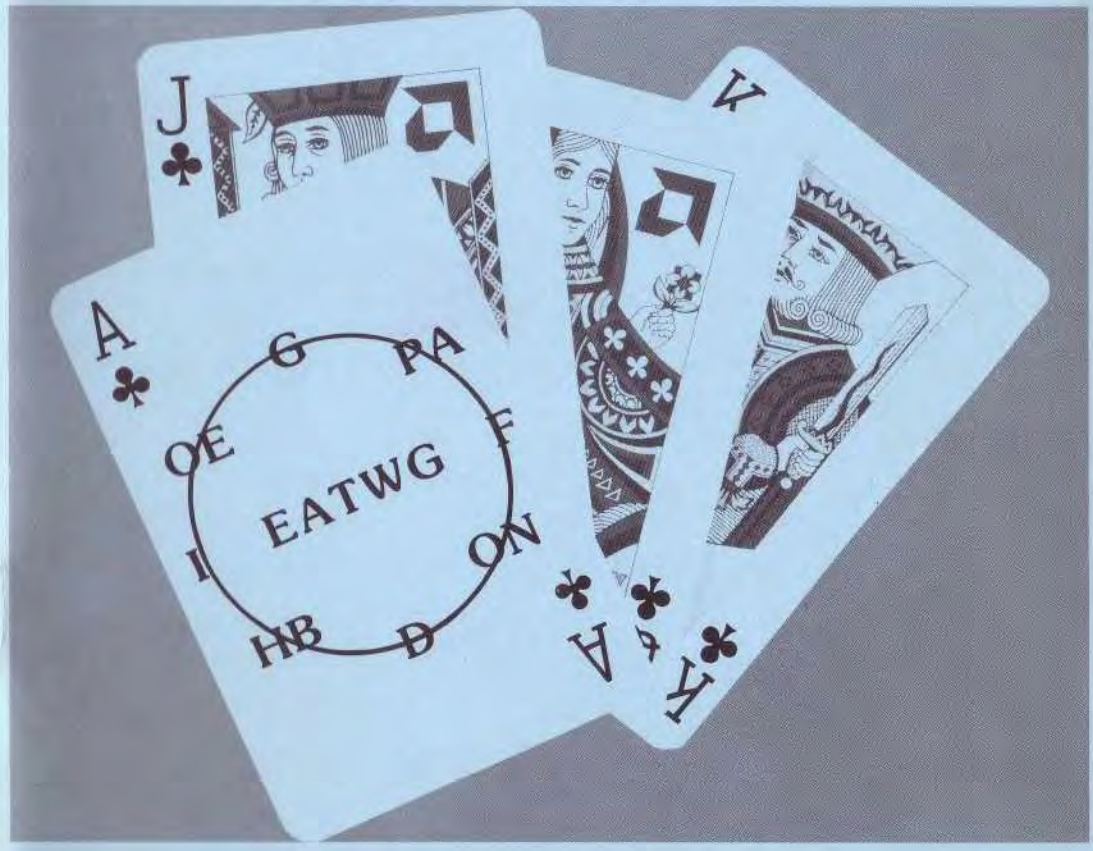
CQ-TV MAGAZINE No. 137

BRITISH AMATEUR TELEVISION CLUB

February 1987

A STRONG HAND .....



ATV gets international organisation in Europe

COMMITTEE

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TREVOR BROWN G8CJS - Secretary

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PETER DELANEY G8KZG - Member's Services

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JOHN WOOD G3YQC - CQ-TV Editor

MIKE WOODING G6IQM - CQ-TV Assistant Editor, Contests & Awards manager

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MEMBERSHIP

FULL YEAR: £6 or £1.50 for each remaining quarter of the year. All subscriptions fall due on the first of January. Membership application forms are available by sending a stamped addressed envelope to Dave Lawton, whose address may be found on page-2 of this magazine.

OVERSEAS MEMBERS are asked to send cheques bearing the name of the bankers London agent. Postage stamps are not acceptable as payment. Overseas airmail is extra - please enquire from Dave Lawton or see the rates list printed in the most recent 'November' issue of CQ-TV.

The British Amateur Television Club is affiliated to the Radio Society of Great Britain and has representatives on the committee of the European Amateur Television Working Group.

The BATC is registered under the DATA PROTECTION ACT, all queries to Dave Lawton.

CQ-TV is produced by the British Amateur Television Club as its official journal and is sent free to all members. It is not for general sale.

The BATC maintains many pages of news and information associated with amateur television on the Prestel Information Service. Club pages may be found within the ClubSpot section and full details were last published in CQ-TV 134. Copies of the article (two pages) may be obtained from the Publications department.

CONTENTS

CLOSE FOR PRESS DATE FOR THE MAY 1987 ISSUE.....7th March

WHO TO WRITE TO

Members of the BATC committee are available to help and advise club members on any ATV related subject. Remember that all such work is done in their spare time so please try to keep such queries to a minimum.

GENERAL CORRESPONDENCE - Club affairs; video tape library; technical queries, especially related to handbook projects: TREVOR BROWN G8CJS, 14 Stairfoot Close, Adel, Leeds 16. Tel: (0532) 670115

MEMBERS SERVICES - PCB's; components; camera tubes; accessories etc. (other than publications); queries related to such supplies: PETER DELANEY G8KZG, 6 East View Close, Wargrave, Berkshire RG10 8BJ. Tel: (07352) 23121

MEMBERSHIP - Anything to do with membership including new applications; queries and information about new and existing membership; change of address; non-receipt of CQ-TV; subscriptions; membership records; data protection; Prestel: DAVE LAWTON GOANO, 'Grenehurst', Pinewood Road, High Wycombe, Bucks HP12 4DD: Tel: (0494) 28899

LIBRARY - Any queries relating to the borrowing or donation of written material to the BATC central library. PAUL MARSHALL G8MJW, Fern House, Church Road, Harby, Nottinghamshire NG23 7ED: Tel: (0522) 703348

PUBLICATIONS - Anything related to the supply of BATC publications. CQ-TV back issues and other publications are normally only available if listed on the Publications order form at the centre of this issue: IAN PAWSON G8IQU, 14 Lilac Avenue, Leicester LE5 1FN. Tel: (0533) 769425

EXHIBITIONS AND RALLIES - Also arrangements and information about lectures and talks to clubs; demonstrations etc: SITUATIONS VACANT - any volunteers are asked to contact Trevor Brown.

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: (0525) 25343

CQ-TV MAGAZINE - Anything destined for publication in CQ-TV magazine (except regular columns) or forthcoming BATC publications. Articles; review items; advertisements; other material; queries on the content of past issues.
EDITOR: JOHN WOOD G3YQC, 47 Crick Road, Hillmorton, Rugby CV21 4DU. Tel: (0788) 69447 -
ASSISTANT EDITOR: MIKE WOODING (see next item).

CONTESTS & AWARDS, CQ-TV ASSISTANT EDITOR - Mike Wooding G6IQM, 5 Ware Orchard, Barby, Nr. Rugby CV23 8UF Tel: (0788) 890365.

Where possible it is better to telephone your query rather than write. Please do not call at unsocial hours. As a guide, try to call between 6.30 and 9.30pm evenings and not before 11am at weekends.

EDITORS POSTBAG

Dear Ed,

May I offer my two-cents worth to the 24cm repeater antenna polarisation discussion?

How about CIRCULAR polarisation to satisfy both camps? There is an interesting arrangement described on pages 54 and 55 of the IBA Technical Review No.23 "Developments in Aerials for Broadcasting".

The antenna described has a design dating from 1941 according to the references and does not seem to be difficult to fabricate.

Dave McQue, G4NJU.

(IBA Technical Reviews are available, free of charge, from: Engineering Information Service, IBA, Crawley Court, Winchester, Hants SO21 2QA. Please send around 35p in stamps to cover postage.
Anyone with more information on this subject might like to contact me - Ed)

Is that it? Does no one want to talk to me? everyone happy then? no complaints or suggestions? Ah well, on to the news:

NEWS ROUNDUP

SONY HVC & DIN PLUGS

Following the appearance in CQ-TV 136 of the article on the Sony HVC series camera remote control, G8KZG received an anonymous packet containing an 8-pin DIN plug. It seems that some 8-pin DIN plugs are made with all the pins at 45 degrees, whereas some have pin spacings of 41,45,45,45,45,41 degrees. The Pressac part numbers are MG/SP8 and MG/SP8-1 respectively, and both are available from STC Electronic Services. It is the latter that is required in this application.

Such plugs are used mainly by Japanese manufacturers and are often used to carry sync pulses. They are also available from Maplin Electronics.

PAID YOUR SUB's?

Members are reminded that 1987 BATC subscriptions were due on the first of January. If you have not yet renewed and wish to continue your membership, please send a remittance of £6 without delay to BATC, 'Grenehurst', Pinewood Road, High Wycombe, Bucks HP12 4DD. Members not renewing promptly will be deleted from club records and will receive no further copies of CQ-TV.

FREE GIFT NEXT TIME!

All members receiving the next issue of CQ-TV will also receive, absolutely free, a copy of the club's publication index.

This classified index lists all articles in CQ-TV for the last several years as well as those in the various BATC publications.

Of course, if you havn't renewed your subs, you won't get it, will you!

CQ-TV COPY

As you can see, copy for the magazine has been arriving at a healthy rate during the past few months. Please don't stop sending though, with 100 pages per issue I need lots. Almost anything is welcome, please phone (Editor) if you wish to discuss any ideas etc.

Just a reminder: a BBC micro and 'Wordwise' word processor is used for magazine text and page make-up. If you are able it does help very much if text could be sent to me which has been composed using similar equipment. I can also read 'View' files. Discs are preferred (40 track S/S although 80 track can be taken if necessary). cassette tapes are also acceptable. Of course tapes and discs will be returned promptly.

DC TO LIGHT

You will have noticed that advertisements for DC to Light products have ceased appearing in CQ-TV. Unfortunately the company is experiencing some problems and, as a result, there have been several outstanding claims against them. If any member of the BATC is experiencing difficulties and has not yet contacted me they are invited to do so, when I can offer some appropriate advice based on the situation at that time.

I'm sure we all hope that DC to Light weathers the storm and is again able to offer products on the amateur market in the future.

CROPREDY EPROMS

The Worthing ATV Repeater Group advise that the following EPROM's for the Cropredy test card generator design are currently available:

1. IBA monochrome style test card, with personalised callsign and caption message.
2. BATC style test card, with personalised callsign.
3. EBU style-1 test card, with personalised callsign and caption message.
4. EBU style-2 test card, with personalised callsign.
5. Contest numbers, 4 digits in extra large character size to fill screen.
6. Single digit (VERY large) - switch four of these to make sure of that elusive contest QSO.
7. Greyscales, with personalised callsign.
8. Crosshatch pattern
9. Text message in various formats.

The price is £5 for each EPROM which includes postage. A list giving more comprehensive information on the range is available upon receipt of a SAE from:
Geoff Mather, G8DHE, 72 Cranleigh Road, Worthing, West Sussex BN14 7QW. Tel: (0903) 32161

MORE ON 'F' PLUGS

G4JEC/WO says that the 'F' plugs sold by Tandy stores in the States DO in fact have a centre pin for soldering the coax conductor. Although not sure whether they are available from British Tandy shops, Chris has kindly sent us the part numbers:

Type F-59	(RG59/U cable)	278-211
Type F-56	(RG6/U, 'Aluminax')	278-214
Type CF-59	(RG59/U-long crimp)	278-222
Type CF-56	(RG6/U-long crimp)	278-223
Type F-59	(solderless push-on)	278-215

Thanks Chris.

PAL DECODER

Following the 'Can You Help' item on page 76 of the last issue, a number of members have been in touch who have similar problems about providing a RGB plus syncs output from a composite PAL colour signal. Our resident expert, John Goode, has come to the rescue again and has such a design under development. At the time of writing (just before Christmas) the first prototype has just been built. If tests and further prototypes prove satisfactory then the BATC intends to produce a PC board to be available from Members Services. All being well we hope to have the design ready in time for the next issue.

BRISTOL FM-TV GROUP AGM

Too late for inclusion in this issue comes details of the proposed ATV repeater for Bristol. This will be covered next time. However, there is just time to notify interested members of their AGM which is to take place on March 24th at 8pm. Doors open at 7.30 and the venue is the Elm Park Pavillion, Filton, Bristol where some of the new repeater hardware will be on display. Members and non-members will be welcome.

Further information from: Bryan Collins, G4YQR.

NEW TV REPEATER LICENCES ISSUED

November 1st 1986 was a great day for ATV repeaters; no less than four new licences were issued, they are:

GB3CT - Crawley, Sussex
GB3GT - Glasgow
GB3PV - Cambridgeshire
GB3VI - Hastings, Sussex

Two other repeaters: GB3AF (Newcastle) and GB3HV (High Wycombe) are both expected to receive licences at any time.

The site change (to Brighton) for GB3VR (formerly at Worthing) has at last been approved and it went back on the air on November 2nd, as did GB3CT. Group officials are asked please to keep CQ-TV magazine informed of their situation and progress.

MEMBERS SERVICES NEWS

In order to help our engravers, batches of callsign badges will be sent to them in future once per magazine cycle. Please ensure that your order reaches BATC Members Services by the CQ-TV close for press date, given in each issue. Badges will be distributed to members as soon as they have been engraved, but this can take several weeks.

The Members Services page in this issue has been re-arranged, so that all pcbs with a similar function are grouped together. Any special components for these projects are listed with their respective boards, which we hope will make ordering easier. There are some new items - a board to take 2 78-series regulators and 2 79-series regulators to make a useful power supply, and a board for the CQ-TV130 video processing amplifier. Re-introduced are 'C' camera lens mounts, which are being made specially for BATC. If you require a special 'C' mount, such as for a lens turret, please write to Members Services with a drawing of your requirements. Some other new boards are in preparation, and will be announced on the BATC Prestel pages, if you can't wait for the next CQ-TV that is.

BONEX CATALOGUE

Due to the success of Bonex's centre fold advertisements which have appeared in recent CQ-TV's, they have decided to produce a complete stock catalogue. However, rather than having them printed and relying on customers asking for a copy, the new catalogue will be serialised in CQ-TV.

You will have found that the first part is included with this issue. Please do not destroy it as it will be added to, and updated, in future magazines.

The reasons for making this part separate are threefold: (a) It does not take up valuable copy space in the magazine (our printers can only staple 100 pages so I can't make it any larger!), (b) since this is the first (and probably largest) part, separate stapling makes it more convenient to keep and use and (c) it keeps CQ-TV up with the modern trend of putting extra inserts in newspapers and periodicals!

I am very pleased to have received several reports from members expressing their delight of the super service which Bonex offer. Not only that they support ATV groups as well as ATV in general, so well done Bonex.

Oh! and don't forget to visit their stand at the next BATC show in May.

BATC SHOW - MAY 3rd

Don't forget that this years show will take place on Sunday May 3rd. The venue will again be the Post House Hotel, at Crick (Nr. Rugby) and full details will be included in the next CQ-TV.

We look forward to seeing our old friends and the usual interesting, high quality stands, and also to welcoming some new faces, showing off some new equipment. Also there will be a strong delegation from the newly formed European ATV Working Group (see feature elsewhere in this issue).

This show will also include an extraordinary general meeting of the BATC to which all paid-up members are invited. This one will detail some very important changes in your club's affairs (more in the next issue).

CQ-TV EARLY CLOSING DATE

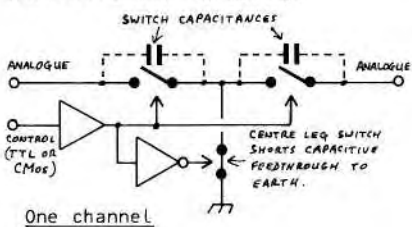
Due to the date of this years BATC show (Sunday May 3rd), I am having to bring forward by a couple of weeks the closing date for CQ-TV 138. This is to ensure that the issue is delivered to members somewhat before that date. The new copy closing date for the next issue then is March 7th.

NEW VIDEO SWITCH

For too long now there has been a distinct lack of good electronic switches which will isolate video frequencies adequately. All that has changed.

GE Intersil has introduced two chips to do precisely that job; one, a two channel (IH5341) and the other a four channel (IH5352). Each channel uses a unique "T" switch that short circuits capacitive feedthrough to ground when the switch is open, this provides extremely good isolation.

75-ohm maximum 'ON' resistance.
Better than 60dB isolation at 10MHz.
Better than 60dB isolation between channels.
Break-before-make switching.



One channel

Anyone using these devices as part of a vision switcher is invited to write it up for CQ-TV or contact me regarding the same. Thanks.

LICENCES FOR TVRO EQUIPMENT

Considering the rapid increase in popularity of TVRO reception by BATC members, I thought it might be appropriate to re-run an item from CQ-TV 131 dealing with licences in the U.K.

"A licence is available for those wishing to receive satellite TV transmissions in their homes. The licence, costing £10, is valid indefinately and covers the use of TVRO equipment only; it does not give permission to receive broadcasts. Anyone erecting a TVRO dish in their garden must also comply with any local planning regulations.

Form BR39, "Application for a Licence for Television Receive Only Satellite Receiving Equipment (TVRO)" is available from the Department of Trade and Industry, radio regulatory division, 24-26 Newport Road, Cardiff CF2 1SY."

In reply to questions from members, this licence is not required in order to erect and use a dish for amateur radio and TV purposes - the licence specifically states "TVRO equipment". Of course, if such amateur equipment is capable, and used for receiving satellite transmissions as well, then the licence will be required.

NEW QTH FOR CONTEST MANAGER

Mike Wooding, G6IQM, Contest manager, Awards manager and assistant Editor has recently moved to a new QTH - on TOP of a decent hill this time! Consequently any correspondence concerning the above functions should now be sent to his new address: 5 Ware Orchard, Barby, Nr. Rugby, CV23 8UF. Tel: (0788) 890365.

Now Mike too can work people on 24!

1987 BATC SHOW - 3RD MAY

TO BE HELD AT THE POST HOUSE HOTEL, CRICK, Nr. RUGBY. (Just of exit-18 of the M1 motorway. Everyone welcome, free admission, excellent catering facilities etc. etc.

FULL DETAILS NEXT TIME

SCANNING & SYNCS

Part-1

by John Goode

One area of ATV where practices can diverge from the "received wisdom" of Broadcast Standards is that of scanning and synchronisation. This occurs because to many people the full-spec. system seems unnecessarily complicated, and simpler systems seem to work just as well. By taking a closer look at the various methods that can be adopted, it may be possible to see where use of the full-spec. system is an advantage, and where it is possible to take short cuts. As with all other technical matters, a logical and sensible decision can only be made if the subject is clearly understood.

SCANNING.

Let's begin with a look at interlaced scanning. In Fig.1 I have shown a notional 11-line 2:1 interlaced raster, and in Fig.2 a simple sync-train that would be necessary to produce that raster. Starting at the top left, the first five-and-a-half lines (shown as full lines) constitute the first, or odd field. The point is that the second, or even field starts with a half line, causing the second group of five-and-a-half lines to fall into the gaps in the first field. The accuracy of the interlace is dependent upon this half-line difference between fields being maintained, and from this, it follows that a 2:1 interlaced raster must have an odd number of lines. In the above case we have 11 lines in the complete raster, and this is known as one FRAME - one frame therefore consists of one even, and one odd field.

