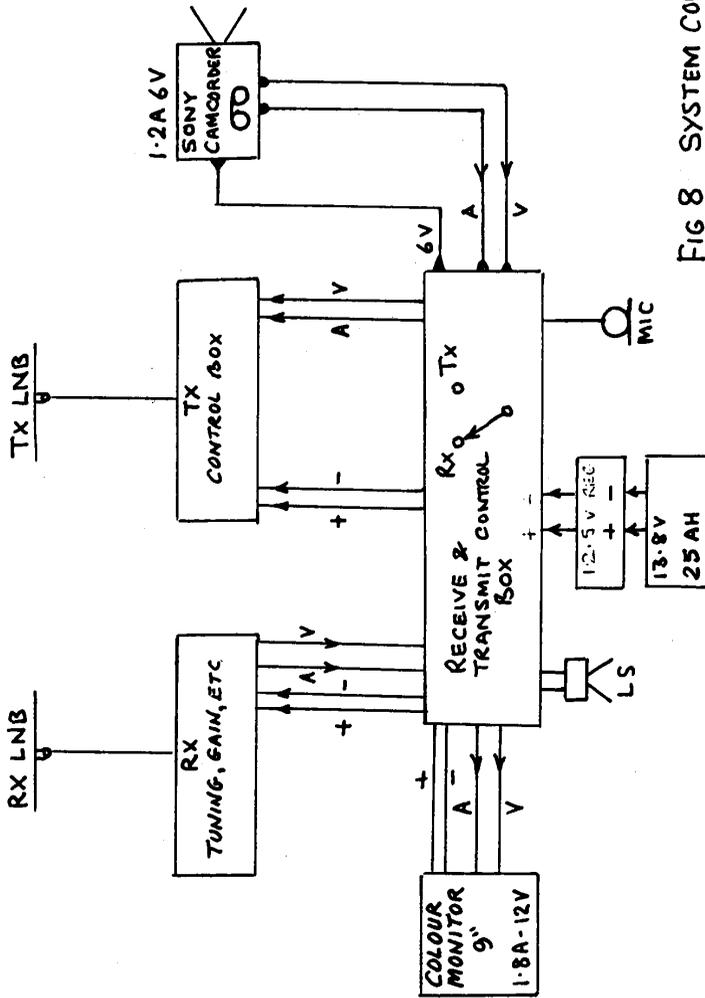
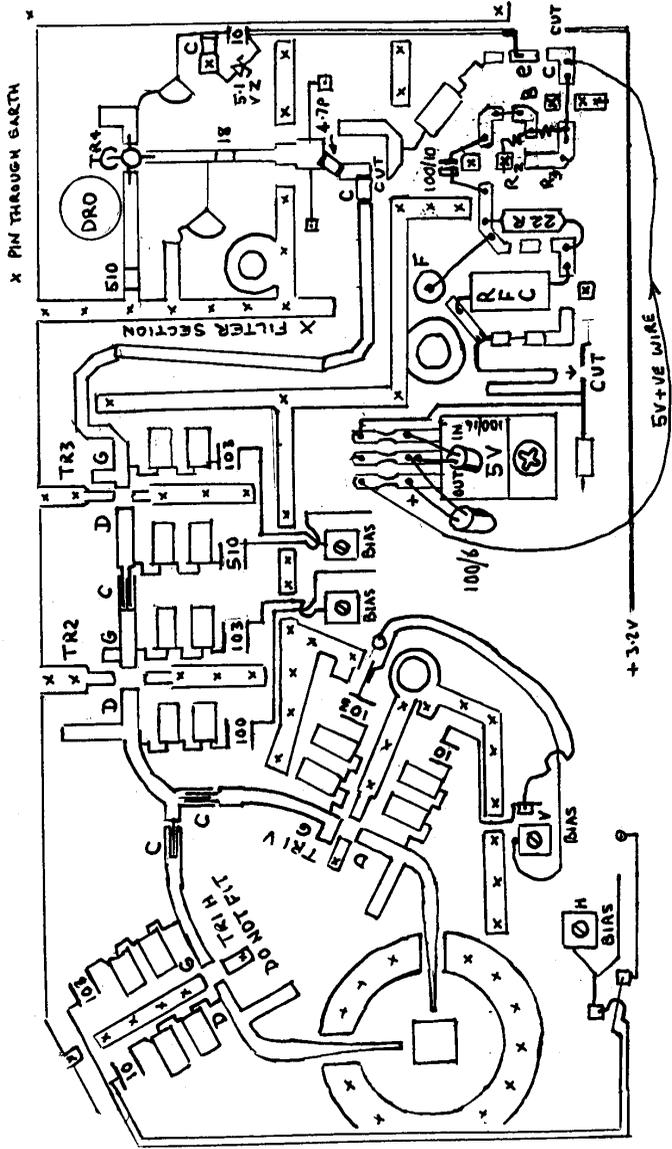