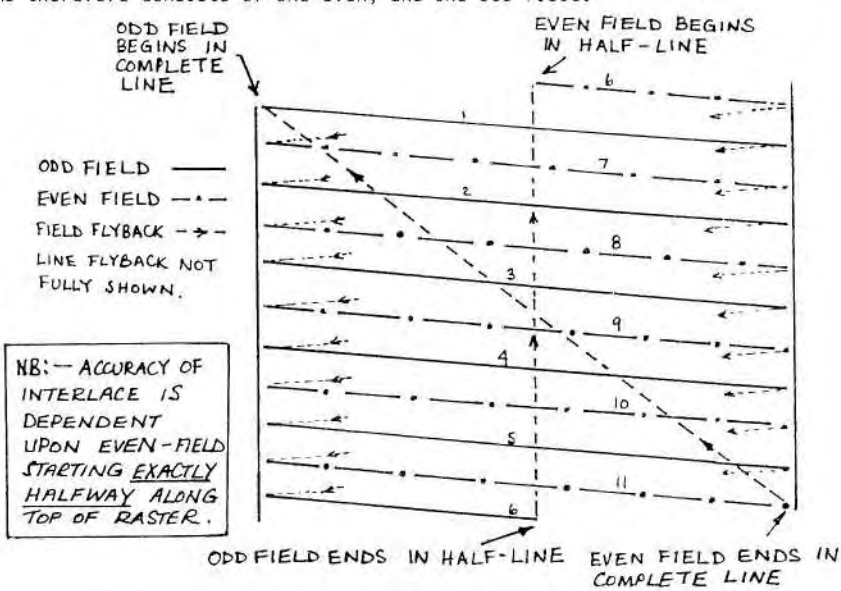


Fig.1 11-LINE RASTER, 2:1 INTERLACED

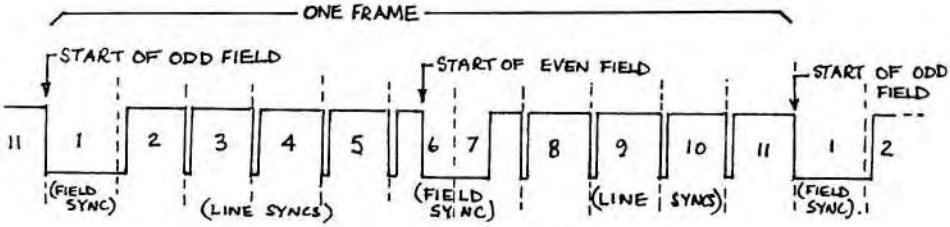


Fig.2 SIMPLE SYNC-TRAIN TO PRODUCE 11-LINE INTERLACED RASTER.

Why interlace though? Well, the purpose of it is threefold:

(1) To conserve bandwidth
(2) To reduce flicker
(3) To improve vertical resolution

To explain this in more detail, we must go back to first principles. Obviously, in any television system the maximum vertical resolution is determined by the number of active scanning lines in the picture. In the UK 625-line system, this is 575 if 50 lines (25 per field) field blanking is subtracted. In fact, it has been found that when the screen is viewed from a distance such that the line structure is invisible, the vertical resolution decreases by a factor of about 0.75, the so-called "Kell Factor" (after investigations by R.D.Kell). This gives a resolution of about 430 lines.

It is assumed that the horizontal resolution in any system should be equal to the perceived vertical resolution. The aspect-ratio of the picture is 4(H):3(V), and so for maximum resolution we should have 4/3 x 430 = 574 "lines" per active TV line. In order to generate 574 "lines" vertically we need half that number of sinewaves, as each cycle will generate one black and one white pixel (picture-element). This leads to the figure of 287 cycles per 52uS, the active line period. Dividing 287 by 52 will give the number of cycles per microsecond; this will be the same figure as MHz, of course (think about it).

$$287/52 = 5.519\text{MHz}.$$

Thus we have arrived at the familiar figure of 5.5MHz as the ideal bandwidth for the 625 line, 25Hz system. However, for our purposes, we could do with a formula illustrating the general case of bandwidth and scanning systems. Such a formula is

$$B = \frac{PAN^2}{2} \qquad \text{.....(1)}$$

Where B = Ideal Bandwidth
P = Picture (frame) frequency (Hz)
A = Aspect Ratio
N = Number of ACTIVE lines per frame.

Substituting in the above,

$$B = (25 \times 1.33333 \times 575 \times 575)/2 = 5510402 \text{ Hz}$$

$$= 5.51 \text{ MHz}.$$

Another important result is obtained by multiplying the frame-rate (P) by the total number of lines per frame (L):-

$$Lf = P.L \qquad \ldots\ldots\ldots\ldots (2)$$

This is known as the LINE FREQUENCY (Lf) or HORIZONTAL FREQUENCY (Fh) of the system, and is fundamental to the process of sync generation. For the 625-line system,

$$Lf = 625 \times 25 = 15{,}625 \text{ Hz}.$$

Returning to formula (1), we can see that the effect of an increase in the frame rate, the aspect ratio, or the number of lines per picture all lead to an increase in required bandwidth for ideal resolution. Now let's bear this in mind, and return to the question of interlace.

It has been well known, since the early days of the cinema, that it is possible to present the illusion of smooth continuous movement to the human brain by rapidly presenting to the eye a series of still pictures. In order to eliminate jerky movement, the rate of presentation needs to be at least 24 frames per second; however, at this rate flicker is still quite objectionable. In order for the flicker to be eliminated the projection rate has to be almost doubled, and this was obviously uneconomic in film. The problem was solved by gating each of the 24 frames twice, so that effectively the projection rate is 48 frames/sec, although only the 24 frames/sec required for smooth movement are shot.

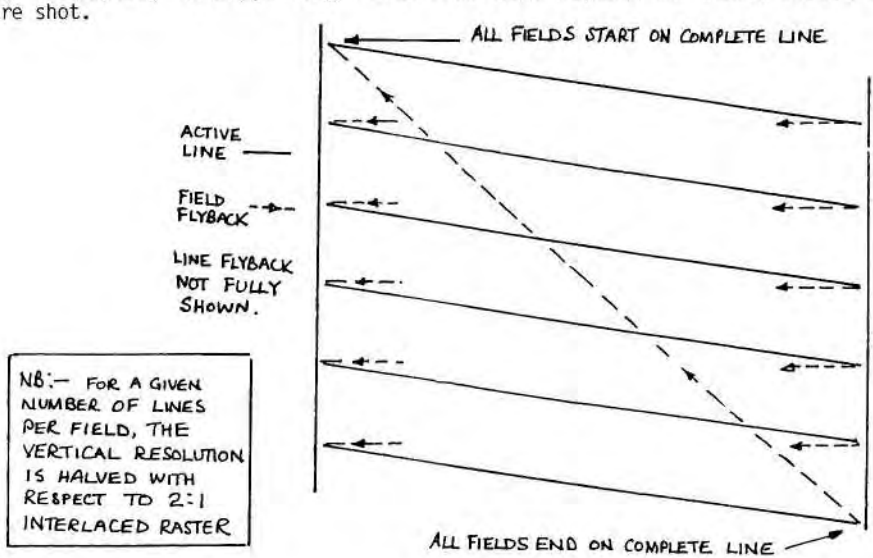


Fig.3 6-LINE SEQUENTIALLY-SCANNED RASTER

A similar problem occurs with 25-frame/sec television. If the frame rate were doubled to 50/sec to eliminate flicker, from equation (1) it follows that the bandwidth requirement would be doubled. The idea of interlace is therefore a way of electronically "gating" each frame twice, by scanning first the odd, then the even, fields. Since we still have the same number of lines per FRAME, bandwidth is not increased. However, although the idea of two interlaced fields is a brilliant solution to the problem, under certain conditions large bright areas of the picture can still exhibit some flicker with 25Hz systems.

In Fig.3 I have shown a 6-line non- interlaced raster, which would compare in required bandwidth with our 11-line raster from Fig.1. In order to compare the two, let us assume a notional frame frequency of 25Hz, Fig.1 having two 5.5 line interlaced fields, and Fig.3 having two 6-line non-interlaced fields. Using equation (1), Fig.1 would require about 2kHz of bandwidth, and Fig.3 about 2.4kHz. Inspection of the drawings though shows that the vertical resolution of the non-interlaced raster, Fig.3, is much poorer than Fig.1. this is because the lines of the second "field" are identical to the first, and lay "on top" of them.

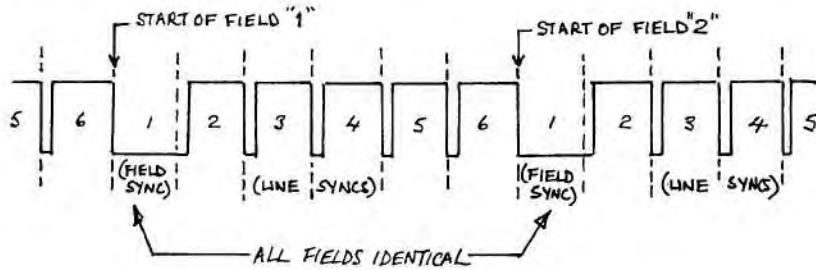


Fig.4 SYNC TRAIN TO PRODUCE 6-LINE SEQUENTIALLY-SCANNED RASTER.

Another type of scanning that is likely to be encountered outside broadcast TV is the so-called "random-interlaced" scanning. In this method line and field syncs are generated independently, and so there is no fixed relationship between them - this is illustated in Fig.5. It is not possible to show a waveform diagram of this mode, as the relationship between line and field sync is quite unpredictable. Many of the older low-cost monochrome vidicon cameras used this mode when selected to "internal-sync" - usually the line-sync was derived from a free-running oscillator, whilst the field sync was taken from a low-voltage winding on the mains transformer. Due to its unpredictability, this form of scanning is a real problem if any signal processing involving sync-regeneration is required - usually it isn't possible. Also, if you have access to any second hand broadcast equipment, unless it is something straightforward like a D.A., you will almost certainly find that it will not accept random interlaced signals.

For comparison, Fig.6 shows diagrammatically the method for generating a 625-line 2:1 interlaced signal. Two points to note here are - (1) that both line and field frequencies are derived from a common oscillator; and (2), the interlace is generated by starting from TWICE line frequency, and by dividing by the number of lines per FRAME, we arrive at the FIELD frequency. A moment's thought about this method should make it clear that 312.5 lines will be generated in each FIELD, the requirement for interlaced scanning.

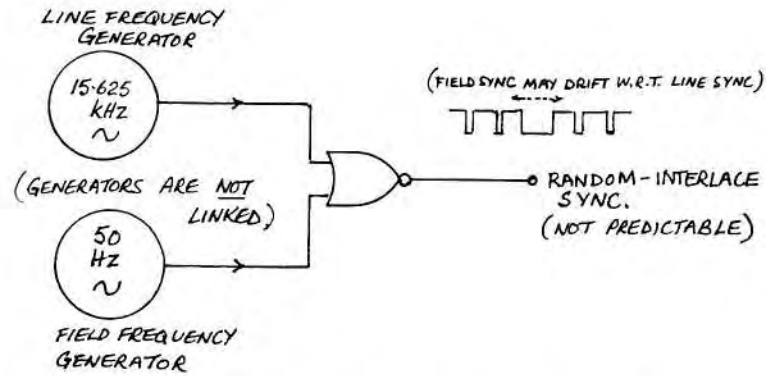


Fig.5 "625-LINE" RANDOM INTERLACE GENERATOR.

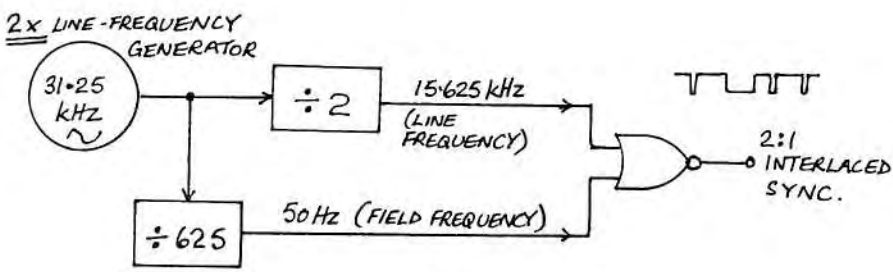


Fig.6 625-LINE 2:1 INTERLACE GENERATOR.

To be concluded in the next issue of CQ-TV.

KEEP 405 ALIVE

Together with a number of fellow enthusiasts, we have recently formed the 'Keep 405 Alive' society. The purpose is not only to preserve items of equipment from the world's first high-definition television system, but to enable us to keep them in working condition for others to enjoy.

The annual subscription to the society is £2 per year plus 4 SAE's for the quarterly newsletters. It is hoped to produce the first newsletter shortly, and it will carry, among other things, free advertisements for members wishing to buy, sell or exchange 405-line items.

Please send a SAE for further details to: Bill Journeaux, 7 Blair Avenue, Poole, Dorset BH14 0DA or phone on (0202) 748072.

INTERNATIONAL ORGANISATION FOR ATV

by Andy Emmerson

Europe now has its own international ATV organisation, called EATWG. Its full title, European Amateur Television Working Group, means that apart from AMSAT this is probably the first time that a speciality mode has organised itself internationally. EATWG is an umbrella organisation which will promote and protect the interests of ATVers. It seeks to gain official recognition from national amateur radio societies and also from the International Amateur Radio Union (IARU), and it may serve as a model for similar interest groups for other modes.

As I have said before, ATV finds itself threatened from several directions, not only by governments who wish to confiscate parts of the amateur spectrum for other uses (look at Belgium) but also by misguided amateurs who consider that a wideband mode is not in the interests of amateurs as a whole. They do not realise that wideband modes are the sole justification for a full 10MHz allocation at 70cm, for instance, even to the point that in Switzerland it is the national radio club, USKA, and not the official authorities, who have banned ATV on 70!

In many European countries there are, and have been for decades, significantly more ATVers than satellite enthusiasts, and it is therefore vital that when IARU decisions are made they must be based on full information and data.

TOGETHER AT LAST

This kind of task is exactly what EATWG will undertake, together with the promotion of ATV operation and maintaining co-operation between the different users of the amateur UHF and microwave bands. Co-ordination of bandplans, technical standards and also contests will from now on be carried out on an international basis. We have a healthy financial base and a strong organisation incorporating all the active ATV groups of Europe. Meetings will now be held annually and a regular newsletter will be circulated in the meantime.

TO BASEL AND BACK

The first meeting of EATWG was held over the weekend of 20/21 September in Basel, Switzerland among extremely pleasant surroundings. Our host was USAT, the Swiss ATV club, and the conference was held in purpose-built rooms at an exhibition centre surrounded by beautiful parkland. There was even a greeting and good wishes from the Gemeindepraesident, the leader of the local president.

Proceedings went out live over the local DBORV television repeater as well as being recorded on tape. Organisation was first rate, and trips were also arranged to a TV facilities company, the repeater site, an electronics training centre and radio and electronics emporia. The hospitality of our Swiss hosts was also magnificent - we were wined and dined in superb fashion and each speaker was given a hand-painted plate as a memento of this auspicious occasion.

PERSONALITIES

A total of 35 amateurs attended the proceedings and representatives had come from Britain, France, Belgium, Holland, Italy, Austria, Germany and, of course, Switzerland. The British contingent numbered Trevor Brown G8CJS, Graham Shirville G3VZV and myself. For my sins I was elected chairman of the new working group and as a result my head (and my workload) has swollen even larger than before!

G8PTH (L) with F3YX

The BATC is by far the largest ATV group in Europe (probably the world) and we therefore offered to support the costs of EATWG by up to £1000, a small sum to protect the interests of ATVers. Other organisation of EATWG is being undertaken by our German partners in AGAF.

It was particularly pleasant to meet Marc Chamley F3YX, who has done so much for ATV in Europe and who designed our 24cm FM TV system, at this event. Some people have seen the video of his complete mobile TV studio and 70/24cm relay station in an estate car ... well, this is no longer. Marc now has a set-up twice the size in a red Peugeot diesel van, still complete with rotator mast on top! Output is 100W on 70 and 10W on 24, all from batteries (no generator is used).

Other technically gifted people came too. Hansruedi Schaer HB9TJ brought his point-to-point TV link system which requires no licence - it uses LED lasers! With just 5mW output he can cover a 3km path: the only tricky bit is finding the narrow beam at the distant end. Another fellow had brought a QRO transmitter for beaming the conference proceedings up to the repeater on 70cm. Using a Thomson TH308 triode this beast easily produced 300 or 400 watts power - even the blower had another blower trained on it to keep it cool! With a normal gain antenna this chap had many kilowatts of output on 70cm ...

STATE OF THE NATIONS

Apart from the discussions relating to the organisation of EATWG (which predictably went on well past midnight), each of the national groups gave a presentation on the situation concerning ATV in their country. Many interesting points came out in these talks, and some details follow.

F3YX reminded everybody that the international TV calling frequency, 144.750MHz, is a repeater input in France and 144.17MHz SSB is used instead. He also made the pint that this frequency gives no disturbance to a 70cm TV picture; its third harmonic is lost in the sound rejection trap. On 70cm he said that one can achieve an apparent gain of 6 to 8dB by narrowing the receiver bandwidth to 1.0 or 1.5MHz.

More than 50 per cent of French stations can now recieve PAL colour as well as SECAM, though not necessarily in negative modulation. PAL gives up to 6dB improvement over SECAM on weak colour signals.

The French ATVers hold a convention every two years at Poitiers, on the third weekend of September. Marc pointed out that the next will take place in 1987,

and several people got out their diaries immediately. The normal French vision frequencies are 438.5MHz (AM) and 1255MHz (FM). A second 24cm channel might be used at 1245MHz: this would replace the 1227.5MHz used in the days when the French 24cm band extended only as far as 1260MHz.

Robert Zak OE1RZB explained that FM ATV is not yet permitted in Austria, despite the arguments of amateurs that they should exploit new technologies. There is one ATV repeater in Austria, OE5XLL, located 1000 metres above sea level 10km north of Linz. It has already been worked from Munich under good conditions. Currently it operates under remote control on two metres, with an input on 434.25MHz and output on 1280MHz. Additional inputs planned include 23cm AM and FM, and 13cm FM.

NO INTERNATIONAL BANDPLAN

It was clear that no single bandplan for TV would suit all countries, either on 70cm or 24cm. The different systems for FM voice repeaters and the activities of primary users rule this out, and Paul Veldkamp PA0SON pointed out that the official IARU scheme for 70cm is unworkable. In this, 439.25MHz is given as a vision carrier centre and the upper sidebands would clearly exceed the band. And if our own plans don't make technical sense, how on earth can we expect national licensing authorities to listen to us?

BEING POSITIVE

Moving to FM television, the meeting agreed that sync should occupy the lowest frequency (positive modulation). This is what is already observed by all ATVers (and by video recorders!). Holland and Germany followed the CCIR-405 pre/de-emphasis norms, but F3YX found you need pre-emphasize only the colour subcarrier and then only by 6 to 8dB. For best signal to noise ratio French stations employ +/-3.5MHz deviation and occupy a bandwidth of 10 to 12MHz. The Dutch by contrast use a bandwidth of 22 to 25MHz. Luckily our receive systems can tolerate these variations for international DX!

Andy Emmerson, G8PTH and Trevor Brown, G8CJS on the EATWG rostrum.

HB9RWD delivers his lecture.

F3YX added that he devised his FM system in 1976 and there are now 150 stations using it in France. On 70cm there are about 1000 ATVers. Three repeaters are planned, at Marseilles, Toulouse and Paris. These will be 1255MHz in and 438.5Mhz out (they may have 24cm outputs later).

Egbert Zimmermann DD9QP gave a graphic explanation of FM television and proved how you need less power for a noise-free picture than with AM. Originally they had settled on 1275MHz as the FM frequency, but this is now 1260MHz because of radar interference. he mentioned a proposal to put an FM TV transponder on the D2 flight of the space shuttle. The equipment, to be built by Bremen university, would have its uplink on 1267 +/- 2MHz and a 10W downlink on 2425 +/- 25MHz. Many questions are still open, but using computer-controlled antennas contacts would be perfectly feasible without excessive power.

Andy, G8PTH and Graham, G3VZV inspect some nice gear.

HB9TJ's laser TV system can carry one TV signal with stereo sound or several audio signals multiplexed together. The only problems are rain, air turbulence and birds flying across the beam. Wavelength is 800-900nm, using an infra-red semiconductor laser, and he gave out a block diagram of the system (send me an SAE for a copy).

In Holland PA0SON said their first TV repeater, PI6ATR, is now operational. Input is 1252MHz FM and output 1285MHz (AM). It is located at Aalten but will move to Raalte. Another machine (FM in and out) is being built at Eindhoven, and more will follow if these two are successful. They suffer only one 23cm radar, on 1297.5MHz, about 20km south of Utrecht.

Their 13cm band is shared with other users, including private point-to-point TV links - interesting! ATV has in fact come a long way since the first experiments in 1953, when they radiated on two metres (now there's an idea!). Activity soon shifted to 70cm, where the bulk remains. The normal ATV frequency is 434.25MHz, though 439.25MHz is used in the west of the country due to QRM from English voice repeaters.

Dutch amateurs have successfully asked the Dutch government to move Syledis out of the amateur band to above 440MHz, but they still suffer some interference from Syledis systems in Belgium and Britain. In general they have very good relations with the authorities.

TRADE SCENE

On the Continent most amateurs build their own ATV equipment. Indeed, PA0SON said only three of the 500 or so ATVers in Holland used commercial equipment, and they were laughed off the air whenever they came on!

For 24cm some Japanese made equipment was on sale at the EATWG meeting. Unfortunately it was for AM, not FM. There was a 1 watt transmitter by Raly Tusinki, and receive converters by this firm and Adonis. From Prokom in Denmark came a superb-looking vestigial sideband filter for 70cm. It has an insertion loss of under 2dB at 434MHz and greater than 60dB attenuation at 430MHz. Fitted with either BNC or N type connectors, it costs around £100.

THE G11 TV CHASSIS ON 70CM

By Eric Edwards, GW8LJJ

Now that the G11 series of Philips and Pye televisions are coming on to the second-hand market at reasonable prices, it is worth considering them for 70cm ATV. With just a simple modification to the tuner it is possible to tune into the 70cm band directly, whilst still maintaining normal broadcast reception capability. The tuner/IF strip can also be used independently of the TV set to provide a complete 70cm down converter/IF system, the only extra circuitry needed being a video buffer amplifier to bring the output to 1v p-p into 75-ohms.

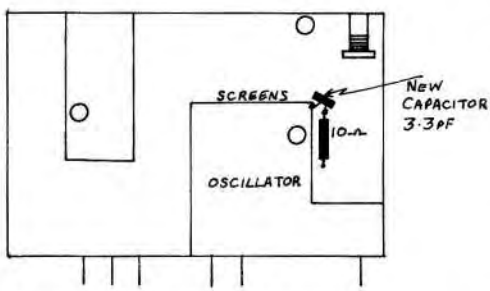


Fig.1 U321 tuner modification

To modify the tuner 'in situ' all that is required is the addition of a 3.3pF capacitor inside the U321 tuner. Remove the tuner from the printed circuit board and take off the covers. Locate the 10-ohm resistor adjacent to the oscillator section as shown in Fig.1. Solder the 3.3pF capacitor to the resistor as shown with the other end soldered to the screen, ensuring that the resistor remains connected as normal. Replace the covers and return the tuner to the printed circuit. The tuning range with this modification fitted will have been extended to cover the 70cm band, without altering the range of coverage of the broadcast bands. With the addition of suitably tuned pre-amplifiers quite acceptable results can be obtained on 70cm ATV.

A more convenient method for shack purposes however is to use the unit as a normal up converter system. To achieve this remove the complete tuner/IF strip from the television and carry out the modification to the tuner as described above. A tuning control and the external connections to the board are shown in Fig.2. The supply to the tuning control must be well regulated and adjustment of the tuning range is achieved by varying the value of the 100k resistor. With the resistor values shown in Fig.2 only the very bottom end of the UHF band will be covered and it is unlikely that any domestic channels will be received.

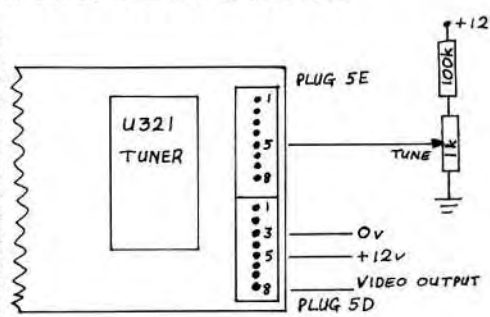


Fig.2 External connections

The video output from the tuner/IF strip is around 0.95v p/p at high impedance, so, in order to use it effectively, a buffer amplifier must be provided to produce 1v p-p into 75-ohms. Fig.3 illustrates a suitable amplifier circuit, the input is connected to pin-8 of the IF unit and the potentiometer VR1 adjusted to give 1v p-p output when terminated with 75-ohms.

The results when using this converter system are comparable with other custom built units and has the advantage of a video output rather than UHF, thus eliminating broadcast breakthrough interference on the TV receiver.

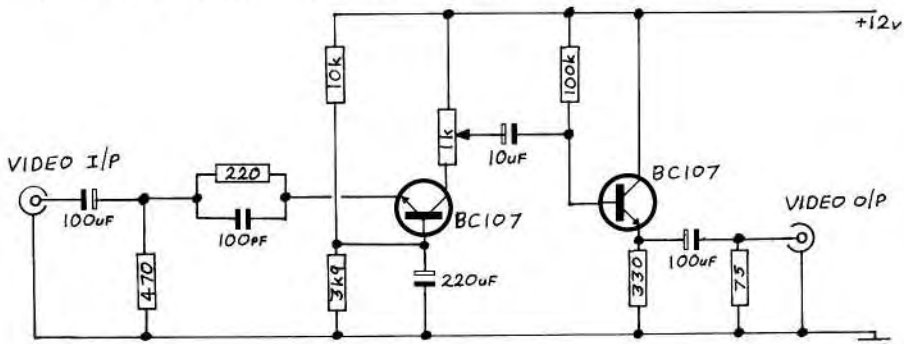


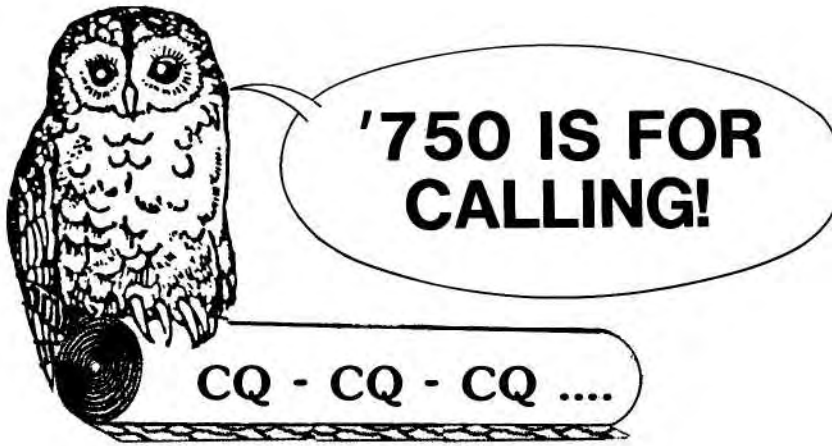
Fig.3 Video buffer amplifier

WHAT MICROWAVE BANDS?

What does working ATV mean to you? Certainly 70cm and, if you're keen, 24cm as well. The odd boffin does have a bash at 10GHz, but how many actually use the other microwave bands available to us? Do you even know what they are? In case you can't quite recall a complete list is shown below:

BAND		FREQUENCY		
70cm		434	to	440 MHz
24cm	1.2GHz	1240	to	1325 MHz
13cm	2.3GHz	2310	to	2450 MHz
9cm	3.4GHz	3400	to	3475 MHz
5cm	5.6GHz	5650	to	5680 MHz
5cm	5.7GHz	5755	to	5765 MHz
5cm	5.8GHz	5820	to	5850 MHz
3cm	10GHz	10000	to	10500 MHz
1.25cm	24GHz	24000	to	24250 MHz
0.5cm	47GHz	47000	to	47200 MHz
0.3cm	75GHz	75500	to	76000 MHz
0.2cm	142GHz	142000	to	144000 MHz
0.1cm	248GHz	248000	to	250000 MHz

All that can really be said now is let's see you use them.....ALL OF THEM!!! A years free subscription for the first ATV QSO on 248GHz!



We all know that 144.750MHz is the International amateur television calling frequency. So why is it that some users carry on lengthy QSO's on it, thereby reducing its usefulness to others in their area?

Unfortunately, as ATV becomes more popular, there seems to be an increasing tendency in many parts of the country to use the calling channel for long contacts and chats. In fact CQ-TV has received quite a number of requests from frustrated members, asking if a note could be put in the magazine about it.

OCCUPATION

Of course we all appreciate that the channel should be used and, perhaps in sparsely populated areas, it may be a good thing to occupy it more in order to demonstrate that this officially allocated channel is used regularly. Nevertheless, especially in more densly populated areas, a certain degree of responsibility is required in its use and, unless the contact is very short, one should always QSY to another channel after making contact. I know we all forget sometimes (yes, me as well) but please TRY to remember.

SHOULD KNOW BETTER

I have to say that during the '86 International contest and the tropospheric opening in November, I heard several stations who seemed to want to operate almost exclusively on '750. During the opening in particular I listened to more than one QSO which lasted for over an hour each. Unfortunately the culprits were often 'old hands' at TV, and should therefore know better. Whilst on the subject there are also a number of stations who insist on transmitting pictures on 70cm for very long periods at a time. OK when there is no opening and/or there is little likelihood of others in your area wishing to transmit video at the same time, but it is rather thoughtless when there is.

Do please try to have a little thought for others chaps. Everyone deserves a chance to work stations so let's try to be as considerate as we can eh?

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TV ON THE AIR

by Andy Emmerson G8PTH

-SLOW SCAN NEWS-

With the onset of winter, the slow-scanners have emerged from hibernation, and I'm pleased to record a few letters from this fraternity. Dave Probert G4JBU sends a note to let us know there are still a few SSTVers knocking around in the West Midlands. "I have been very active myself," he writes, "as well as having set up an SSTV station for the Boy Scouts' Jamboree on the Air, which was very successful. We worked into the States and Italy, and a superb 'cop' was a T77G in San Marino - probably the only SSTVer in that country. Arthur G5KS, Ken G8DIR and Alan G1TBL are all active on slow-scan locally, and we shall shortly be getting another convert, Jack GOESP, who has just purchased a second-hand Robot."

At the St. Alban's rally I met Arthur G3RYF, who reminded me that there is a slow-scan net daily (except Sundays) on 7040kHz. It starts at 08.15 GMT and has participants from Austria, Denmark and German - as well as the UK. Everyone is welcome, and this regular session will be useful if you wish to test a receive converter and need a signal. Arthur has just built the ZL1 converter and is now ironing out the gremlins.

Now a letter from Dudley Gordon GW6ZUQ, who is in Chepstow. He says "I have recently acquired a DRAE SSTV transceiver and am looking for contacts on two metres. Repeated calls on 144.50 have brought no response. Anyone interested in contacts can arrange skeds by ringing 02912-6867 and I shall be only too happy to try. HF facilities are an FT-707 which has been in use for many years as an SWL, and recent pictures include a large number sent by JOTA stations and during European contests. The highlight for me and the children was a set of pictures sent from Italy showing Disney characters. I am a member of two local clubs, and the Newport Amateur Radio Society hope to be active on Monday nights with HF SSTV on 80 metres (callsign GW4EZW). They look forward to the contacts and also have facilities for ATV on 432MHz."

A phone call from Andy G6OHM in March (Cambs.) advises us that thanks to the Fenland net, SSTV is very much alive in East Anglia. Regular participants include the relocated G3WW, G6SXB (Les, a newcomer), G4TUK, G4RRY, G6YQC, G4BDD and others. So beam towards the east and see what's happening!

Finally two letters from Sandy Pimlott G8IDE in St. Budeaux by Plymouth, who was attracted to SSTV a couple of years ago by a Bernard Babani paperback. Book no. 215 "Shortwave Circuits and Gear for Experimenters and Radio Hams" contains an article on building an SSTV monitor, and sandy decided he could construct this virtually from junk-box material. Finding a suitable tube was not easy, though, and evetually he settled for a Brimar SES-DP2 (but no data!). Anyway, this was made to work and signals were received at length on 14.230MHz. "Great fun!" says Sandy: "Shades of Logie Baird as ghostly letters and shapes punctuated by bright flashes appeared on the screen. And much more fun than drivelling black boxes!" Sandy has also built his own camera to record the SSTV pictures as "hard copy" (no simple Polaroid for him!). The camera is made of plastic drain pipe and a plant pot, with a lens from an old projector. Pictures are recorded direct onto contact paper, and exposure timing is controlled by an Answerphone mechanism! Sounds fabulous and I have

seen the results to prove it, though they would not be easy to reproduce here. Sandy would be pleased to hear from anyone who knows where to obtain slow-speed negative slides (glass or celluloid).

-MICROWAVE MATTERS-

We start with Terry Court G4AIG, who lives at Corley Ash near Coventry. He says he is now active on 10GHz ATV. The equipment has been built and he is ready for portable operation, so watch out for G4IAG/P!

Peter G3PYB and Barry G8AGN have both worked /P from the TV tower at Emley Moor, making a one-way contact with Derek G0BTA/P in Steinigot, Lincolnshire. Steve G8EBM has a TWT working on 10GHz and can send ATV. He is anxious for skeds with anyone in a 75 mile radius of Derby for 24GHz as well!

The Crawley repeater GB3CT has been on the air since 2nd November, as you will probably know if you are within viewing distance. They have solved the problem of varying deviation levels, caused by people sending different video levels on the input. The cure is a Worthing group video AGC module, which brings all video levels to a fixed 1 volt. This little gadget is highly recommended and can be obtained from the group for £16 (see ad elsewhere in this issue).

At Brighton the Worthing repeater was re-established on the same day (confused?). It now uses two G3JVL quad yagis for tx and rx beaming west. These may be converted later to a steerable array. P5 pictures are received from the repeater from Brighton along to Chichester, so the new site is a great improvement. Reception reports have been received from as far away as Portsmouth, where G3VPS gets in with P3 results. Other P5 users include G4WTV, G6CSX, G8KOE, G1NBX, G8VEH, G6MPE, G4LXC, G4HSY, G8DHE, G8XRX and G8XEU. I am told activity was like bedlam on the opening night - let's hope it is sustained! Never short of new ideas, the repeater group is now considering establishing 10GHz links to the repeaters at Crawley and Hastings. The latter is definitely a line-of-sight path and the Hastings repeater itself should be on the air in a few months' time.

At Bristol work proceeds apace on GB3ZZ. The hardware is partially built and site trials from the actual location were held on 2nd November. The 3-5 watt pilot transmitter was received with P4 pictures 24 miles away in Stroud, so the site seems to be adequate! The finished repeater will run the full legal limit with a BLV93 p.a.from LMW Electronics. They have bought an Alford Slot antenna from G3JVL (and were donated free crystals by Quartslab - good for them!). The rest of the transmitter uses Wood & Douglas modules, and the latter firm also supplied a GaAsFET preamp, at a special discount (good for them too). The receiver itself is a modified R&EW downconverter feeding a Wood & Douglas 50MHz VIDIF and sound board. Test card is produced by the R&EW/Worthing device and logic is modified GB3US. Duplexing into the antenna is with interdigital filters made up from designs in the RSGB VHF/UHF Manual. Shaun G8VPC says they have 30 members in the group now, which is not bad at all.

Moving west towards Oxford, G6ZHC in Cholsey has built the Solent equipment for 24cm and is exchanging P5 pictures with G6IMQ, who is a mile away. The latter is running 10mW from a single BFR96 transmitter and Solent converter plus BATC FM board for receive. G3UMF above Oxford has received the Dunstable repeater with a home-made converter and BATC FM demodulator. In Oxford itself G8PX is still experimenting with his W&D UFM01 + PT4577 linear + TRW MX15

amplifier. This gives 12 watts on 428 MHz, driving a home-made tripler, and produces 4 watts at 1268MHz. Jeff is looking for a good mono camera which runs on 12 volts, so if you have one for sale give him a call on Oxford 58785 (palindromic number!).

-SEVENTY CM-

I had an excited phone call from Simon Hamer, who is a TV-DXer in New Radnor, Powys. During the excellent lift of 30th November last he saw P5 pictures from PE1DWL with just a whip aerial on a portable TV. Many German broadcast TV stations were coming in at the same time, on Band III and on UHF. Jeff Jefferies G8PX pops up again on 70cm with a report on ATV activity in the Oxford area. The local net operates on Tuesday and Thursday evenings as well as Sunday mornings. It is well supported by G3UMF, G4PUU, G6YTW, G6ZHC, G6IMQ, GOCAD and G8PX. Three welcome newcomers are G6MSQ, G8FHY and G8SIN. Jeff has put up a masthead GaAsFET preamplifier and finds a P1 improvement. He is now working on a linear so that he can put out as good a signal as he receives ...

Well, that's it again. Please let me have your news and photos - send them to 71 Falcutt Way, Northampton, NN2 8PH - and have fun.

These photo's illustrate the excellent lift which occured during early December. They show G3DFL (Birmingham) working through the GB3TV repeater on the Dunstable downs.

(The white dashes show Radar interference).

Photo's G3VZV

GB2BBC

To celebrate the 50th birthday of the opening of the first high definition television service, the Ariel Radio Group set up a special event station at Alexandra Palace over the weekend of 1st-2nd November. Although able to provide stations on HF and 2 metres, they enlisted the help of the Home Counties ATV Group to, once again, transmit live television from the second floor at Alexandra Palace.

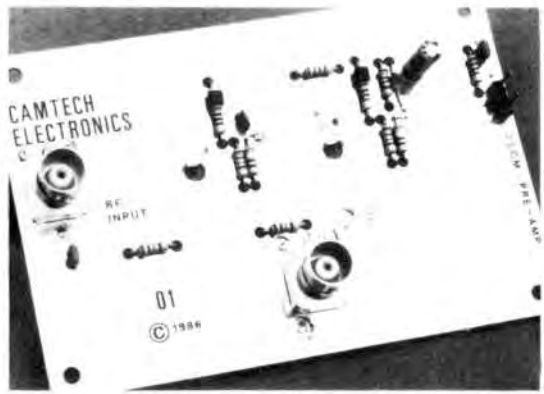
Gary (G4CRJ), John (G8MNY) and Peter (G8KZG) arrived on the Friday afternoon to set up the station. Regrettably, the aerials could not be fixed to the original BBC mast, and although put as high as possible, the 70cm signal had to look through the tower below in some directions. The 23cm aerial was somewhat lower, looking basically to the east. By the time the first pictures were exchanged on the Friday evening, with G4WGZ in Bromley, it was dark, and raining!! Over the weekend Andy (G4WGZ), Mike (G6GIF) and Paul (G8UAV) also manned the station. On 70cm, John's transmitter output was displayed on a waveform monitor and spectrum analyser, indicating a clean vestigial sideband signal, and impressing the professionals from the BBC. Gary made some transmissions on 23cm from outside the entrance to A-P. At one point these were sent to G4VTD, in Croydon, who returned them on 70cm. That it was a line of sight path was evident as in the picture could be seen the Crystal Palace transmitting mast, with its flashing lights, several miles across London from A-P, and close to Ian's QTH ! During the Saturday the A-P staff set up an exhibition in the old Marconi-EMI studio, preparatory to a formal function on the Sunday - the actual anniversary. Although this was not open to the amateur station team, several were able to see the exhibition, including an original style EMI camera, after the guests had left. By the Sunday evening, pictures had been exchanged with a number of stations - best DX being to the Isle of Thanet. The A-P mast was now floodlit - illuminating the rooftop GB2BBC aerials - and the front of A-P lit up in commemoration of "TV AP 36 - 86". It is understood that eventually the old Marconi-EMI studio is to become a television museum.

Not to be outdone! here is a photo' of an amateur TV camera from the early fifties. Built by BATC member Jim Russell the camera used the (at that time) ubiquitous 5527 tube and it formed part of a complete ATV station home-constructed by Jim.

(Photo - BATC archive)

CAMTECH 1.3GHz PRE-AMPLIFIER

By John Wood G3YQC



Camtech Electronics have announced a new 23cm low-noise receive pre-amplifier for the amateur market. The amplifier's centre frequency can be adjusted from 1000MHz to 1400MHz although the bandwidth is adequate to cover most of the 23/24cm spectrum - ideal for amateur TV.

The following paragraph is taken from Camtech's own literature and explains some reasons for using a good pre-amplifier:

'To be able to get the best performance from your 23cm system it is absolutely essential to realise the true front-end performance of your receiver. Many people spend much time and effort, as well as hard earned cash, to improve station performance by installing very high gain aerial systems. This is quite commendable but often not enough attention is given to the aerial feeders, and this is where real gains can be made. For every dB that is lost between the aerial and the receiver RF amplifier you are effectively adding one dB to your receiver front-end noise figure. With typical losses in coaxial cable at 23cm being of the order of 3 to 4dB per 10 metres, this can be quite alarming'.