FIG 8 SYSTEM CONTROL

Fig 9 AMSTRAD BLUECAP LNB AS TRANSMITTER



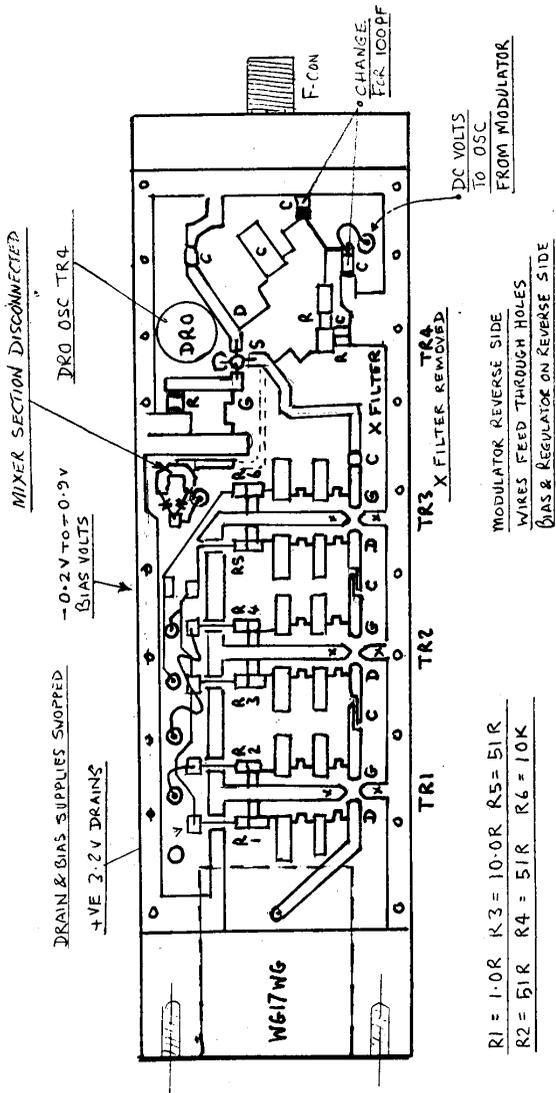


FIG 10 FLANGE WG17 TYPE LNB UNIDEN AS TRANSMITTER
NOTE AND OTHER TYPES OF FLANGE WG17 LNB'S

4. Assuming you have been successful in the removal of the components, start making the changes to the gate and drain connections, don't forget to swap and change the values of the resistors in the gate and drain supplies (See figures 4 & 9). Remove the X filter and replace with a strip of foil the same width as the 50 ohm lines (about 1.8mm wide). Remove the mixer diodes and cut the mixer track as shown. Fit the 4.7pF capacitor and the 5.1v zener diode. Build the modulation circuit onto the PCB as shown in figure 9. Check your work in detail, do not fit TRI, TR2 or TR3 yet. With a video input to the test rig, switch on the 12 volts and look for the signal. You should be able to see low definition pictures on your receiver, when you do so it's time to fit the RF stages. Try the first two stages with a chip capacitor in the final stage TRI H. A very strong signal should be present, if all is going well fit the final transistor TRI V. Remove the chip capacitor at TRI H. Replace the die-cast shell with 3 or 4 screws and check the power output. To increase the power out additional copper foils need to be added to the striplines, this can only be done if you have a suitable power meter, a diode detector as fitted to various gunn diode assemblies is quite a good indicator, and will show you any increase in power output relative to what you get. Proceed by setting the local oscillator to 10.250GHz, add the copper foils with the DC off (and the die-cast lid off), put the lid back on each time you test the power output. Also you need to adjust the bias to about -0.35 volts on each device. **Do be careful not to look into the waveguide when switched on.**

THE UNIDEN LNB

Much the same with the circuit details and methods employed. Strip the LNB down by removal of parts PCB's on both sides cut off the IF amplifier section, leaving the 5 volt regulator and negative voltage generator. The 10 volt regulator is removed with the IF section. How the vero PCB is placed and used as a surface mount board. Existing fixing holes are matched to this.

Figure 10 shows the general layout of these types of LNB's which have WG 17 flange. There are holes through the die-cast body, connections are made to the drain and gate supplies via them. Remove the mixer and X filter, re-route the output from the local oscillator to the first RF stage via isolating chip capacitor, 1pF or 4.7pF. Reverse the gate and drain circuits as required. Fit the transistors and put it all back together again with the modulator board. Check your work again before switching on.

The modulator and PSU circuit, figures 5 & 6. Sound on Sub-Carrier.

The S.O.S. PCB should be constructed onto a ground plane PCB layout, vero board is not to be recommended for this circuit as it becomes difficult to remove second and third harmonics of the CW f1, at 6MHz, ie. 12MHz, 18MHz, etc. The video circuit is OK for veroboard construction with care to keep input and output away from each other. L1 & L2 are MKANS K1731 Maplin 6MHz sound coils. L1 in the video circuit is 60 turns on 4mm diameter former, 36swg enamelled copper wire, with slug and can, and is tuned for maximum 4.43MHz colour subcarrier.

Consistent with the correct level at the receiver. RFC's are 6 hole Philips ferrites about 6mm long, wound tight with plain copper wire (inside turns) see figure 4.

Both types of LNB exhibit very good linear modulation, with a very healthy power output, and are extremely stable in frequency, over a wide temperature range, good value for your money! Experimentation is the art of achievement, so give it a try and GOOD LUCK.

The devices that replace the original transistors are available from Mainline Electronics and other traders attending rallies and cost about £5.00 each. If you can't use the originals.

More on DRO pucks

The following block diagrams show how to make use of currently available DRO's and their relationship with ATV bands both for TX & RX systems. The type numbers are written in as supplied by Oakbury components and Quantelec (01993 77 64 88) these are made in Germany and may be difficult to obtain as stocks are not being kept up by these company's.

A B = ATV Band cover = The range to be expected for use with a standard satellite receiver. The cost of the average DRO is about £12.50 inc. P & P (this is for OOPPM types). The dimensions shown are the diameter & depth of the DRO pucks. TX systems shown would be directly modulated oscillators followed by available types of RF amplifiers.

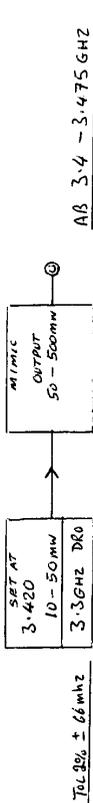
*If anyone has any feedback on these articles, please feel free to contact me on
01732 848512.. GALXC*

TX SYSTEMS



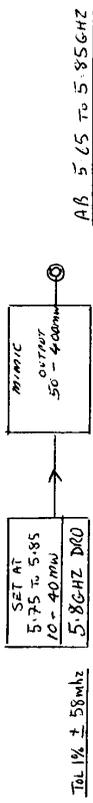
TYPE B 695-00-E2407

AB 2.310 - 2.45 GHz



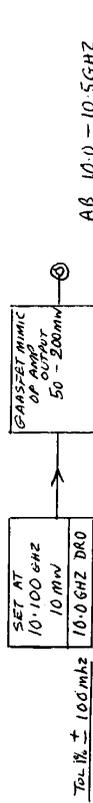
TYPE B 695-00-A 3307

AB 3.4 - 3.475 GHz



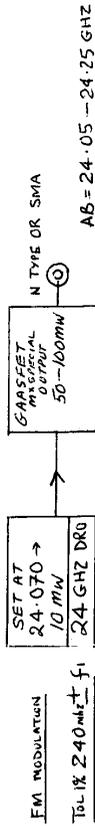
TYPE B 695-00-A 5807

AB 5.65 to 5.85 GHz



TYPE B 695-00-A 1003

AB 10.0 - 10.5 GHz



TYPE B 695-22-C 2408

AB = 24.05 - 24.25 GHz

GUNN DIODE ATV. TRANSMITTER KITS.

Gunmod 2 PCB. forms the heart of a compact, fully featured FM Gunn diode PAL. SECAM. or NTSC. ATV. transmitter with 5.5, 6.0 or 6.5MHz intercarrier sound. The PCB. is suitable for most types of 3CMs and other frequency Gunn oscillators up to 25mW. Equipped with a suitable antenna and RX. L.O.S. transmissions in excess of 100Km are to be expected. The single 3" by 2" quality PCB. incorporates a stable adjustable Gunn diode, modulator with video pre-emphasis and adjustable deviation, a stable intercarrier sound generator with selectable pre-emphasis, audio limiting, input level control and output filtering. The PCB. requires a single 10 - 15V DC unregulated supply and consumes only 20mA excluding the Gunn diode. This makes it ideal for portable or mast head use.