MANUFACTURER'S SPECIFICATION

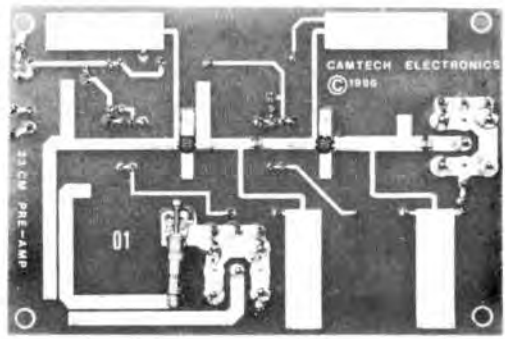
Gain: 14dB (typical)
Noise figure: less than 2dB
Frequency range: 1200 - 1350MHz
3dB bandwidth: 85MHz typical (measured at 1296MHz)
Image rejection filter designed on PCB
1dB compression point: +5dBm (typical)
Power requirements: 12v DC @ 18mA (typical)
PCB measurements: 110 x 75mm
PCB is pre-drilled to take standard RF sockets

DESCRIPTION

The pre-amp is built on a glass fibre laminated board and is based on two NEC bipolar transistors type NE02136. Input, output, and interstage matching is achieved by extensive use of micro striplines and the output is fed through a microstrip image rejection filter which has a 3dB bandwidth of approximately 85MHz.

The amplifier is intended to be mounted at mast head which is where it will be most effective. It can of course be used at the shack end of an aerial feeder but coax losses will be directly added to the overall system noise figure.

The unit is available as a kit, a built and tested board or as a complete boxed unit. The photographs show a built and tested PC board and clearly illustrate the positions of the BNC input/output connectors.



Very comprehensive documentation accompanies the amplifier which includes a full description, specification, construction and alignment information, an excellent circuit diagram and component layout drawing and a performance graph.

LAB TESTS

The unit supplied was adjusted for a centre frequency of 1296MHz and the measured gain was 13dB. The 3dB bandwidth measured 110MHz and the noise figure 3dB. The centre frequency can be adjusted from 1000 to 1400MHz using the tuning capacitor, the gain rose to 14dB at 1000MHz and dropped to 12dB at 1400MHz. The DC current consumption from a 12v supply was 22mA. Gain starts to fall off when the supply is reduced to 10.5v but remains within 0.2dB between 11 and 15 volts. Noise figure stays constant over this supply range.

The test equipment used for the lab measurements were as follows:

Giga GR1120D UHF signal generator
Hewlett Packard HP8558B spectrum analyser
Magnetic AB type 117B automatic noise factor meter
with matching solid-state noise source
Kingshill precision power supply

CONCLUSIONS

Unlike much amateur equipment this unit has obviously been designed with the aid of good test equipment and its performance is 'textbook'. The frequency range is too perfect to have been designed empirically and the unit is unconditionally stable, showing no signs of parasitic oscillation with changing loads - even when the input is open circuited.

The amplifier was placed directly in front of a Wood & Douglas tunable 24cm ATV receiver and produced up to one picture point improvement over the receiver without an amplifier. The unit was not tried at mast head since results with my particular installation would not necessarily be typical.

The quality of the printed circuit is to the very highest standards and reflects the obvious thought which has gone into the design as well as the skill of the designer. The components are of good quality and the construction of the supplied ready-built unit was excellent.

If you examine the position of the coaxial connectors on the board and imagine how it could be fitted into a diecast box, you would probably wonder how the connectors could protrude through the case without the case fouling the

components. The answer, according to the manufacturer, is that the PCB is intended to be mounted in a standard diecast box with the BNC connections kept internal. The coax leads are then passed through the box via grommets. This is possibly the best way of ensuring good RF connections as well as maintaining a water tight seal if the unit were mounted outside. The boxed unit however, although enclosed in a diecast box, has its RF connectors mounted externally.

Typical frequency response measured on an Anritsu MS62D spectrum analyser. Vert - 10dB/div. Hor. 100MHz/div. C/F 1296MHz. Gain 14dB.

This amplifier represents the very best in its field and is extremely good value for money. The use of bipolar devices instead of GaAsFET's is to be commended since they ensure best signal handling performance and reliability under all conditions. The unit is almost ideal for amateur TV applications and I have no hesitation in thoroughly recommending it to you.

CAMTECH ELECTRONICS,
8 Wortham Place,
Haverhill,
Suffolk CB9 0HP

Tel: (0440) 62779

Kit.....£22.50
Built & tested.....£29.75
Boxed.....£41.75
P&P add £1 for kits and £2 for built and boxed units.

F2XO: Gone but not forgotten

It is our sad duty to record the death of a French member, Jean Lambert F2XO. Although he lived in Boulogne, Jean (John) spoke English like a native and indeed he had to, being the manager of the Sealink terminal there. A keen ATVer and home-brew constructor, John made nearly all his own TV equipment in true craftsman fashion, from transmitters and receivers to the camera and test-pattern generator. He was a great supporter of the BATC and much of his equipment was built to BATC designs.

Being so close to Britain, Jean was one of the first French ATV stations worked by UK operators during lifts, and his activity and leadership will be missed also in northern France. Jean was a very lively person and the ironic thing about his untimely death was that having taken early retirement, he looked forward to devoting more time to his hobby - but this was not to be. He will be missed by all that knew him.

CAMTECH ELECTRONICS

NEW

23cm's Low Noise Pre-Amp

This Pre-amp breaks new ground in simplicity of construction and very low cost. It employs two low noise microwave bipolar active devices to give a noise matched circuit with an optimum amount of R.F. gain, it also employs a tunable image rejection filter to give superior performance.

Specification

Gain	14 dB typ
Noise Figure	Less than 2dB
Freq Range	1200 - 1350 MHz
3dB Bandwidth	85 MHz typ
Power Supply	12v D.C. 18mA

Kit £22·50

Built & Tested £29·75

Boxed £41·75

p&p please add £1·00 for kits, £2·00 for built and boxed units.

Orders & enquiries (S.A.E. with enquiries), to;

Camtech Electronics
8 Wortham Place, Haverhill,
Suffolk CB9 0HP
Tel 0440-62779

TUNING THE G3YQC 24cm ATV CONVERTER

By Steve Whalley, G4DVN

Having been persuaded by the assistant editor during a QSO one night I have commited to paper a couple of modifications to the G3YQC 24cm down converter described in CQ-TV 117 and 'TV For Amateurs'.

The original design works extremely well with good stability and covers the whole of the 23/24cm band with a reasonably flat response. The local oscillator is set at approximately 560MHz and tuning over the band is accomplished by using a domestic TV tuner (ELC1043 or similar) as a tunable IF. Whilst this system works very well and is in current use at many stations, I felt that it would be better to make the converter itself tunable, thus fixing the second stage ELC1043 (or whatever tuner is used) on a convenient channel. The principle advantage of this method is that the channel can be selected to avoid any broadcast interference that you may suffer in your area.

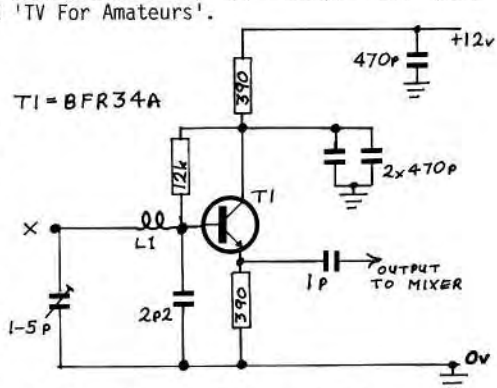


Fig.1 New oscillator circuit

The modification consists of replacing the local oscillator with the circuit shown in Fig.1 and adding the tuning circuit of Fig.2. The main tuning control can be located on the front panel. The oscillator is constructed as shown in Fig.3, mounting the BFR34A as close to the circuit board as possible with the 12k resistor mounted over the top of it. All capacitors are sub-miniature ceramic and L1 is 2 turns of 20swg copper wire with an inside diameter of 4mm and turns spaced by the wire diameter. A degree of 'fiddling' with the relative positions of the components may be required in order to get the oscillator to cover the frequency range you require.

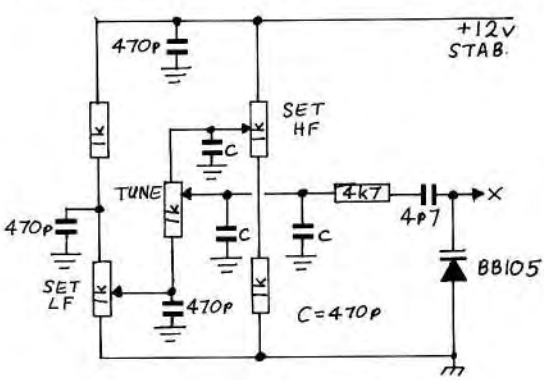


Fig.2 "Tune" circuit

The tuning circuit consists of a varactor diode which is biased by the tuning control to cause a variation in the reactance of the oscillator's resonant circuit. The minimum and maximum frequency of the oscillator, and thus the frequency range of the converter, is adjusted by the SET HF and LF potentiometers.

Another use for this simple oscillator circuit is to provide a low power test beacon. The inductor L1 is replaced by a piece of 16-18swg

wire about 3/8 inches long. By adding the circuit of Fig.4 instead of the tuning circuit and injecting a 1v p/p video signal, a low power transmitter is produced whose frequency is set by the 'SET FREQ' potentiometer.

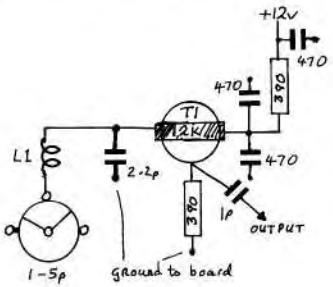


Fig.3 Oscillator layout

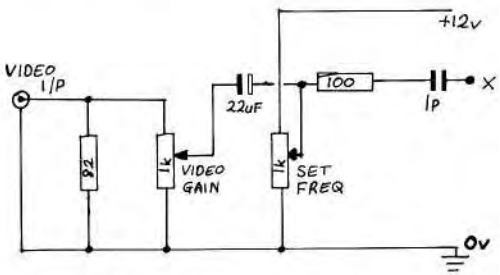


Fig.4 'Beacon' modulator

CONTEST NEWS

By Mike Wooding, G6IQM

I am sitting here in the 'shack' amidst the clutter of a recent house move, most of my equipment appears to have been scattered to the four winds and my lady has just reminded me that it's nearly Christmas. However, it looks as though I might have some semblance of order here in a couple of weeks, meanwhile the magazine marches on!

PLEASE NOTE: the new address and phone number for contest information etc. is shown at the end of the news and also on the 'who to write to' page.

The International was the last contest I had the opportunity to take part in so the rest of the contest information has been gleaned from your entries. I am very pleased to say that the level of activity in the International was good and that the overall standard of operating was excellent. The weather, as per usual, was pretty awful on the Saturday but somewhat better on Sunday, so conditions were generally flat with plenty of QSB and in many cases usually operable paths became difficult if not impossible. In view of this, however, there were some suprisingly good contacts made, especially on 24cm. G3YQC had a P4 one way with G4CBW over a 107km path and G4DVN/P had a P5/P2 two way with G6RAF over a 105km path.

The news from the continent was that there were not many stations active and that conditions were generally poor. In Belgium ON5OF complained of interference from packet radio and intentional jamming from another Belgian station, but apart from that operating seems to have been of a high standard. ON4ABC reported hearing GW8LIR/P, G6RAF/P, G6OKB, G4CRJ and G1COI/P, but despite his best efforts was unable to contact them at all from his QTH in JO10SS.

To say that entries for the Autumn Vision and the Slow Scan contests are sparse could be an understatement! To date I have received six for the AV and a grand total of two for the SSTV. There have been one or two complaints that the contests were not advertised well enough, I concede that full details were not included in each contest news and intend to remedy this in future. In fact upon dicussion with John (the boss!) it has been decided to have a feature display (sounds grand don't it) in each issue advertising those contests occuring before the next issue. However, don't forget that the contest calendar for the year always appears in the first magazine of that year.

A point raised by Peter Asquith, G4ENA, is why don't I publish the contest dates on the RSGB news. This is not as easy as it sounds, and without wishing to get political I shall just say that there have been serious communication problems with the RSGB, and such requests for inclusion in the news seem to have been completely ignored! Perhaps any member of headquarters staff reading this can help.

Right let's get on with your comments:

Peter, G1COI tells me that he almost became 'Maritime Mobile' during the International, but fortunately the guy ropes securing the shack(?) held fast.

Ian, G4VTD suggests that I ask Valerie Stewart to arrange better weather in future. If I did that Ian we in the sticks wouldn't have an advantage HI.

G4WGZ/P wants to know why they were operating from a submarine!

G1COI, yes him again, asks on his Autumn Vision entry "when is G8MNY going to get some new numbers?!"

1986 INTERNATIONAL

A very gratifying contest for my first year at the helm. A total entry of 118, 75 of them for 70cm alone was excellent, although I must admit that it has taken several hours to correlate and produce the results, and I still have the certificates to do yet!

It gives me great pleasure to congratulate the 'G8LIR team' Andy, Fred and Ron for their resounding win on 70cm Section A. I believe that this is the first time a UK station has won this contest, so full marks to the team for their enterprise and determination. Not a few of us suffered near heart attacks though when, just after the start of the contest, they had a severe problem causing a total shut-down, but after a frantic couple of hours they were back on again.

Congratulations to PDOMCl for winning 70cm Section B, to PE1HZR for winning 24cm Section A and to NL5184 for winning Section B.

70cm SECTION A

Place	Call	Points	Contacts	Place	Call	Points	Contacts
1	GW8LIR/P	14276	74	26	F1GXY	2978	17
2	F3YX	12617	48	27	PAOSON	2803	
3	F8MM	9872	37	28	DKOII	2780	22
4	DL4RBB/P	9115	48	29	DKOBTX/P	2653	20
5	DLOPT	8672	39	30	PA3DLS	2602	
6	PE1HXD	8652		31	G1GST	2585	19
7	ON7ZI/A	7393	38	32	PI4ZOD	2527	
8	G4DVN/P	6511	54	33	ON1JV	2525	27
9	ON4ABC	6398	46	34	GW8GIZ/P	2503	23
10	FIFVX	6322	23	35	G6YKC	2497	23
11	PA3BJC	6058		36	PA2ENG	2425	
12	GW8OOJ/P	5977	31	37	F1CIA	2408	11
13	ON7MB	5597	35	38	G1GPE	2399	20
14	G6RAF	5433	28	39	G3YQC	2296	19
15	G8MNY/P	5379	39	40	F5BV	2265	14
16	G4WRA/P	5363	48	41	G1IXE	2138	21
17	G1COI/P	4962	32	42	G1PPD/P	2081	22
18	GOAVG/P	4860	37	43	G4CRJ	2071	19
19	ON5ID	4813	35	44	G6IQM	1968	18
20	G6WOR/P	4585	40	45	DK2RH/P	1946	23
21	F1AGO	4308	14	46	G6HMS	1824	20
22	DLOAAN	4203	37	47	G4VTD	1754	21
23	HB9AP/P	3582	25	48	DB5MJ	1699	9
24	ON5OF	3092	30	49	G4LXC	1600	17
25	DG9RAO/P	3055	29	50	FF6KRJ	1565	15

Place	Call	Points	Contacts	Place	Call	Points	Contacts
51	G6SKO	1534	18	64	G8PX	720	11
52	DD2EE	1487	20	65	PA3CVM	596	
53	F1JFI	1471	11	66	DK6EU	591	18
54	G4HMG	1469	9	67	DK7UG	548	7
55	ON6PM	1419	21	68	G4LXC	543	8
56	PA3CHH	1347		69	DG4SJ	542	6
57	G4VBS	1313	8	70	F1HPR	418	7
58	DH8YAL	1310	22	71	PE1JRX	380	
59	ON4KBF	1118	18	72	PA3DVI	303	
60	ON5IE	1035	17	73	PA3AOG	220	
61	DF7EA	998	10	74	G4TEP	219	4
62	PE1CAW	896		75	G4UAM	84	3
63	PAOHCK	774					

70cm SECTION B

Place	Call	Points	Contacts	Place	Call	Points	Contacts
1	PDOMCL/A	2245		9	PE1JAM	442	
2	PA3DEA	2172		10	NL8506	386	
3	ONLO3482	1834	25	11	F1LQG	309	7
4	NL5184	1365		12	PA3EAH	201	
5	NL8722	682		13	ON5HK	191	6
6	PA3DZA	562		14	DC5JP	106	3
7	ONL6687	542	12	15	DBOOJ	12	2
8	PDODKT	487					

23cm SECTION A

Place	Call	Points	Contacts	Place	Call	Points	Contacts
1	PE1HZR	898		13	F1FVX	421	3
2	G4DVN/P	862	10	14	DK6EU	327	10
3	G6WOR/P	851	14	15	G3YQC	325	5
4	G4CRJ	794	7	16	G6MPE	311	5
5	F8MM	784	8	17	G4WGZ	287	6
6	G1PPD/P	730	10	18	G6RAF	261	2
7	PA3AOG	713		19	DH8YAL	182	8
8	PI4ZOD	673		20	G4VTD	160	2
9	G1GST	559	5	21	F1GXY	125	1
10	G4LXC	543	5	22	PAOHCK	19	
11	F3YX	453	5	23	G6IQM	2	1
12	PA2ENG	444					

23cm SECTION B

Place	Call	Points	Contacts	Place	Call	Points	Contacts
1	NL5184	388		4	PDODKT	105	
2	NL8722	188		5	PE1JAM	88	
3	CON23B	178	6				

1987 CONTEST CALENDAR

Easter Extravaganza	Tue April 21st	0001 to 2359 local	70cm only.
May Day Microwave	Mon May 4th	0001 to 2359 local	23cm and above.
Summer Fun	1200 Sat June 20th to 1600 Sun June 21st (local)		All bands.
International	1900 Sat Sept 12th to 1300 Sun Sept 13th (local)		FSTV all bands.
AutumnVision	Sunday Oct 25th	0001 to 2359 local	All bands.
Slow Scan TV	Sunday Nov 29th	0001 to 2359 local	SSTV only.

ATV Contests - General rules

The following rules apply to all ATV contests throughout the year. Any variations for a given contest will be published in this column prior to the event.

1 - EXCHANGES:

a) A code group consisting of four non-consecutive numbers (i.e. 1865, 9732 etc.) to be individually chosen by each station. This code group to be maintained throughout the contest and to be EXCHANGED IN VIDEO ONLY. If more than one band is worked a different code must be used for each band.

b) Callsign, vision report (0-5), Maidenhead locator and contact serial number starting at 001. This information may be exchanged by video or phone.

c) Transmitting Amateurs who can only receive ATV claim for a one-way contact for each correctly identified TV station. (They enter section A). These stations can also confirm the contact with the transmitting station to allow that station to also claim for a one way contact.

d) SWL stations receiving ATV pictures may enter the contest scoring as one-way contacts. These stations cannot 'give' points to a transmitting station. (They enter section B).

2 - SCORING:

a) Two-way contacts 2 point per km
One-way contacts 1 point per km

b) Stations having the same Maidenhead locator score 10 points for a two-way and 5 points for a one-way contact.

c) Each station may be worked for points once only on each band.

d) Contacts through repeaters do not count.

3) LOGS:

a) The following information should be included in all logs entries: Date, time of contact, callsign worked, report and serial number sent, report and serial number received, code group received, Maidenhead locator, distance worked in km and points claimed.

b) A separate log should be submitted for each band worked.

c) Entries should also include the callsign used and the location of your station throughout the contest, the Maidenhead locator for that location, the code group used for each band worked and the total points claimed for each band.

4) SECTIONS:

a) A - All transmitting amateurs (whether transmitting vision or not).

b) B - SWL stations who are not in direct contact with entrants to section A.

5) BANDS:

The following bands are available for ATV working:

70cm, 24cm, 13cm, 9cm (3.4GHz), 5cm (5.6GHz), 5cm (5.7GHz), 5cm (5.8GHz), 3cm (10GHz), 1.25cm (24GHz), 0.5cm (47GHz), 0.3cm (75GHz), 0.2cm (142GHz), 0.1cm (248GHz).

NOTE. 144.750, 144.800 (not U.K.) 144.170 and 248.1GHz! are well known ATV calling channels. Please QSY to another frequency as soon as a QSO is established.

Finally, a discrepancy that has recently come to my attention concerning the 1985 International and the 1986 Summer Fun contests. It would appear that due to a log reading error, G4WRA/P should have been placed 5th overall in the 1985 International (1st in th U.K.) and 6th in the 1986 Summer Fun. Whilst it is too late to rectify this error I have been asked by the operators of the station to make this announcement. The moral of the story, without going into gory details of how the mistake came about, is to please use the BATC log sheets which are FREE to members, or if you are unable to PLEASE use the same format.