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

**PCB. kit with full instructions. You supply Gunn osc.
case, connectors ect. (Note 1) £20**

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

Prices are all inclusive.

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

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

For assembled and tested units, please contact.

Bob Platts G80ZP, 220 Rolleston Road, Burton upon Trent,
STAFFS. DE13 0AY

01283 531443 7pm to 9pm preferred
Please make cheques payable to Bob Platts

Coming soon. An ATV. tuneable IF/TVRO. 750 - 1750MHz. 12v DC operation
with built in switchable 13v - 17v LNB supply. tuneable sound. +/- video mod.
signal strength o/p ect.

WORTHING & DISTRICT VIDEO REPEATER GROUP

GB3VR & GB7VRB

1W FM-TV 24cm TRANSMITTER

This 1 watt transmitter generates its signal directly at the wanted frequency which can be set anywhere in the band, colour or BIW. On board intercarrier sound and fixed pre-emphasis are standard features. The kit includes the PCB, all on board components, pre-drilled heatsinks, an eddystone di-cast box and full and comprehensive instructions. Building time is three evenings work. The new price for this kit is **£70.00**. With over 550 units sold to the Amateur market alone, this is probably the biggest selling TX kit in the world.

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 has even more features 56 testcards, over 20 different wipes, even better

text control, including 30 screens of text messages, QRA calc, Testcard music, selectable displays, and now with a DTMF tone pad to control your repeater (including security tones if required). All test cards are over-scan ie the whole screen is used. Load in your own customised testcards (users your palette), Super Large Text, Silky smooth scrolling text, 24Hr

clock, callsign extensions, Hot key operation, Doc reader, ATV Cli, Cross Hatches, Purity, and

a comprehensive section for genlock users.

If you have an Amiga then this is the program for you, if you don't, go and buy one. This is a three disk set, the program, extra testcards, and the music disk. 1meg min required, state callsign and QRA (if known) when ordering. This program was £20.00 but now only **£15.00**.

The Spectrum ATV Program.

Still selling after all these years, this 48k version has over 60 commands which include 7 testcards, memo pad, clock, maps, tones, locator calc (old & new), UK flag, X-Hatch, various size text printing plus disk transfer command and more. Now only **£5.00**.

We still have a few add-ons for the cropready test card generator, phone for details. The new AGC kit will be out shortly, unless anyone knows of a supply of AN302's at a sensible price.

ORDERS SHOULD BE SENT TO

Treasurer of GB3VR, R.Stephens G8XEU, 21 St James Ave., Lancing, Sussex, BN15 0NN, UK.

Telephone (01903) 765760 7 to 8 pm. Cheques payable to: "W&DVRG"

DX-TV RECEIVER SYSTEM

• Variable vision IF bandwidth

• Multi-system sound



NEW 'SUPER-X' MODEL NOW AVAILABLE. SEND SAE FOR MORE TECHNICAL INFO NOW!

'COMMUNICATION-STYLE' TV DX-ING

The D-100 DX-TV Receiver System provides a versatile approach to long-distance TV reception or for general-purpose sound monitoring.

There are two outputs - one feeds a TV at channel 65 for vision, while another feeds an FM radio for sound. By simply switching the sound to the picture, multi-system reception is achieved, without the need for a special TV set. These are some of its features:-

- * VARIABLE VISION I.F. BANDWIDTH
- * VARIABLE MULTI-SYSTEM SOUND
- * AUTO BANDSCAN/PREVIEW
- * NORMAL OR EXTENDED BAND RANGES
- * AUTO VISION I.F. BANDWIDTH FACILITY
- * CONNECTIONS FOR RF ANALYSER CIRCUITRY
- * DC INPUT: 14.5-24V
- * SUITABLE FOR ALL TYPES OF PROPAGATION
 - Sporadic-E, TROPO, F2, TRP, etc.

VISION I.F. BANDWIDTH REDUCTION

Essential for 'serious' DX-ing, a reduced vision I.F. bandwidth lifts the reception threshold thus helping to recover weak signals normally lost in the noise when using an 'up converter' or multi-system TV with its inherently wide-bandwidth I.F. stages. Bandwidth reduction improves selectivity too, thus assisting adjacent channel reception, particularly in Bands I and III where interleaved channel allocations exist.

PRICES: UK inc. P&P: £138.95
EC via Airmail: £143.95
OUTSIDE EUROPE: £153.95
(Overseas payment by Eurocheque or Bank Draft)

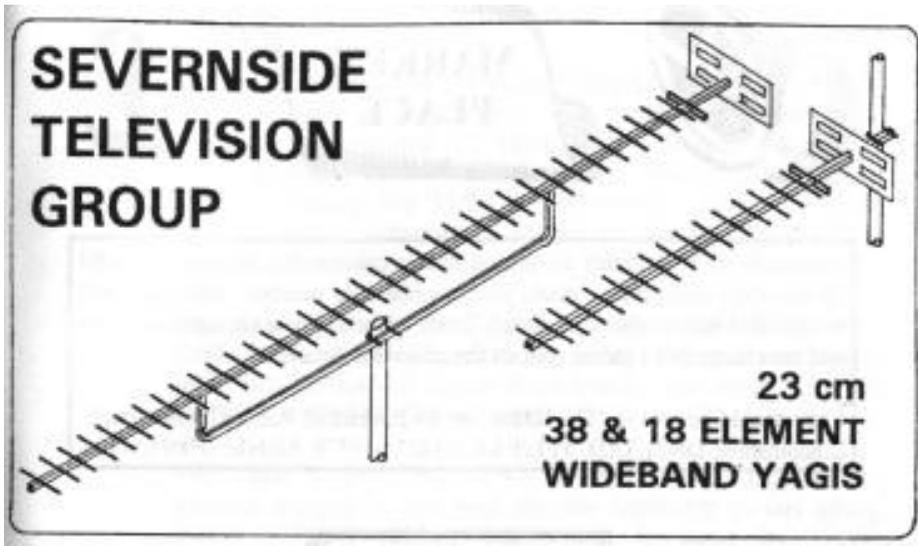
AERIALS FOR DX-ING

We can supply specialised Band I/II systems from the dipole to 5-element beams for Sporadic-E DX-ing. Also, combination arrays for Bands I, II & III are available.

OUR LATEST CATALOGUE IS NOW AVAILABLE AT ONLY £0.75p*
FEATURING A RANGE OF PRODUCTS AND PUBLICATIONS
UNIQUE TO OUR COMPANY

* Refundable with 1st order
Personal callers by prior arrangement only please.

HS PUBLICATIONS
7 EPPING CLOSE, DERBY DE22 4HR, ENGLAND
TEL: 01332 38 16 99



All of our 23 cm Aerials are specifically designed for ATV use - although they can be used for other modes as well. Wideband characteristics mean that you need only one aerial to cover the repeater input and output channels. Our famous wideband yagis come fully assembled in two versions :

38 ELEMENT HIGH GAIN : 14 dB gain, 1.8 m long, £26.00 plus postage.

18 ELEMENT STANDARD : 10 dB gain, 0.9 m long, £15.00 plus postage.

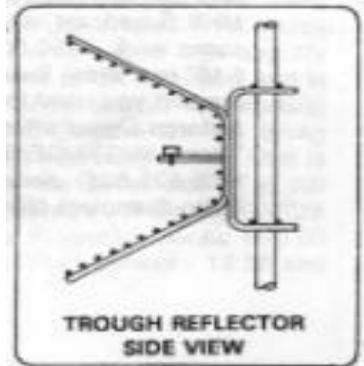
Don't forget our **20 ELEMENT CONVERSION KIT**, which converts your existing 18 element aerial to the full 38 element high gain specification : £13.00 plus postage.

Our 23 cm **TROUGH REFLECTOR** is quite unique, combining 11 dB gain with wide bandwidth and wide beamwidth. It's also compact, just 0.55 m high, 0.35 m wide and 0.3 m deep. Supplied as a kit of predrilled and preformed parts, for easy "screwdriver" assembly : £19.00 plus postage.

All aerials feature an SWR of less than 1.5:1 and are supplied with mast clamps suitable for masts up to 55 mm diameter. Mast poles shown are not supplied.

POSTAGE : £3.75 for one aerial, £5.00 for two or more. Telephone orders with cash on delivery : £2.75 supplement per order. Orders from outside of the UK - please write for carriage quotation.

CHEQUES payable to "SEVERNSIDE TELEVISION GROUP" and send to 18, Linnet Close, Patchway, Bristol BS12 5RN. Telephone (evenings & weekends only please) 0117 969 8136. Please allow 28 days for delivery.