Don't forget that if you require a contest certificate enclose an A4 SAE with your entry. Contest entry forms and log sheets (A4 SAE please), contest entries and any other contest correspondence should be sent to:

MIKE WOODING, 5 WARE ORCHARD, BARBY, Nr.RUGBY, CV23 8UF. Tel: (0788) 890365

INTERNATIONAL ATV CALLING

144.750 MHZ

UNIVERSAL ELECTRONICS

TRANSCODERS INTERFACES

CODE	STANDARD		PRICE
SP2020 INTERFACE	PAL/RGB	Input: PAL video 1v p-p composite Output: R.G.B. plus synchro and sound	£74.40
SP2021 TRANSCODER	PAL/SECAM	Input: PAL video 1v p-p composite Output: SECAM video 1v p-p composite	£107.20
SP2022 TRANSCODER	SECAM/PAL	Input: SECAM video 1v p-p composite Output: PAL video 1v p-p composite	£107.20
SP2023 INTERFACE	SECAM or PAL/RGB	Input: SECAM or PAL composite video Output: R.G.B., synchro and sound	£98.40
SP2024 INTERFACE	SECAM/PAL PAL/RGB	Input: SECAM plus sound, PAL plus sound Output: PAL plus sound, RGB plus synchro, sound	£153.10
SP2028	RGB/SECAM	Input: RGB plus synchro and sound Output: SECAM comp.video (UHF output optional)	£93.00
SP2029	RGB/PAL	Input: RGB plus synchro and sound Output: PAL comp.video (UHF output optional)	£93.00

ALL SP UNITS SUPPLIED IN PLASTIC CASE WITH POWER SUPPLY UNIT AND CABLES

Satellite Modules

UNI 3A	TRANSCODER. SECAM video input, PAL video out	£123.10
UNI 5	INTERFACE. PAL video in, RGB plus synchro out	£84.00
UNI 5	TRANSCODER. PAL video in, SECAM video out	£123.10

SATELLITE MODULES REQUIRE 12v DC supply, approx 200mA

Other modules for adapting TV's or videos available on request. Quantity discounts available. All prices are inclusive of carriage. For further details contact the sole U.K. distributor:-

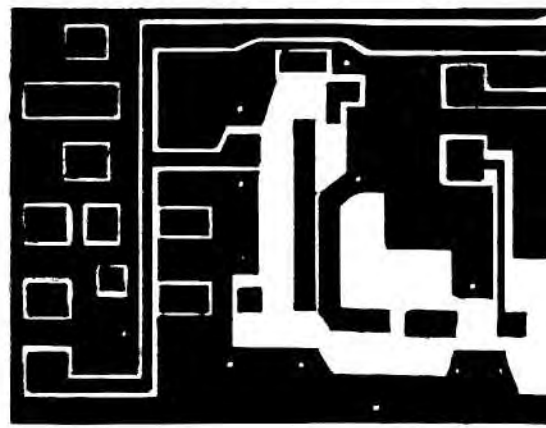
THOMSON ELECTRONICS

Basement Office, 5 David Place,
St.Helier, Jersey, Channel Islands.
Tel: (0534) 75170

IN RETROSPECT

24cm FM-TV TRANSMITTER - CQ-TV133

Fig.2a (actual size 55 x 72mm)



Further to the piece in last issue's column which described a new oscillator for this project, I am now able to provide you with the additional information regarding the printed circuit board.

Although the circuit of the new oscillator appeared last time, Peter has now sent me another version which has some changes on it. The changes are mainly to do with the buffer amplifier and this latest circuit is shown in Fig.1.

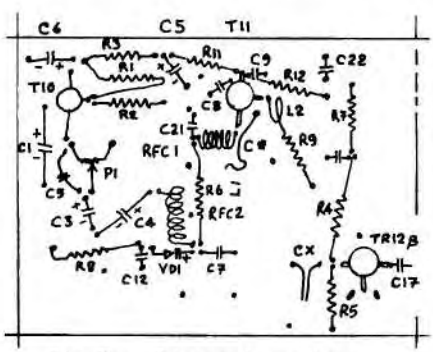


Fig.2b Component overlay

The oscillator and buffer may be built separately and appended to the original PCB-4, so Fig.2 shows the printed circuit layout and component overlay for that version. Fig.3 shows the printed pattern and overlay for the latest version of the combined PCB-3 and 4.

Is it me or is this all getting a little complicated? Ah well, let's hope that this sees the design in its final form, although either Peter or myself would be pleased to hear any further suggestions etc. from constructors.

8-WAY VISION SWITCHER - BATC Handbook-2 and REVISED VERSION.

Under some conditions the logic control signals may be affected by those to another nearby card - particularly if the control wires pass down a multicore cable. To cure this tie the clock line (from the logic board) to ground via a 1k resistor from the 74LS75 (pins 4 & 13) and decouple the IC's supply pin (5) with a 10n capacitor. Both parts should be wired direct to the pins on the back of the board. (The IC concerned is the one on the far left of the matrix board circuit diagram).

There is sometimes a tendency for part of the video distribution amplifier to exhibit some instability. If you find this problem try wiring a small capacitor (around 10pF) across the 10k 'gain adj.' pot, this should stop it.

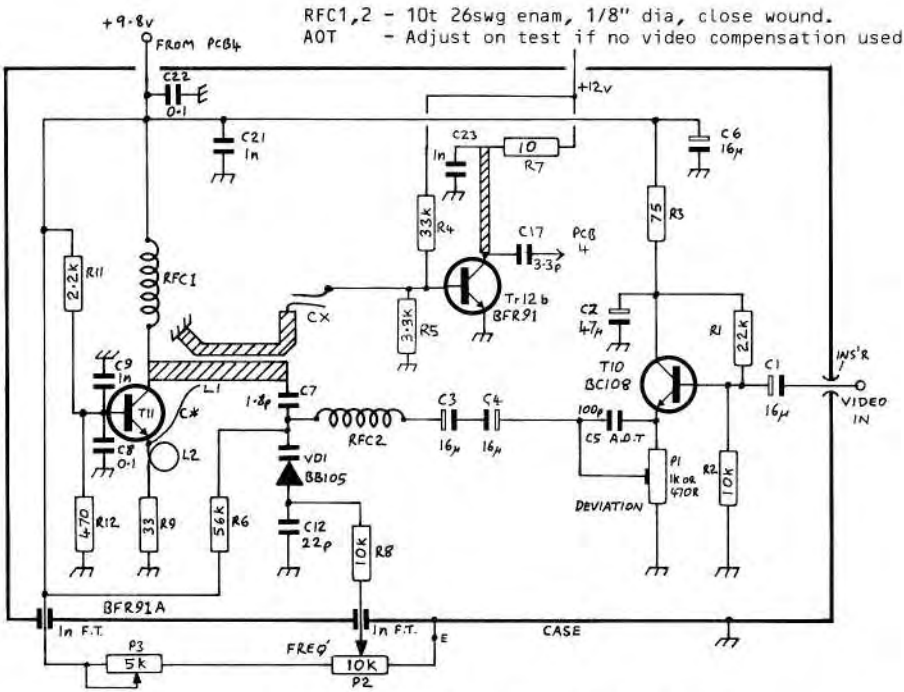


Fig.1 PCB3 - Oscillator, Buffer, Video modulator

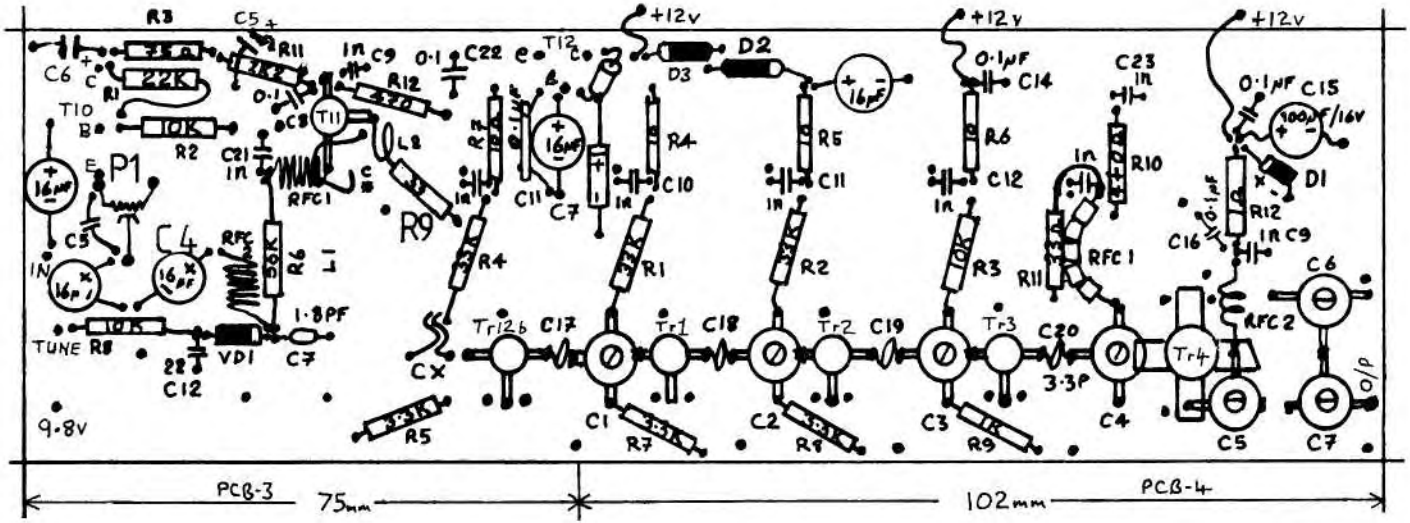
Narrow Bandwidth TeleVision Association

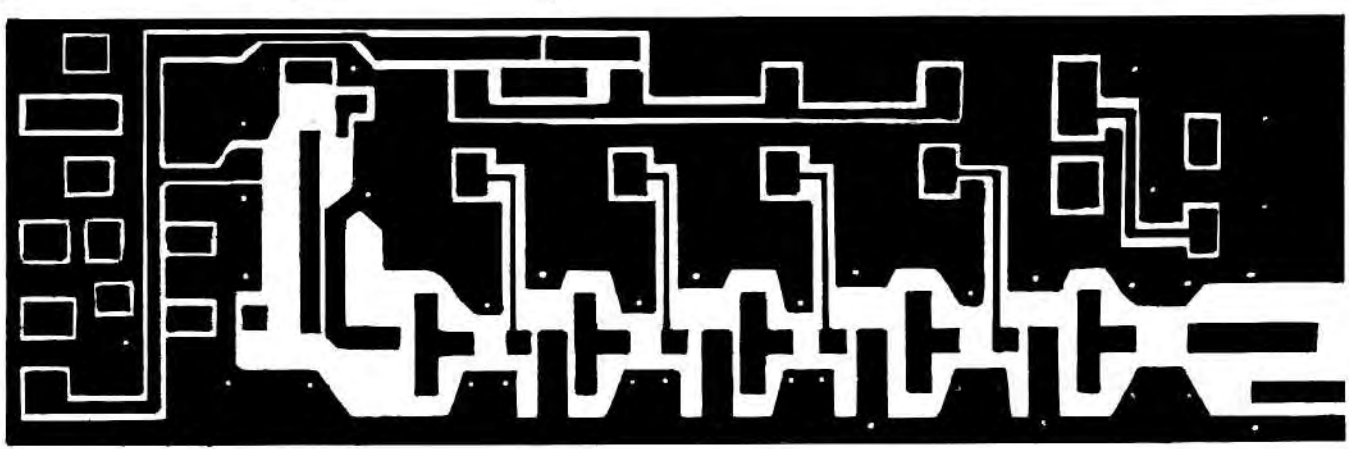
The NBTVA, founded in 1975, specialises in the mechanical and low definition aspects of ATV and offers genuine (moving) TV within a basic bandwidth of 6 - 7KHz.

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 newsletters, together with other services.

For further details write to: Doug Pitt, 1 Burnwood Drive, Wollaton, Nottingham, NG8 2DJ or telephone Nottingham (0602) 282896.


+12v
D2
D3
R3
C5
C6
R1
22K
R11
C9
0·1
C22
T12
T10
T11
R2
10K
C21
RFC1
L2
R12
R9
R7
C11
C7
R4
C10
R5
C14
R6
C12
C23
R10
C15
100μF/16v
D1
P1
C4
C8
L1
R8
VD1
1·8PF
C12
TUNE
9·8v
IN
Tr12b
C17
Tr1
C18
Tr2
C19
Tr3
C20
3·3P
Tr4
RFC2
C16
C6
C1
C2
C3
C4
C5
C7
R1
R2
R3
R4
R5
R7
R8
R9
R11
R12
CX
o/p
PCB-3
75mm
102mm
PCB-4



A TV-DXERS HANDBOOK

A new publication for TV DXers has recently been announced by Bernard Babani (publishing) Ltd., well known for their huge range of electronics, radio and computer books. "A TV-DXers Handbook" is written by our old friend Roger Bunney, who has for many years been central in the field of TV DXing.

The book itself represents a departure from the familiar small format and this new style, measuring 265 x 195mm is bound in a handsome full-colour cover, making it instantly recognisable on bookshelves.

The contents of the book are comprehensive indeed. The first chapter deals with the basic television signal and details the parameters of various world TV standards. A complete frequency list is given detailing the various systems to be found in bands 1, 2, 3 VHF and 4 & 5 UHF. A description of the various modes of signal propogation explains how different propogation phenomena effects the reception of television pictures, particularly over long distances. Several photographic examples illustrate the text.

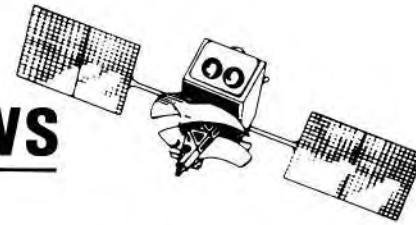
There is a good deal of technical material detailing circuits of receivers, tuners, power supplies, amplifiers, IF strips, sound demodulators, selectivity filters, switching, demodulation and signal distribution. All the circuits are well tried and tested (some came from CQ-TV) and can therefore be relied upon to work correctly. A full discussion of such topics as reception, colour, video recording, satellite TV, photography, interference, amateur TV and aerials, in which chapter there appears several good 'do-it-yourself' designs, is included with many illustrations and lots of practical advice.

I particularly liked the comprehensive reference sections, invaluable to any TV DXer and satellite enthusiast, and the easy to read, flowing style in which it is written. The book gives the impression of being comprehensive without getting bogged down in too much detail, preferring, as it does, to stick to the 'meat' of the subject and deal with each topic in a practical way. This volume should therefore appeal to old hands and newcomers alike.

A total of 88 pages makes up the book, although, due to the use of a fairly coarse thick paper, it seems at first glance to be larger. The paper used however does not reflect the light as do some books which is a considerable plus in its favour. I'm not so sure about the binding though. It is just a square glued edge and my copy is already coming apart after only a few hours use. Nevertheless, for £5.95 the "TV-DXers Handbook" is good value and will find a ready place on many bookshelves. The book may be obtained from bookshops and some radio/electronics shops or direct from the publisher (don't forget to add adequate postage)

Members may also like to know that a catalogue, detailing all the Babani publications, is available, free of charge, from Bernard Babani (publishing) Ltd., The Grampions, Shepherds Bush Road, London W6 7NF.

SATELLITE TV NEWS



by Charlie Suckling G3WDG

Satellite TV watchers will no doubt have noticed the demise of the EUROPA channel on Eutelsat-1. Its transponder is now occupied by the German channel 3SAT, which used to be on the east spot beam. Now 3SAT is much stronger!

On the brighter side, a new British channel should be starting up at the end of January. This is SUPERCHANNEL, which is to timeshare with MUSIC BOX on that channel's transponder. SUPERCHANNEL is being billed as a mix of the "best of British TV" and rumours are that it will not be scrambled, but will be financed by advertising.

After several false starts it now seems that DBS may happen after all in the U.K. A new consortium has been formed under the IBA to have the responsibility for getting DBS off the ground (sorry). I have not seen any technical information yet, but it seems likely that the MAC system will be used, and that the proposed film channel will be scrambled. Transmissions will almost certainly take place in the 11.7 - 12.5GHz band and so we will all need new LNB's as well as MAC decoding boxes.

TVRO MODULES

Apologies for any confusion which may have arisen concerning the "Matsushita" modules mentioned in my article last time. These modules should have been attributed to MITSUMI.

OTHER SATELLITES

In my last column I asked for your observations on what has been seen on satellites other than Intelsat V at 27.5W and Eutelsat 1. Thanks to those who have responded - I am still compiling the list, so would appreciate any more info. Satellites to look out for would seem to be Intelsats at 24.5W, 34.5W, 18.5W, 1W and 60E, and Eutelsat 2 at 7E. Several correspondents have reported that the satellite at 60E is carrying several German regular broadcasting channels, in the lower band (10.95 - 11.2). Unfortunately at the writer's location this satellite is hidden below the houses!

Finding all these satellites is no problem for those who are using polar mounts, but if you are using an el-az mount then it is very useful to be able to determine their elevation and azimuth. The following program in BASIC should help. Just modify lines 240 and 250 for your location. Satellite longitudes should be entered as positive numbers for westerly satellites (eg 27.5W is just 27.5), while easterly satellites are negative (eg 60E is -60).

Examples:

Elevation and azimuth of a satellite at 27.5W from location 52N, 1W is elevation 25.6 and azimuth 22.31. For a satellite at 60E elevation is 8.78 and azimuth 113.6. By the way, this program was not written by myself but was copied from some long lost magazine, so many thanks to the original author!!

Please send your correspondence on satellite TV matters to: 46 Windsor Close, Towcester, Northants NN12 7JB. Tel: (0327) 52100

```
200  REM  GEOSTATIONARY SATELLITE LOCATOR
240 L = 52.00: REM  YOUR LATITUDE IN DECIMAL DEGREES (N+, S-)
250 G = 1.00: REM  YOUR LONGITUDE IN DECIMAL DEGREES (W+, E-)
260 P1 = 3.14159265
300  INPUT "SATELLITE LONGITUDE (DEG. W)? ";C
350  HOME
360  PRINT "GEOSTATIONARY SATELLITE AT ";C;"W"
370  PRINT
380  PRINT "STATION LOCATED AT ";L;"N ";G;"W"
390 L = L * P1 / 180
400 G = G * P1 / 180
410 C = C * P1 / 180
440 Z =  ABS (C - G)
450  IF Z > P1 THEN Z =  ABS (2 * P1 - Z)
460 D =  COS (L) *  COS (Z)
470 D =  -  ATN (D /  SQR ( - D * D + 1)) + P1 / 2
480  IF D > 1.41895 THEN  GOTO 640
490 J = ( -  SIN (L) *  COS (D)) / ( COS (L) *  SIN (D))
500  IF  ABS (J) > .9999 THEN J = ( SGN (J)) * .9999
540 AZ = ( -  ATN (J /  SQR ( - J * J + 1)) + P1 / 2) * 57.3
550  IF C > G AND C < (P1 + G) OR C > (2 * P1 + G) THEN AZ = 36
    0 - AZ
560 E = (P1 / 2 - ( ATN (42171 *  SIN (D) / (42171 *  COS (D) -
    6371)))) * 57.3
565 AZ =  INT (AZ * 100) / 100
566 E =  INT (E * 100) / 100
570  PRINT "AZIMUTH= ";AZ;"  ELEVATION= ";E
600  GOTO 650
640  PRINT "SATELLITE BELOW HORIZON, SORRY"
650  END
```

A 10G TRANSCEIVER

By Henry O'Tani, G8OTA

Editor's Note

Although this article is in many ways similar to one which appeared in CQ-TV136, it has been included because of the high level of interest currently shown in 10GHz TV. It may be necessary to refer to last issue's article for further information.

Mike Wooding

BASIC MICROWAVE TRANSCEIVER

The block diagram in Fig.1 shows the basic layout of a simple Gunn diode microwave phone transceiver. This type of arrangement is quite easy to build and in use can realise contacts over a distance of 50 to 60km with only a 6dB horn aerial. The use of a dish aerial though can result in effective radiated powers in the order of 50W as well as a large increase in receive gain thus extending one's range considerably. However, by replacing the standard Gunn diode modulated power supply with an alternative unit and by providing a wideband FM IF system, a television transceiver is made possible; but with the capability of phone operation being retained.