VHF COMMUNICATIONS

VHF COMMUNICATIONS magazine is published quarterly and is available from KM Publications, 5 Ware Orchard, Barby, Nr.Rugby, CV23 8UF, U.K.

Tel: (0)1788 890365; Fax: (0)1788 891833.

Email: 100441.377@compuserve.com

The yearly subscription is **£15.00** 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 VHF Communications. Payment made also be made by any major credit card at **£15.75**. The subscription includes surface mail charges, air mail is extra at **£6.00** per year (**£6.30** 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 constructional articles for equipment operating in these bands.



Photograph by Rodney Harrison I.R.I.P.P.

BACK ISSUES ... £4.00 each: £14.00 per YEAR VOLUME

BINDERS TO HOLD 12 ISSUES £5.50

COMPLETE INDEX 1970 - 1994 £2.75



Non trade advertisements are placed in this column free of charge to paid up members only, please quote your membership number. Addresses will be included unless otherwise stated. Trade adverts appear on separate pages and are chargeable - please contact the editor for details.

Copy should be sent to 'The Editor' at: 19 Ravendale Road, Gainsborough, Lincolnshire, DN21 1XD TEL/FAX: 01427 610578 Mobile: 0589 631104



For Sale: Marconi TF868B LCR Bridge £40. Elliot 8096 transistor curve tracer £30. PM 1038-NS201 RF Source module 2-18.5ghz £80. Airtech cavity filter (Big) tunes to 144mhz £50. ITT VCR Model VR240 £25. All above inspect & collect. Salvaged and erased EPROMS -2716, 2732 50p each, 2764, 27128, 27256 75p each. Many salvaged CPU and support chips available. Contact D. Hemingway G8EGG on 01428 604645.

For Sale: The following microwave modules are available for disposal: MTV 435 TV Transmitter, good condition £85. MMC 435/600 TV Receive converter, good condition £15. MMD 050/500 Frequency counter, good condition, reads up to 500mhz with instructions £40. Philips VHS -full size camcorder model VKR6800 complete with carry case, battery and charger, in good condition £250 o.n.o. Sony HVT 3000 film to video adapter, convert slides to video with your camera, complete with carriers and filters £35 o.n.o. Contact: John on 01253 594381

For Sale: Solent 24cm 1 Watt ATV transmitter. 24cm 20 Watt PA using Mitsubishi module, heatsink and fan. Grundig 12v colour camera. Philips V100 B&W camera, 240vac/12vdc including circuits. MM 70cm MTV435 ATV TX. MM 70cm transverter. JVL 24cm 28ele quadloop. 24cm Tonner. BBC B computer with floppy drive, eeprom programmer and video genlock. BATC I2C computer and teletext boards working as a repeater with DTMF decoder and teletext boards (I can reprogram my teletron repeater software for callsigns etc, as used at GB3EY)

10ghz tx with sound and receiver using Solfan heads. FT224 2M mobile with 144.750 xtals. 3 B&W monitors. All are in working order and can be demonstrated. Telephone 01482 448335 to discuss prices/availability. Andy Goy G4HJD

For Sale: Television books: Start a 'collectable' collection now whilst it's still affordable. 'ITV 1969'£5, 'ITV 1972'£4, 'ITV 1982' £3, 'BBC Handbook 1966' £5, 'Television behind the scenes' Newham 1947 £5, 'ITV Annual 1963' £3, 'TV Express annual 1962' £2, Many others, ask for list. All books in VGC, £1 extra postage per book. Contact: Dicky Howett on 01245 441811 or Fax on 01245 442816.

For Sale: Lo-Band U-Matic JVC editing suite comprising NV9240 recorder, NV9600 editor, NV-A960 remote controller. JVC KM-2000 colour effects generator/mixing desk. Equipment furniture available. FOR@ Time base corrector FA-410. Working 1" IVC 871P VTR with many spares. Most manuals available. Further details/serious offers please to Colin Stirling GM8M0I (QTHR). Buyer collects (Glasgow). Evening telephone 0141 632 9960

For Sale: Collectors item, Sinclair scientific calculator in good condition and original packaging, uses reverse polish notation system, £80 or would exchange for m-tec's BBC Basic(86) PLUS with documentation, a BBC emulator for PC's. Norman Smith Tel.. 01782 550684