MICROWAVE HEAD UNIT

I have tested two types of head unit in this application and I would think that most similar units will work satisfactorily, (it may be necessary to check the diode for supply polarity). The two I

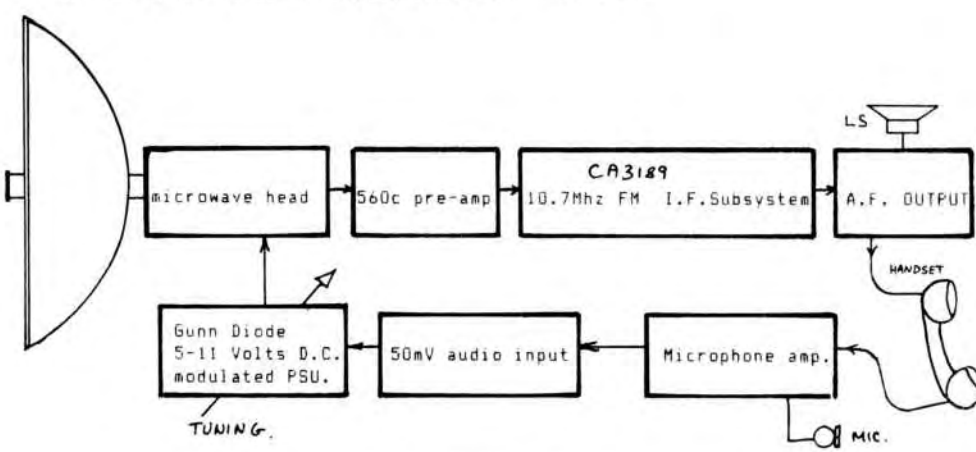


Fig 1 Basic microwave phone transceiver

tested are the Solfan Head (1) and the one supplied by the RSGB Microwave Society (2), both of which give excellent results. The head supplied by the Microwave Society is already tuned to 10.4GHz, but the Solfan head (and probably most others) will be set to about 11GHz and will require retuning to 10.4GHz or thereabouts. (For details of how to retune these head units refer to CQ-TV136).

The Solfan head unit comes with a standard square WG16 waveguide flange already fitted, to which is connected a horn aerial. The horn can be removed and a short length of waveguide used to attach a dish and appropriate feed. A suitable feed system for dish aerials having an F/D ratio 0.25-3 is the 'Penny' feed (see Fig.2) and a kit of parts is available from the Microwave Society. This type of feed is quite easy to construct oneself and requires a minimum of marking out or metalworking skills, the mechanical limits set on the dimensions being within the capabilities of most amateurs. A slot of appropriate dimensions is carefully filed in the end of a length of WG16 waveguide and a copper or brass flat disc (again of the correct diameter), which may be around 16swg, is soldered to the end. Be careful to remove excess solder from the slot. With very pronounced concave dishes (ie: dishes with a low F/D ratio) a 'penny' feed gives good and repeatable results. More detailed information on the penny feed may be found in ref.3.

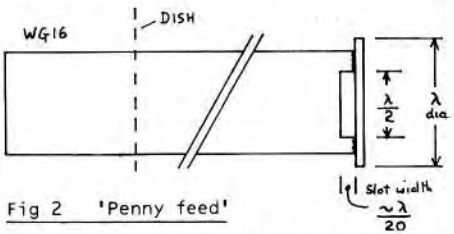


Fig 2 'Penny feed'

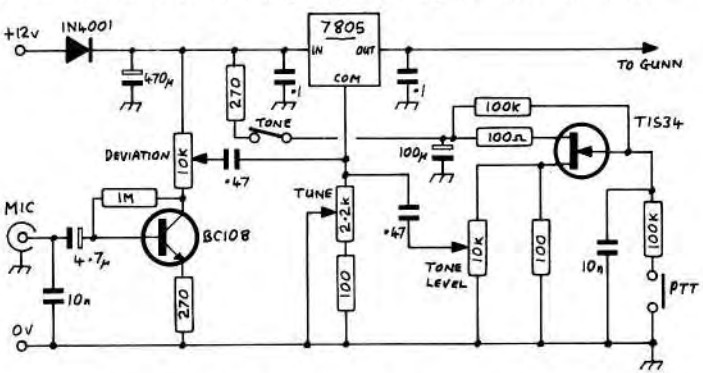


Fig.3 Gunn supply and phone only modulator

For detailed information on dishes, feeds and general microwave techniques you should consider obtaining a copy of the RSGB's 'VHF UHF Manual' by G.R.Jessop. You will find this volume invaluable.

TRANSCEIVER CIRCUITS

Fig.3 illustrates a typical Gunn power supply together with internal tone and external microphone modulation and is shown as an example only. Compare this with the circuit of Fig.4 which is a combined video and phone modulated power supply. The circuit includes a regulated supply of approximately 5v which allows portable use with power inputs between 11.5 and 16v. The fine tuning arrangement, utilising a multi-turn potentiometer, is retained allowing

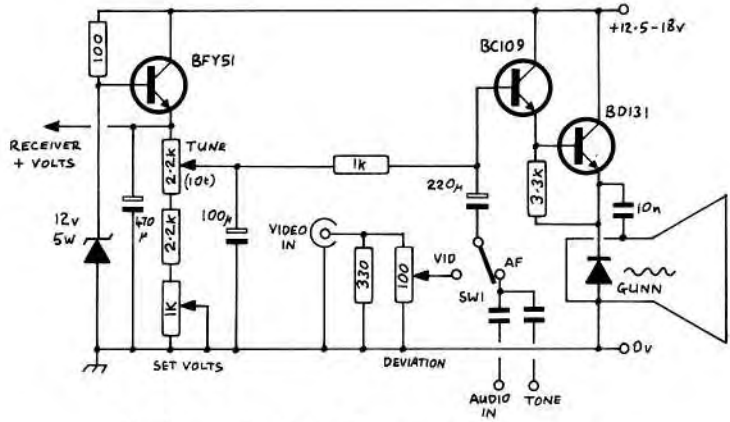


Fig.4 Combined ATV and phone modulator

accurate netting of the carrier. Video input is at the standard 1v p-p level and is terminated in approximately 75-ohms. The 100-ohm carbon potentiometer acts as a video deviation control and the maximum video deviation that can be achieved with this system is of the order of 50MHz, more than enough for our needs. If pre-emphasis is required then the circuit in Fig.5 may be added at the video input to the modulator. Of course intercarrier sound can be used and this is usually mixed with the composite video before it enters the modulator. A suitable module is the TVSG1, available from Wood & Douglas.

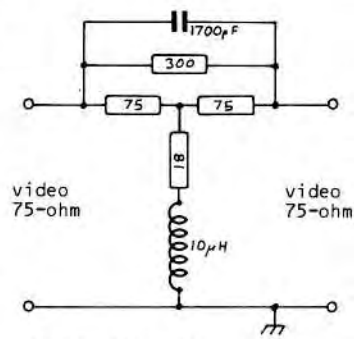


Fig.5 Video pre-emphasis

RECEIVER

The audio IF sub-system (3 - p9.49) is not used for video so a separate IF is required if a dual transceiver is required. A suitable IF and demodulator is described in CQ-TV 122 (p6) and also in 'The Best of CQ-TV' (p16) for which a PC board is available from Members Services. This circuit features a 6MHz sound take-off, video de-emphasis (which can be made switchable), a video invert facility and a video output of 1v p/p across 75-ohms. An alternative IF board is the Wood & Douglas VID-IF. The wideband low-noise IF pre-amplifier (see Fig.6) used in the original phone transceiver can be retained for video but it may be advisable to check operation without it as the input stages of the video demodulator are quite sensitive.

CONSTRUCTION

The complete transceiver can be split into two sections:

1) - The IF assemblies for phone and video, the audio amplifier, microphone amplifier and the switching etc.
2) - The aerial (dish or horn) and head assembly including the Gunn diode modulator and the IF pre-amplifier.

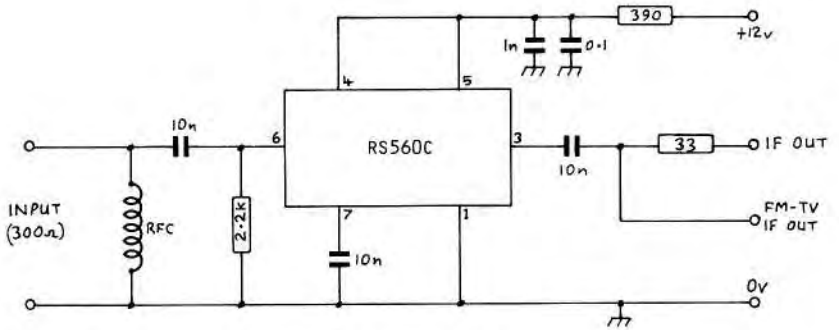


Fig.6 Wideband IF pre-amplifier

Fig.7 illustrates a method of combining the boards in section-1 into one cabinet, with all the necessary input and output connections. The front panel layout I used is shown in Fig.8 which, as you can see, was for a dual-mode transceiver. Fig.9 shows how the head unit may be mounted in a diecast box (120 x 95 x 55mm is suitable if the Solfan head is being used) which leaves

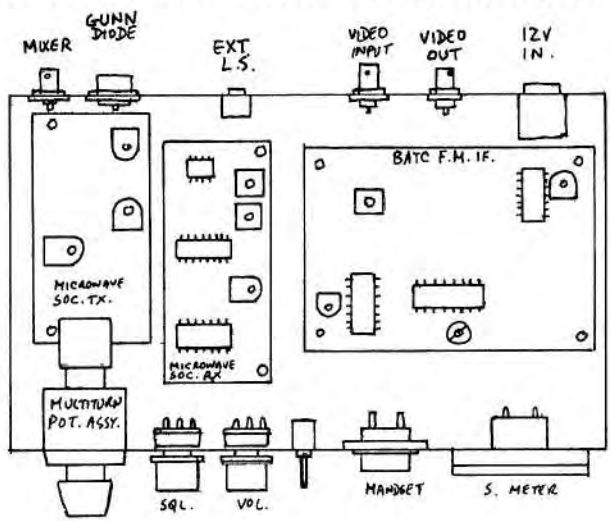
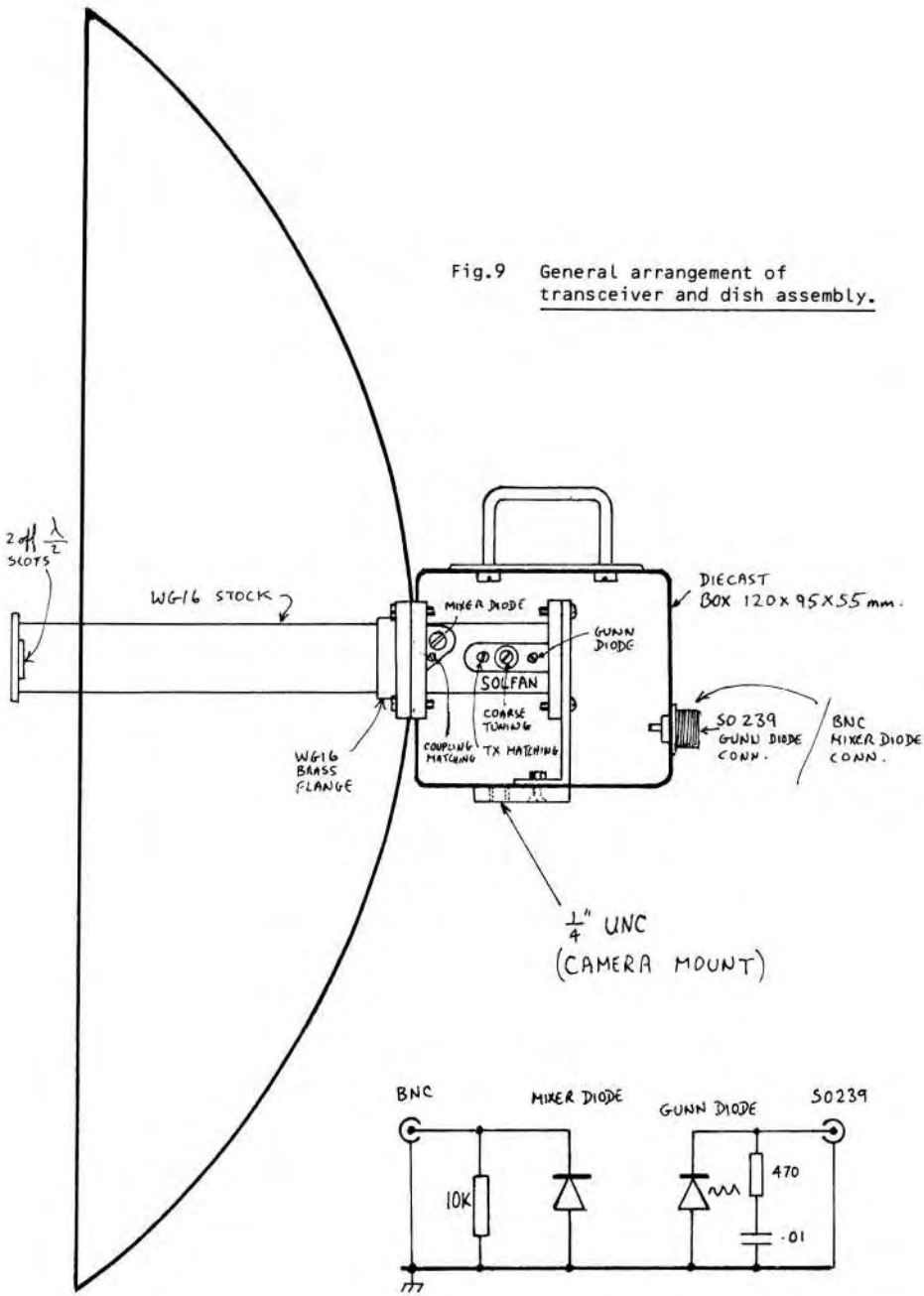


Fig.7 Internal layout

sufficient space to mount the modulator and pre-amplifier boards. The connections to the Gunn and mixer diodes are also shown in Fig.9 and the components associated with the diodes should be mounted as close to them as possible. Also shown is a method for mounting the whole unit onto a dish aerial, such as the 18-inch one available from the Microwave Society.

A photograph of the complete unit shows an 18-inch parabolic reflector and head unit mounted on a photographic tripod with a pan and tilt head. Alongside the tripod is the control unit and IF systems.

Fig.9 General arrangement of transceiver and dish assembly.



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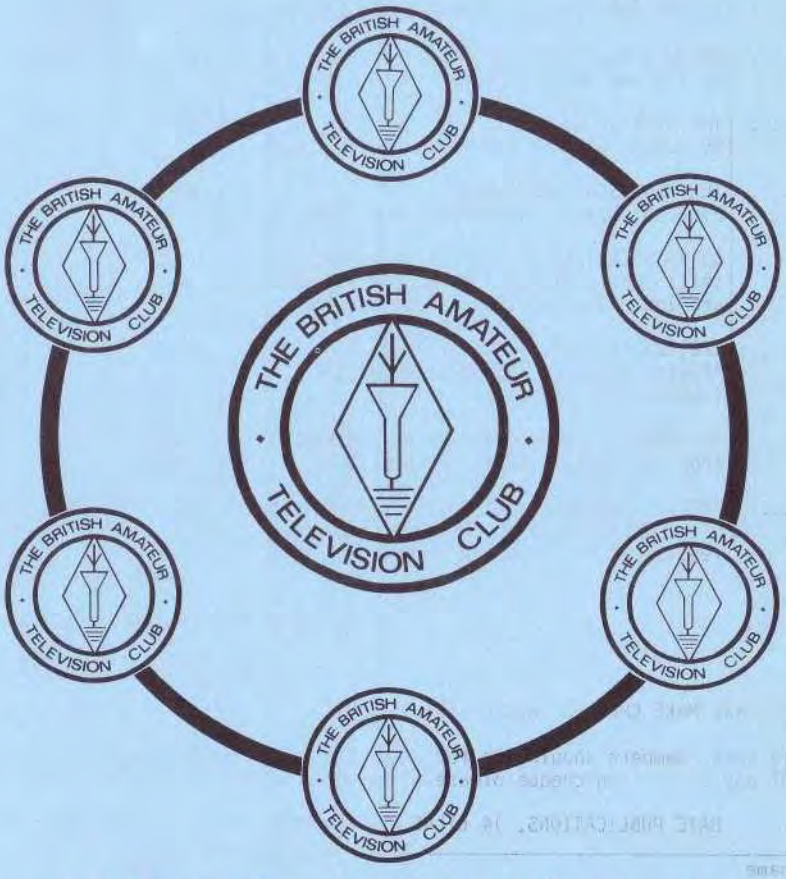

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THE WORTHING AND DISTRICT VIDEO REPEATER GROUP

BATC TYPE

TEXT

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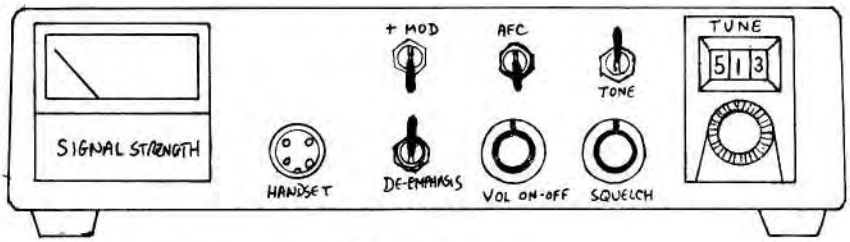


Fig.8 Front panel layout

References:

(1) Solfan heads are available from T.Wraith, 33 Colebrook Road, Swindon (0793 826335) at £16 inc VAT.

(2) The Microwave Society, 81 Ringwood Highway, Coventry, CV2 2GT.

(3) VHF/UHF Manual - 4th Edition by G.R.Jessop, G6JP, p9.49 (RSGB)

WHERE ON 10GHZ?

Due to the recent interest in operating ATV in the 10GHz band, it is becoming increasingly important that members restrict their transmissions to an appropriate part of the band. The reason for this, of course, is so that we do not cause interference to other band users. Also TV amateurs will know where to find each other.

The BATC's Technical Liason Committee is, at present, addressing itself to this requirement and will make recommendations to BATC members as soon as full consultations have taken place. Meanwhile members are advised to keep their activities within the frequencies laid down in the bandplan shown here.

The following letter on this subject has been received at CQ-TV, which seeks to explain the current position with regard to 10GHz working:

'Reference G4WTV's article on 10GHz ATV in CQ-TV 136, concerning the use of frequencies for TV in the amateur band. I must point out that his recommended use of 10.4GHz is neither correct, nor likely to be acceptable to other band users: especially since the amateur status at 10GHz is secondary. It is also out-of-line with the "current usage" bandplan and practices for the following reasons:-

1. 10.4GHz +/- is a designated wideband beacon sub-band.

2. Under /P conditions particularly there is a probability of ATV interference to the internationally used weak-signal sub-band at 10.368 to

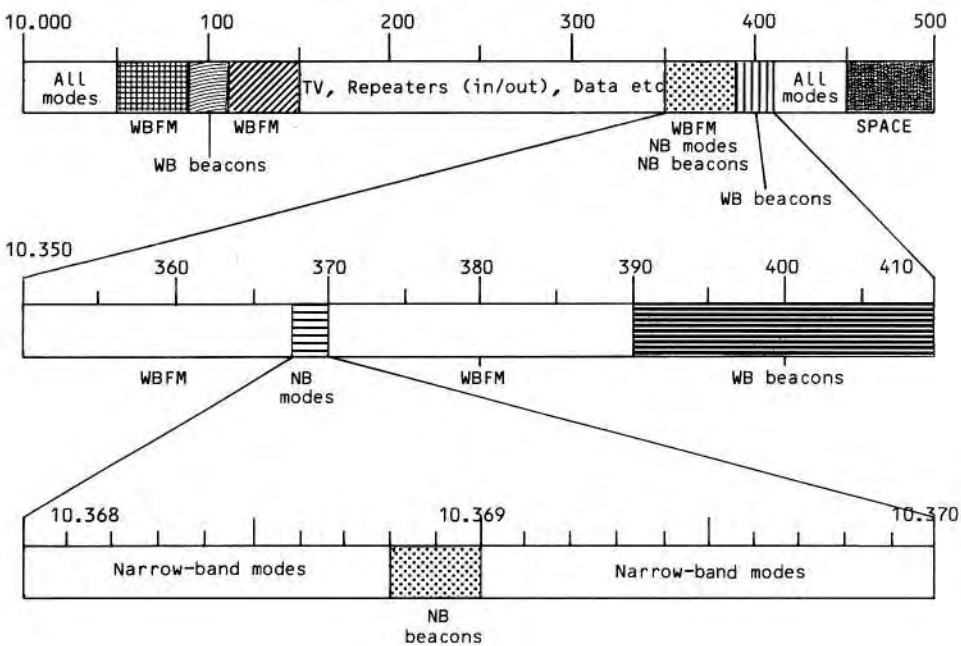
10.370GHz. This sub-band also carries international narrowband beacons (10.368 to 10.369GHz) which we know to be professionally monitored for propogation research. The possibility of interference is compounded by the highly inaccurate method of frequency setting suggested in the article and by the fact that the Gunn tunable range is considerable.