For Sale: Robot 400 SSTV unit with green screen monitor VGC £150. Robot 300 SSTV, doesn't seem to be working! £75. Yaesu FRG7700 RX with FRT7700 ATU £235. Sanyo VMD3P camcorder with case, PSU, Cassettes, Battery, Manual, Been dropped, spares? offers please. Contact: Gordon Tew G8GZC (QTHR) on 01460 64376

For Sale: Softel SE 3010 teletext creating terminal, keyboard, twin disc drives, compact, excellent condition, ex BBC Ceefax, £100 o.n.o. Polaroid palette computer image recording system, EGA in 35mrn + Polaroid backs, IBM/Amiga software as new, boxed £250 o.n.o. Dalrota intelligent video controller TTL/RGB, all leads, as new £20 o.n.o. Sony NP1A battery chargers, as new, single way £50, 4 way £130 o.n.o. Contact: P. Bedford on 0181 747 0069

For Sale or Swap: COX 1222 Presentation mixer, working. Sopex 2D10 10MHz 'scope, working. IVC 9000 Spares scanner, audio head stack, tension modulator, capstan, vacuum collar. Marconi MK VIII Camera channel complete and working. Various spares for Link 110 cameras. Contact Patrick White G6CJB on 01628 21718

Sell or Exchange for test gear: Sanyo Betamax VTC M30 front loader, good condition. BBC B+ 128K computer and double disc drive, Saisho VCR VR1200HQ for spares (PSU fault). Hitachi colour video camera VK-C750. Any offers. Test gear wanted: audio millivoltmeter, Spectrum analyser covering 100K to 10mhz, LCR bridge or Q meter. Contact Mike Hutchings on 01794 340923 daytime or early evenings.

3cms LNB's. Converted LN13s. Several types available. All converted to 9-9.1 ghz local oscillator, re-aligned and fully tested. 1.2db noise figure £40. 1.6db £35. 2.0db £30. Your LNB converted to 3cms. Marconi blue, black, white cap LNBs converted for Astra 1D (10.7ghz) operation. C band LNBs converted for 9cms operation. Contact Bob Platts G8OZP for details on 01283 531443 7pm to 9pm preferred, or write to 220 Rolleston Road, Burton upon Trent, Staffs. DE13 OAY.

FOR SALE: I've got to make some space here so I'm reluctantly parting with three very collectable valve-era picture monitors.

Marconi 14" 625/405 (on 625 at the moment, mid-1960s), Marconi 8" 625/405 (on 405 at the moment, mid-1960s), Peto-Scott 8" 405-only (c.1960). All three have been well cared for and work well; they come with circuits and my guarantee.

30 each or deal for all three.

Lenses: selection of Vidital and Vidiac lenses (1.5" mount, not C-mount) surplus to requirements at bargain prices: enquire. Andy Emmerson G8PTH, 71 Falcutt Way, Northampton, NN2 8PH. 01604-844130.

FOR SALE: Old but viable Sony U-Matic equipment, cheap. VP1210 player, VO-2631 recorder, VO-3800 portable recorder (with charger, two batteries, JVC-type camera cable). Electro-Craft VM-FX colour video mixer and effects generator with PAL coder, genlock, caption colouriser. Plus loads of cables and plugs. Offers?

Terry Glenn, Bromley, Kent. 0181-464 2311.



Wanted: Any information for JVC KY2000B camera, I.E. Circuit, connections, etc. Also camera cable to allow connection to 10 pin VTR input socket and studio viewfinder + CCU ? Any information on Televes synth UHF modulator model 5850. Information on Augat Broadband amplifier LWB331B believed to be 50-700mhz amplifier ? All expenses reimbursed, can copy & return any manuals, etc. Ray Hill G0IMV on 01989 769209

Wanted: Oscillator valve and schematic for Marconi 1066/1 signal generator and two Philips U321 TV Tuners. Contact: Jack Troup WA6JYU at: 15 Rica Vista, Novato, CA 94947, USA.

Wanted: J. L. Baird letters, etc and (broken) P210 Walkie Talkies. Contact: P. Bedford on 0181 747 0069

Wanted: Cables for Paltex ES1 to VPR2B/MR2B plus any spares for ES1. JVC Camera cable to link KY2000B to RS2000 RCU. **Also Wanted, Circuits/Handbooks for:** Paltex ES1 edit controller. Aston video number generator VNG-2. Aston teletext decoder TD10 MK2. Ace PAL coder. Link 250 SGP. Link 251 SPG. Link 375 test inserter. Unitron ion TBC. Cox source ident 688. Seltech production timer 1238. Ikegami TA 79 Triax adapter. ITV Schools clock generator. Thames TV sports clock. Kikusui COS6100 'scope. Pyxis-p TBC/Mixer made by alta group. Contact Patrick White G6CJB on 01628 21718.

Wanted: Technical handbook for Marconi mobile waveform monitor type BD 810. Also Dallmeyer, Watson, Taylor Hobson lenses in any condition for turret I.O. cameras. Also required; American books, pamphlets, postcards, cookie jar labels and door mats dealing with the subject of (guess what) Television. Money waiting. Contact: Dicky Howett on 01245 441811 or write to: 23 Micawber Way, Chelmsford, Essex CM1 4UG

Wanted: Very old Philips televisions. Pre-war CRT of EMI (Marconi or HMV); chassis of Marconi 701 or similar; any pre-war television; cabinet for Ekco TA201; pre-war television brochures. I can collect. Information on a Philips experimental TV (with radio) type SG860A (c.1947-1948)? **OFFERED:** Help with documentation of Dutch (mainly Philips) Tvs from 1930's to approx. 1960; various tv-sets of 40's-50's; For postage costs: some TV tuners (continental standard) type Philips UV417. Jac Janssen PE1OCE, Hoge Ham 117D, NL-5104 JD DONGEN, The Netherlands. Tel (from UK, evenings) 010 31 1623 18158. Fax (please mark 'private') 010 31 1362 4664.

Wanted: Lens hood for EMI 2001 camera. Also any other unwanted parts for this camera range. Please contact Paul Gibbs on 01749 675839

Wanted: Service data for the following - IVC Time Base corrector (early 1970's Analogue) type 4103P. IVC 800 series VTR 801A, 825P & 871P Etc. Phillips pattern Gen, type PM 5508 - Panasonic Multistandard VHS VCR, type NV7000 EM - Panasonic Time lapse VTR type, NV 8030, NV 3160 (EIAJ colour) & NV 1020E. (Open reel 1/2" VTR's) Murphy 405 line valved vidicon camera & PSU (Circa 1962)- Philips VR2324, V2000 format VCR Ferguson TX10 series chassis including Text, & Stereo options etc. **Also Wanted, the following gear:-** National cartridge player & Hitachi cartridge player type SV 630 for spare parts - Akai 1/4" VT110 VTR & VT150 Colour VTR with good heads !! - Tube for Pye 842843 11" picture monitor, type M28 11W or equivalent (Complete Pye Mono monitors also required). - ex- broadcast colour monitors Pye, Philips, RBM etc. The older the better (Pal/RGB interface). - Tripod/pedestal for Marconi V322B vidicon camera. (Nothing to huge please!) - Ekco portable 405 line TV type, TMB 272 must be complete - Philips portable V2000 system VCR - Sony portable Betamax type, SLF1.- IVC 1" VTRs 800 & 900 series and Pal P colour cards for same. - Also IVC 1" Cartridge VTR type VCR 100 - Marconi Pattern gen type, B3742. If you can help with any of the above, or know of someone who can, please contact me at:- Terry Martini. 122B, Cannon Street Road, Shadwell, London E1 2LH - Tel: 0171 702 8774 (Home) or 0171 251 3196 (Workshop).

WANTED: Dallmeyer and Taylor Hobson C-mount lenses marked TV or Television Lens and without iris control. Andy Emmerson G8PTH 71 Falcutt Way, Northampton, NN2 8PH. 01604-844130.

WANTED: Service manuals for JVC KY1900 colour camera and/or RS1900 "ccu" and/or VF2500 viewfinder. Panasonic WJ-5500 8 channel SEG/Mixer/SPG. Printer/FDD port pinout on a Toshiba T3100 laptop (when switched to Floppy A or B), also any other info on this machine (or a handbook!) Any details on a "Teli" RDS encoder, type number 1/ZRZA 80101. Dave Hill G8MGP QTHR 01234 854388 or via BBS or Internet: dave@minnie.demon.co.uk

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

	COMPATIBLE VIDEO HEADS Highest Quality Components
IMPORTED AND DISTRIBUTED BY:	
Harrison Electronics	
LARGE RANGE AVAILABLE TO FIT MOST MODELS HIGH QUALITY AT COMPETITIVE PRICES WRITE OR PHONE FOR CATALOGUE	
CENTURY WAY, MARCH, CAMBS. PE15 8QW	
TEL: 01354 51289	FAX: 01354 51416