3. There is an international space sub-band at 10.450 to 10.500GHz. This also could suffer interference from a poorly set-up ATV transmitter with inaccurate frequency setting.

4. Most 10GHz activity, of which the RSGB Microwave Committee is aware, is currently centred on 10.250GHz and this is the area designated (recommended) for wideband modes such as TV and possibly repeater input/output, repeater linking and similar purposes. I should add that the whole question of frequency allocations and usage is under review following recommendations of the merriman Report and, thus, subject to scrutiny by the relevant government departments. We would not recommend any departure from these guidlines.

I enclose a copy of the "bandplan" and trust that this information will be of use to members contemplating ATV operation on the 10GHz band'.

Mike Dixon, G3PFR
Chairman, RSGB Microwave Committee.



10GHz "BANDPLAN" - Common usage plan

CONTESTING IN GWENT

By Eric Edwards, GW8LJJ

It was September and the International ATV contest was approaching. The Gwent ATV Group (GW8OOJ) had awakened from its five year sleep and decided to enter!

FRIDAY 12th (evening)

I left Barry (Barry Glamorgan that is) with Jo, the junior computer operator, in the estate car loaded to the gunnels with radio gear, cans of beer and half a cow (unfortunately the sherry had to be left out - no room). After leaving Jo at his parents I went to the local watering hole in Blackwood to meet with Mike GW4JKV and discuss the arrangements. Ray GW8GKF arrives from Caerphilly with the news that the linear wouldn't run off the generator as the HT dropped by 1kv. Winn GW8UAM arrived at the watering hole and found that it was his round. Discussion was now in full flood concerning the lost 1kv and Saturday's departure time from Mike's QTH. Keith GW8TRO arrived to join the discussion and, you guessed it, bought a round. Many suggestions were made concerning the linear and eventually a departure time agreed as well.

SATURDAY 13th

Saturday morning started well enough but all was soon on the decline when I received a phone call from Mike telling me that he had trouble with the van. However, Mike reckoned that it would be ready by 11am and that he would then collect the aerials from Blackwood Radio Club. I drove to Mike's to meet Ray at 10.30 as Mike would not be there. Keith was to meet us later at the site (I hope you're paying attention, I may ask questions later!). After an agonising wait Mike finally arrived with the van and aerials, we loaded the rest of the gear on board and set off on our intrepid journey to the mountain - no sign of Keith. At this point what was left of the still reasonable Saturday trickled down the gutter as the rain came, and came, and came, and kept coming! By the time we arrived on the mountain 30 miles away in a convoy of three vehicles a gale was blowing, this made erecting the tent interesting. Keith GWOARK arrived just in time to assemble the aerials and, with Winn, managed to get them up. I loaded all the radio gear, beer, and food into the tent and Jo set up the barbecue. Now you may be wondering how you start a barbecue and keep it going in a force-9 gale and rain? Easy. Inside the tent! Then the moment arrived, the mast was up, the gear was assembled and connected, so with everything crossed the generators were started. Mysteriously everything worked, so we all assembled in the tent soaked to the skin and, looking at each other, wondered "what on earth are we doing up here?".

After we had changed into dry (sorry drier) clothes and had a beer things didn't look quite so bad. After another beer they looked distinctly good, if not a little hazy. Pangs of hunger had by this time set in so the barbecue was duly loaded with king size steaks, immediately things got very hazy and we realised that the beer was a little strong.

The magic hour of 6pm arrived and on the air we went - still no sign of Keith 'TRO. Everything was working fine and the contacts were going well, it was still raining (inside as well as out) and the barbecue continued to emit copious amounts of smoke. It was argued at this point that Bob GW8AGI was perhaps in the best place after all, holidaying in Yugoslavia! but a few more beers put things in a different light. Working conditions slowly deteriorated as the night wore on, mostly as a consequence of the beer, until at 3.30am we closed down, the band having gone quiet.

SUNDAY 14th

We awoke at 7.30am to find that Keith 'TRO still hadn't arrived but, HALLELUJA! it had stopped raining. The barbecue was restarted, still inside the tent, well it seemed a shame to disturb it, the gear fired up and off we went again. The first contact of the morning got us all standing to attention, our leader Mike G6IQM and the Editor (in chief) G3YQC at 8.20am. Things got very hectic again with lots of stations, beer and steaks, until we worked our last station G8PX in Oxford at 11.45am. Keith 'TRO arrived just in time to help strip everything down, well done Keith!

AFTERTHOUGHTS

All things considered a very enjoyable weekend and a very good contest. We must admit to being 'naughty' twice, on one contact we gave a few video shots in and around the tent. On the other occasion we transmitted colour on 70cm, apologies but we got carried away and had to be reminded on the air that we were in a contest and air space was precious. We had problems with the 24cm receiver which refused to function, but as the gear was all home-brew we reckon that we did allright scoring 5977 on 70cm.

Congratulations to all who took part, we hope that you enjoyed it as much as we did and hope to see you again next year.

SSTV ON THE BEEB

Part-1

By the Rev. R.P.Butcher

EDITORS - This article appeared originally in RAMTOP, a private publication which concerned itself with applications for microcomputers in amateur radio. The magazine is alas no longer produced however we should like to express our thanks to Rev.Butcher for permission to reproduce this article in CQ-TV.

The program which follows is not going to pose a serious threat to the technical prominence of the BBC or IBA! What it will do is allow you, for the modest outlay of less than £20 and 4 hours soldering and typing, to receive a slow-scan television picture and display it on your screen. Please don't regard this as a finished, professional program, it's an experiment using, as I shall explain, all sorts of compromises to produce a picture. Sacrifice any one of those compromises and you can improve the result greatly in one or more respects. I won't pretend that the results of the program are better than awful, but the pictures received are recognisable.

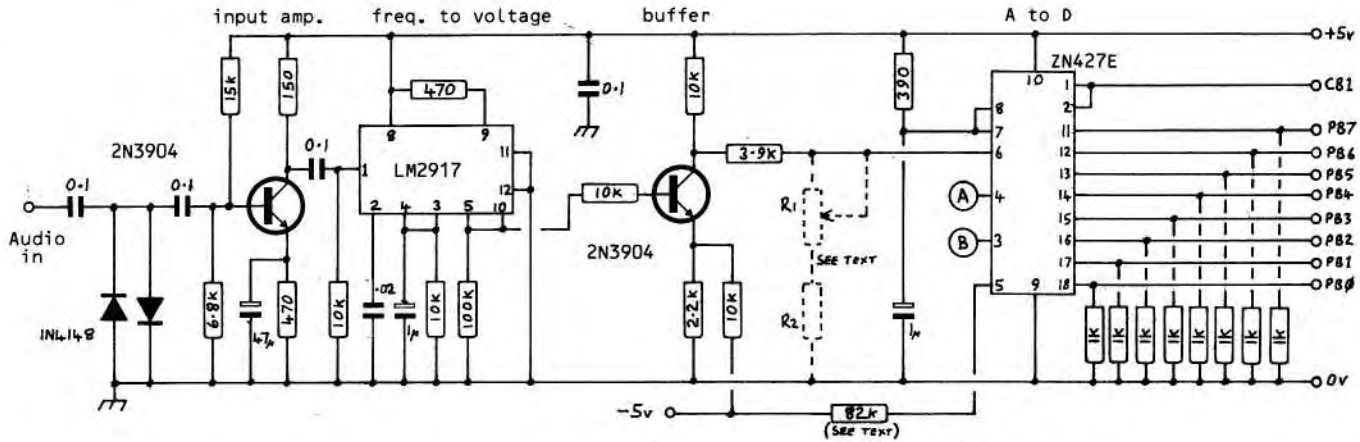
THE HARDWARE

I have no training in electronics above the modest demands of the RAE syllabus so, if you have, please don't mock the inadequacies of the circuit diagram in Fig.1, rather pick up a pen and give suggestions to modify it.

The upper half of Fig.1 represents a very simple digital frequency meter with a range of 500Hz to 2.5KHz. Audio is fed past a pair of limiting diodes to a simple one transistor amplifier and then into an LM2917 Frequency-to-Voltage (F-to-V) converter. The output of this is about 0.1V for an input of 300Hz and about 0.8V for an input of 3000Hz. This output passes through a buffer amplifier which converts (and inverts) the levels to about 2.2V for 300Hz and 0.2V for 2500Hz, (the remaining 500Hz up to 3000Hz do not seem to produce reliable results after the amplifier, but are not required for this project). I feel there should be some fine tuning available (hence the hint at R1 and R2 - e.g. 22-Kohms + 47-Kohms lin), but in the circuit I built the available voltage range appeared ideal for the Analogue-to-Digital (A-to-D) converter, the output of which is fed to the User Port.

It may be that someone with a bit more knowledge can suggest different values for the components around the LM2917 which would remove the need for the amplifier which follows it. This amplifier poses a small problem in that we need a -5V line to bias the transistor. Although this is available on the output socket of some computers (e.g. the BBC), with others it will be necessary to find a source of -5V from elsewhere; more of this below. Also I would welcome ideas for getting rid of the small but significant ripple on the input to the A-to-D converter.

The lower half of Fig.1 represents the clock system. A readily available 4.194304MHz crystal controls a simple oscillator circuit, fine tuned by the variable capacitor. The output of this oscillator is amplified and applied to a 74LS00 (Quad NAND Gate) which provides regulation at TTL level. The output of this first NAND gate is taken to a 74LS92, where the crystal frequency is first divided by 6 to produce 699050Hz which will do nicely as a clock frequency for the A-to-D converter. The same 74LS92 then divides this by



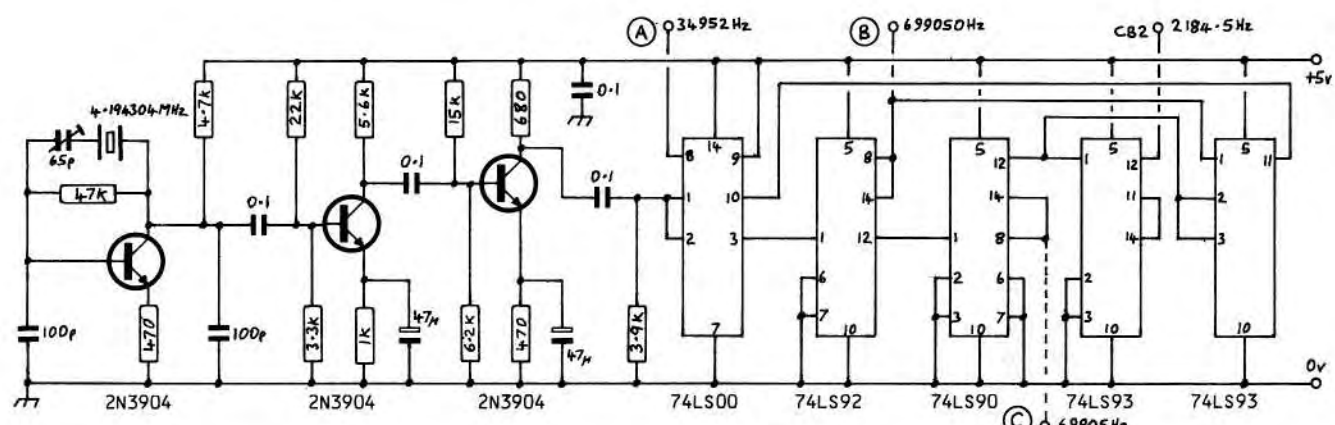


Fig.1 MAIN CIRCUIT DIAGRAM

2 (= 349525Hz) before feeding a signal to a 74LS90. Here a division by 5 takes place (= 69905Hz) and a further division by 2 (= 34952Hz). This signal in turn is fed to a 74LS93 (marked 'A' on the diagram) where it is divided by 16 to produce 2184.5Hz. We shall see the use of this later. The signal from the 74LS92 is also fed to a second 74LS93 where it is applied to the reset pins. This reset starts a count up to 8 of the 699050Hz output from the 74LS92 and the resulting pulse waveform is inverted by another quarter of the 74LS00 to provide a negative pulse to trigger the 'start conversion' on the A-to-D. The 'end conversion' is tied to the 'send data' pin and to the CB1 line.

The circuit shown in Fig.2 is a suggested 'diode pump' which might derive -5V from one of the frequencies in the timing chain (e.g. 69905HZ from pin-8 of the 74LS90). The 74LS chips will not source the power required by the buffer amplifier between the F-to-V and the A-to-D converters, so a further buffer is therefore required in front of the diode pump.

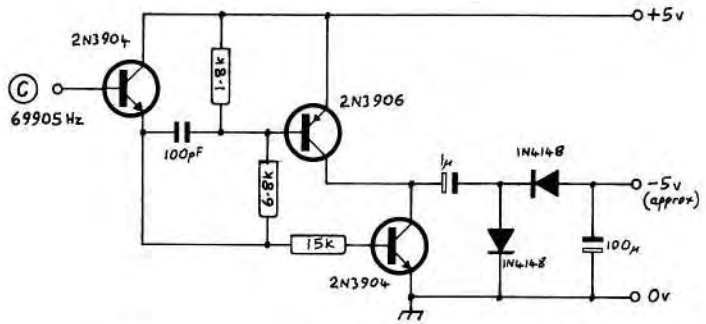
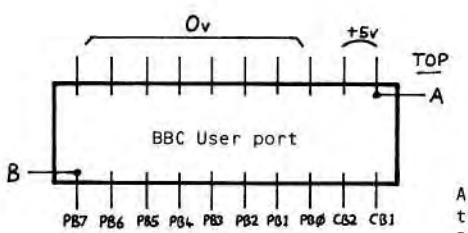


Fig.2 DIODE PUMP TO PROVIDE -5v SUPPLY



Looking into the BBC micro User Port.
NB. The diagram in "The Advanced User Guide" is wrong! (by 180 degrees)

A & B connect to the ends of the IDC header and ribbon cable.

SSTV

A Slow Scan TV frame begins with a synchronising tone of 1200Hz which is transmitted for 30mS. The information for the first line is then sent using tones ranging between 1500Hz for black and 2300Hz for white. The transmission of the line information takes 55ms, after which a 5mS sync tone is transmitted before the next line begins. In all 120 lines are sent for each frame.

THE SOFTWARE

We can divide the listing which follows into two sections:

1) Those parts that apply to any computer using a 6502 CPU
2) Those parts (marked with a line down the left hand margin) that apply only to this limited application on the BBC 'B'.

For anyone not familiar with assembler listings you must only type in what is in the left-hand column of each numbered line, the text on the right hand side is for explanation purposes only.

Lines 10 to 70 set up the BBC assembler

```
 10 MODE7                      only used for listing
 20 *KEY1|OLD|MRUN|M|          allows <BREAK> to be used to restart
 30 DIM CODE% 450              makes space for machine code
 40 FOR opt%=0 to 3 STEP3      two pass assembly
 50   P%=CODE%                 start address for machine code
 60   [                        assemble from here
 70   OPTopt%                  list errors second pass only
```

In this application we shall read 60 pairs of pixels from the audio onto the screen for each line of picture. The picture is 120 lines deep, so vertical and horizontal resolution will be the same. We work in pairs because the BBC Mode 2 display interlaces the code for two successive pixels into one screen memory location. Each pixel on the BBC screen is roughly twice as wide as it is deep, so we shall print each pixel twice on successive lines to make it appear square. Because of the way the screen addressing is organised we shall work in groups of four double lines. For further details reference should be made to 'The Advanced User Guide', page 467.

```
 80   .start                   code begins
 90   LDA #4                   for groups of four double lines
100   STA &70                  store 4 in a look-up location
110   LDA #30                  for 30 sets of such groups
120   STA &71                  store 30 in a look-up location
130   LDA #60                  for 60 pairs of pixels to the line
140   STA &73                  store 60 in a look-up location
```

The screen in Mode 2 begins at &3000 so:

```
150   LDA #&30                 store &30 (high order byte)
160   STA &81                  at a look-up location for each line
170   STA &87                  and at another for each group of 4 lines
180   LDA #0                   and do the same with the low order byte
190   STA &80                  in the line location
200   STA &86                  and the 4 line group location
```

We will now need to set up the registers. At the moment the Accumulator still contains 0 from line180. We can use this to set the User Port direction (DDRB).

```
210   STA &FE62                set DDRB to 0 (all lines input)
220   LDA #&50                 load up binary 01010000 and
230   ORA &FE6C                combine with the contents of the
                               Peripheral Control Register to set
                               CB1 and CB2 as inputs
240   STA &FE6C                and store the result in the PCR
```

We are now ready to get a frame into the computer. First we need to wait for the start. Assuming the tuning is correct, the sync tone (1200Hz) will generate a value of about 150 from the hardware frequency meter. Any tone below 1500Hz (black) ought to be a sync tone , so to catch some variation in tuning let's use a value of 130 (about 1350Hz). N.B. if we are tuned too low dark picture tones will sound like sync tones and this delay won't work.

```
250   .frame              a frame begins
260   LDA &FE60           reading port B clears the Interrupt
                          Flag Register
270   LDA #&10            binary 00010000 will check bit 4 of
                          the Interrupt Flag Register which will
                          be reset by CB1 going high
280   BIT &FE6D           this checks the bit
290   BEQ frame           and sends us back if it's not yet set
300   LDA &FE60           read port B and clear the IFR
310   CMP #130            subtract the value of about 1350Hz
320   BCC frame           go back if A (port value) <130
                          because a picture line is being sent
```

CB2 is being clocked by our hardware at 2184.5Hz, so about 11 pulses take the same time as a line sync (5mS). In case we've found a line sync, let's wait almost twice as long and then check the tone again.

```
330   LDX #20             set up for a delay of 20 pulses
340   .go2a               label a loop
350   JSR cb2wt           go to the subroutine which waits for
                          a CB2 pulse
360   DEX                 knock one off the counter
370   BNE  go2a           and go back if we're not counted out
```

Now we can check that the sync tone is still there. If not what we had found was a line sync and the line is now being transmitted. If there is still a sync tone we're all right to go on.

```
380   .wait2              label the loop
390   LDA #&10            set up the mask
400   BIT &FE6D           check CB1
410   BEQ wait2           go back if it's not high
420   LDA &FE60           read the port B value
430   CMP #130            see if it's a sync tone
440   BCC frame           go back if it isn't
```

Now all we need to do is wait for the sync tone to end, so that the first line of the picture can be read into the computer.

```
450   .wait3              we need a label
460   LDA#&10             and the mask
470   BIT &FE6D           to check CB1
480   BEQ wait3           and go back to the label if the IFR
                          has not detected CB1 going high
490   LDA &FE60           if it has we can read the data
```

I must digress for the BBC users: as you may know the BBC operating system depends heavily on interrupts. This means that just at a crucial point in a program like this the BBC will decide to pop out and update a timer, test the keyboard, telephone it's girlfriend or something. It's just possible that by the time it gets back the A-to-D will no longer be offering data, but will be holding all the Port B lines low, while it's working out the next value. This (and with our hardware, only this or a tone above the range we are interested in) will give a value of 0, for which we can test.

```
500   BEQ wait3          go back if 0.  Easily done!
510   CMP #130           now test for a sync tone
520   BCS wait3          and go back if we've got one
```

The first line has now started. I found that I sometimes got problems centering up a frame. Pictures look a bit funny with the line sync producing a black stripe down the middle of the screen! So I've introduced a delay before the reading of the first line, which can be varied until the left-hand edge (of the second and subsequent lines, I think) matches the left-hand edge of the screen.

```
530   LDX &78            get the delay counter from it's place
540   .centr             label the loop
550   LDA #&10           mask for IFR bit-4 (CB1)
560   BIT &FE6D          test IFR
570   BEQ centr          go back if CB1 not high
580   LDA &FE60          read the port only to clear the IFR
590   DEX                knock one off the counter
600   BNE centr          and go back if not counted out
```

The second and concluding part of this article will appear in the next issue of CQ-TV.

TELETRON/SPECTRUM LINK

By Trevor Brown, G8CJS

I have been spending some time lately linking a Spectrum computer into Teletron. The idea was to create a software development aid for Teletron by utilising a commercial assembler program in the Spectrum to write the software, thus making life a lot easier. The developed software could then be 'piped' down the link into Teletron's memory for testing.

I decided that the best way to link the two machines together, avoiding disturbing any specialist hardware operating via the other I/O ports, was to 'replace' the Teletron keyboard with the Spectrum. It then became apparent that a user port would have to be built as the Spectrum does not support one. The system finally chosen (Fig.1) was based on the Z80 PIO, as outlined in CQ-TV 130 page 47. The PIO is operated in Mode 0, the strobe pulse being taken from pin-21, BRDY, and the necessary inversion carried out by TR1. The system has only been operated to date with TRON 1, the teletype prom, fitted to the Teletron, but some interesting on-air animated captions have been created.

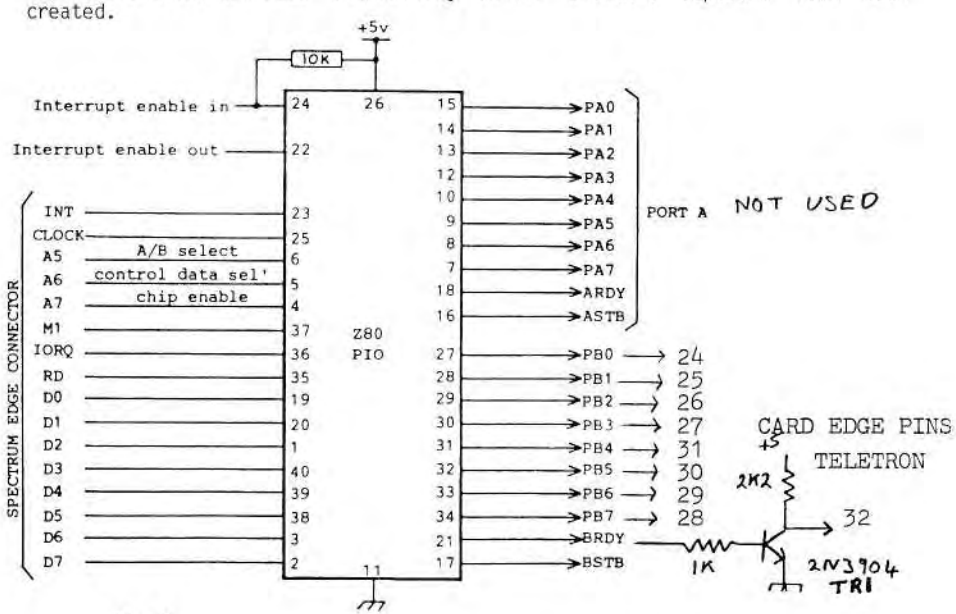


Fig.1

Two software programs have been used and are shown below, both have been written in Basic so that they can be customised to your requirements. The first program generates character screens by the use of data statements, line-20 should be adjusted to the length of the data statement in line-80. The pause in line-50 can be adjusted for effect. The numbers in the data statement represent the characters (see pages 138 & 139 of the Spectrum handbook), '267' is clear screen, '13' is line feed and '24' is cursor off.

The second program connects the Spectrum keyboard to Teletron to permit typing directly onto the screen, the following keys being given the functions shown:

```
SYMBOL SHIFT 'A' = CLEAR SCREEN
SYMBOL SHIFT 'S' = CLEAR SCREEN FROM CURSOR
SYMBOL SHIFT 'D' = CURSOR ON/OFF
SYMBOL SHIFT 'F' = REST SCREEN TO LOGO
DELETE           = BACK SPACE
EDIT             = LINE FEED
```

PROGRAM 1

```
5 REM G8CJS SCREEN WRITE
10 OUT 127,15
20 FOR a=1 TO 16
30 READ b
40 OUT 63,b
50 PAUSE 10
60 NEXT a
70 PAUSE 0
80 DATA 26,13,13,13,13,32,32,32,
        32,32,71,56,67,74,83,24
```

PROGRAM 2

```
1 REM G8CJS SPECTRUM/TELETRON
5 OUT 127,15
10 PAUSE 0
15 LET a$=INKEY$
20 LET b=CODE a$
25 IF b=12 THEN LET b=8
30 IF b=7 THEN LET b=10
35 IF b=195 THEN LET b=25
40 IF b=226 THEN LET b=26
45 IF b=205 THEN LET b=24
50 IF b=204 THEN LET b=3
55 IF b=0 THEN GO TO 10
60 OUT 63,b
70 GO TO 10
```

SPEECH UNIT

Additional hardware facilities can be used with Teletron via the PIA user socket located on the CPU board. One such addition could be the speech unit described below.

The circuit of the unit (Fig.2) revolves around the very cost effective Allophone chip: the SP0256. The number of external components is very low, comprising an external crystal clock and an audio amplifier. The only modifications required to Teletron are the linking of pins 10 to 11, 9 to 12, 8 to 13 and 7 to 14 on the CPU board. These will enable access to D0 through to D6 of port B, via the user socket.

The following program sets up the PIO Port B as an output and splits Port C into an upper (which becomes an input) and a lower (which becomes an output). The speech routine can then be called to service a look-up table, compiled from the Allophone list shown below, located in a convenient part of memory. Before calling the speech routine load the HL register with the look-up table start address and load the DE register with the size of the table. The speech routine is shown at 8000H, so that it can be typed in and developed with the aid of the Teletron Monitor program (TRON 2 Eprom), but it can be relocated elsewhere in memory should that be required.

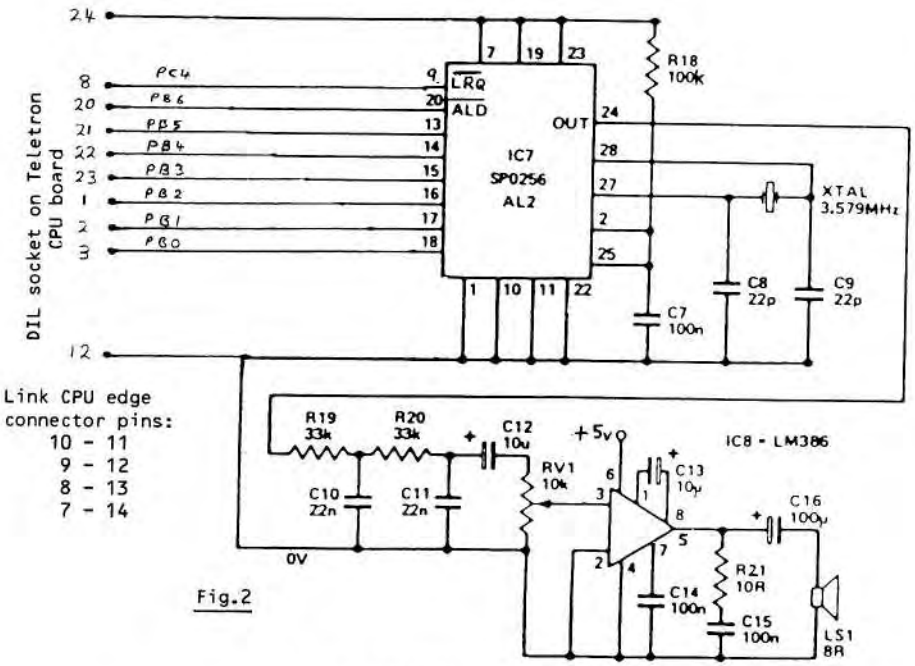


Fig.2

```
                        5 *H; TELETRON SPEECH SOFTWARE
8000                    10          ORG  #8000
0001                    15 PORT B   EQU  #0001
0002                    20 PORT C   EQU  #0002
8000 010300             25          LD   BC,#0003
8003 3E98               30          LD   A,#98
8005 ED79               35          OUT  (C),A      ;SET PORT
8007 010100             40 SPEAK    LD   BC,PORTB
800A 3E40               45          LD   A,#40      ;NO STROBE
800C ED79               50          OUT  (C),A      ;CLEAR PORTB
800E 010200             55 POLE     LD   BC,PORTC
8011 ED78               60 BUSY     IN   A,(C)
8013 E610               65          AND  #10        ;FIND STROBE
8015 20FA               70          JR   NZ,BUSY
8017 7E                 75          LD   A,(HL)
8018 010100             80          LD   BC,PORTB
801B ED79               85          OUT  (C),A      ;SEND DATA AND STROBE
801D 00                 90          NOP
801E 00                 95          NOP
801F 00                 100         NOP
8020 00                 105         NOP             ;STROBE LENGTH
8021 CBF7               110         SET  6,A        ;REMOVE STROBE
8023 ED79               115         OUT  (C),A
8025 23                 120         INC  HL         ;DATA ADDRESS
8026 1B                 125         DEC  DE         ;FILE LENGTH
8027 7A                 130         LD   A,D
8028 B3                 135         OR   E          ;CHECK FOR MORE DATA
8029 20E3               140         JR   NZ,POLE    ;GET DATA
802B C9                 145         RET
```

ALLOPHONE TABLE

00	PA1	(10mS)	use before stops and affricates
01	PA2	(30mS)	use before stops and affricates
02	PA3	(50mS)	use before voiceless stops and voiced fricatives, also between words
03	PA4	(100mS)	use between clauses and sentences
04	PA5	(200mS)	use between clauses and sentences

SHORT VOWELS
(these can be repeated)

07	EH	E	bend
0C	IH	I	fitting
0F	AX	U	succeed
17	AO	AU	caught
18	AA	O	cot
1A	AE	A	fat
1E	UH	OO	cook

LONG VOWELS

05	OY	OY	toy
06	AY	Y	sky
13	IY	E	see
14	EY	EA	great
16	UE	O	to
1F	UW2	OO	food
20	AW	OU	out
35	OW	OW	snow
3E	EL	L	angle

R COLOURED VOWELS

2F	XR	AI	hair
33	ER	ER	computer
34	ER2	IR	bird
3A	OR	OR	store
3B	AR	AR	farm
3C	YR	R	clear

RESONANTS

0E	RR	R	read
27	RR2	R	brain
31	YY	U	computer
19	YY2	Y	yes
2D	LL	L	luck
2E	WW	W	wool

AFFRICATES

0A	JH	J	jury
32	CH	CH	church

VOICED FRICATIVES

12	DH	TH	they
36	DH2	th	bathe
23	VV	V	even
2B	ZZ	Z	zoo
26	ZH	GE	beige

VOICELESS FRICATIVES

1D	TH	TH	thin
28	FF	F	fire
37	SS	S	sat

(1D, 28 & 37 double for initial positions)

1B	HH	H	he
39	HH2	H	hoe
25	SH	SH	shirt
30	WH	WH	whig

VOICED STOPS

1C	BB	B	rib
3f	BB2	B	big
15	DD	D	could
21	DD2	D	do
24	GG	GU	guest
3d	GG2	G	go
22	GG3	IG	wig

VOICELESS STOPS

11	T	T	it's
0D	TT2	T	to
2A	KK	C	computer
29	KK2	K	sky
08	KK3	C	crane
09	PP	P	pub

NASAL

10	MM	M	milk
0b	NN	N	earn
38	NN2	N	no
2c	NG	NG	bans

TELETRON EXTRA

By R.Holland G1AUH

The problem which led to this article was the need to provide a means of programming E-PROMS for such projects as Teletron, and the like. The reason was that the original projects software for the Spectrum E-PROM programmer, by Trevor Brown, was only capable of producing alpha numeric characters, but I wnated other things as well.

What I required was:-

1. To load any program into E-PROM.
2. To load from a storage medium, ie cassette.
3. To use existing hardware, ie the E-PROM programmer in 'Micro & TV Handbook'.

Below is the listing - just type in and save "NAME" line 100. On loading you will be prompted to select the E-PROM type (2716/2732). Once answered you are asked to load code from the cassette (this is the code which will be loaded into E-PROM). When loading into memory, it will display the name and the length of code. Once the loading is complete it will automaticaly load to the E-PROM and then tell you when it has finished. Please note that if the code is too long for the chip it will reset and ask you to load the code again.

```
1 DATA "31FFFF21F6D6E5E5E5E5E1E12100D7E521010711",3161
2 DATA "307501BC02F33E37ED4FED5FAE77EDA0E03B3BE8",2628
3 DATA "FBFA703866601E980C876423280 3B6197D113F53",1869
4 DATA "76D2F5D8B024FEBE30140B372034234F5B6F7C70",2214
5 DATA "6D6931244751294C4C52086C790512752021203F",1262
6 DATA "271C1675435C223F324138101 36C70690774 6B17",1245
7 DATA "001443390F716F2F1224273C75455B2F4F51313A",1171
8 DATA "261704070F7D6B7D05080F602614372C03554B1F",919
9 DATA "7F41414A342334111F00756D35181F1056F6DE93",1569
10 DATA "254AC5596755 9D6157F52A150F0BA34A5F577A65",1902
11 DATA "675B937AF2E00A964858F72A598E0CE8BFD48C20",2588
12 DATA "FAC23C05330C120E62316B494E4063393F044B16",1393
13 DATA "106D763D455D54262479170257636E7773464453",1521
14 DATA "6738351F005977657201 4E454D263E7D01031468",1230
15 DATA "2F6D425D526F65585296AE5C95660A342F967480",1949
16 DATA "411658875E9A640C7E473A4F4FB4D3A0D80CC696",2213
17 DATA "686A5C592271390900 1A682D63485F595A73737D",1579
18 DATA "47515B252F39030D3A4C0730310E07153DEEF66E",1335
19 DATA "B24E36889A4A46B89C24B437B746108444B421B7",2300
20 DATA "5976D634BC5EE203B866967318ABEC7BDAA25C38",2617
21 DATA "320A3C390251176A6E7D46491A03273A28001D1A",988
22 DATA "277F74520EC6EC9EE840C8029242836A59E24454",2384
23 DATA "677A7817C421F01E3C5182EEB97186446F7A128D",2316
24 DATA "17EC9E36F2CA24506A342B574054034F5B2E3C3B",1805
25 DATA "7F265D3629EE0341E2BA34405A350A051A297F72",1653
26 DATA "4655522B2879061F056E7935327D414467303C04",1290
27 DATA "06170EF2D4085D21375CA0B03897784231 1EF0D3",2037
28 DATA "ECBF54837FD93CC2C47A1EE4E2BA34405A222431",2601
29 DATA "3A2951516B7270651B162C4D3B4E45523F6F706F",1559
30 DATA "67140B3720340EF2DAA25C383244032F02020825",1274
```

```
 31 DATA "6E775A0D5C2432752B06530F62626F445D4DBCE2",1733
 32 DATA "8C9F8D6AA9163BEAFE106362969A5918967F28EB",2466
 33 DATA "E00130EA5FA6B2656F79030D37534E464B282129",1770
 34 DATA "98DE7B050F19232D373E6B07162A3852465F5F7C",1439
 35 DATA "0F71100E675045444D272B2B076715772C5A7367",1282
 36 DATA "23534A5B4C0907087E715B656F79030D17212B35",1214
 37 DATA "3F49535D67717B050F19232D37414B555F697370",1496
 38 DATA "070003100A0A5452414E532034353920000000000",664
100 CLEAR 49999: LET ad=55000: LET line=1: RESTORE : FOR
a=55000 TO 55740 STEP 20
110 LET count=0
120 PRINT "Address:";ad;" Line:";line;
130 READ a$: POKE 23692,255
140 FOR f=1 TO LEN a$ STEP 2
150 LET b$=a$(f)+a$(f+1)
160 LET h=0: FOR z=1 TO 2
170 LET h=h*16+CODE b$(z)-48-7*(b$(z)>"9"): NEXT z
180 POKE ad,h: LET count=count+h: LET ad=ad+1
190 NEXT f
200 READ y: PRINT " Count:";count: IF y<>count THEN PRINT
"ERROR IN LINE ";line : STOP
210 LET line=line+1: NEXT a
300 RANDOMIZE USR 55000
```

Anyone interested in this subject may like to note the display advertisement which appears after "Market Place".

NEW 1.3G AERIAL

The Bristol FM-TV Group has produced a new broadband 23/24cm ATV aerial. By utilising conventional band 4 and 5 technology, a compact and inexpensive "starter" or portable aerial has been produced which is now available to ATV'ers.

The aerial is an 18-element end-mounting Yagi having around 10dB gain. VSWR is about 1.5:1 across the band and the device measures 0.92m long and weighs 0.3kg. It comes complete with a mast clamp, suitable for stub masts up to 55mm diameter, and a waterproof terminal box. The aerial is supplied fully assembled apart from one screw which secures the reflector.

The unit is being professionally made for the group and is available only through them. All profits will go into group funding of GB3ZZ, Bristol's proposed ATV repeater.

The price is £12.50 if collected and £14.75 by post to a U.K. address. Cheques should be made payable to 'Bristol FM-TV Group' and orders sent to 15 Witney Close, Saltford, Bristol BS18 3DX. Up to 21-days should be allowed for delivery.

CQ-TV AWARD

This award is available to both transmitting and receiving enthusiasts, in any part of the world, whether they are members of the BATC or not.

The award is for contacts made using fast-scan high definition television systems only.

TRANSMITTING AWARD

For pictures transmitted which have been successfully identified by another station, claim 2-points per kilometer; if the contact becomes a successfull two-way exchange of pictures, then 10 bonus points may be claimed by each station regardless of distance. For contacts on the 1.3GHz band or above, points are doubled.

RECEIVING AWARD

For any picture positively identified - claim for a one-way contact. Otherwise rules are as for transmitting.

POINTS

The award is divided into five grades: For the Bronze - 1,000 points, for the Silver - 5,000 points, for the Gold - 10,000 points and for the Diamond - 100,000 points.

Points already gained for an existing award may be added in when applying for a higher grade.

CONTACTS

A station may be worked once only per day for the purpose of this award. It is quite possible for it to be gained by working the same station many times. Contacts through TV repeaters do not count.

THE AWARD

Upon qualification for the Bronze award, a certificate will be issued together with a Bronze seal; the certificate may be up-graded later with Silver and Gold seals. The Diamond award is in the form of a specially made trophy.

APPLICATIONS

Applications should include log details consisting of call sign, date of QSO, band, location of the station worked and points claimed. Contacts made from other than the home station should be clearly marked. QSL cards are not required, but the application should be checked and signed by either a licenced amateur or a BATC member.

CERTIFICATE APPLICATIONS SHOULD INCLUDE A LARGE (12" x 8.5") STAMPED ADDRESSED ENVELOPE. For upgrade seals an ordinary SAE should be enclosed.

Applications should be made to the Awards Manager: Mike Wooding G6IQM, 5 Ware Orchard, Barby, Nr. Rugby, CV23 8UF.

VIDEO ENHANCERS - DO THEY ALWAYS ENHANCE?

by John Goode

Ever since domestic video recorders have come into widespread use there have been devices offered that claim to 'improve' the reproduced picture, usually by either boosting the higher frequencies of the video signal, or by employing some form of edge crispening. This is normally achieved by differentiating the video twice, and from this a crispening signal corresponding to the sharp edges in the picture is derived, that can be added to the original video. A similar technique is employed in cameras with aperture correction, where the sharpening of picture transitions is used to compensate for the finite size of the electron-beam that scans the target.

Both of the above techniques are satisfactory provided their limitations are realised. In both cases the enhancement has side-effects; this is not the place to go deeply into the theory, but for reasons to do with phase-shift and group-delay, pre-shoot and over-shoot will occur, and their severity will increase with increase in enhancement. For those of you who are not familiar with these terms, they are manifested on the picture as a spurious line of opposite polarity either just to the left or right of vertical transitions. Thus, with overshoot a transition from white to black would be followed by a faint white line, and vice-versa. In severe cases more than one line can occur, and this phenomenon is known as "ringing".

So what's the problem? When you adjust the enhancer you can see the effect on the picture, and you can judge the point when the improvement in sharpness is outweighed by the other degredations. That's absolutely right, provided that the enhanced signal is then going to pass through a wide-band system. The problem occurs when the enhanced signal is then passed through a second bandwidth-limited system. And what's the most obvious second bandwidth-limited system? Why, a domestic videorecorder, of course! What I am saying is that enhancers are of very limited use when used for copying between domestic VCRs, despite the fact that most manufacturers claim this as one of their main functions! Whether this is ignorance, dishonesty, or the triumph of marketing over engineering I can't say; however, I suppose I had better explain further.

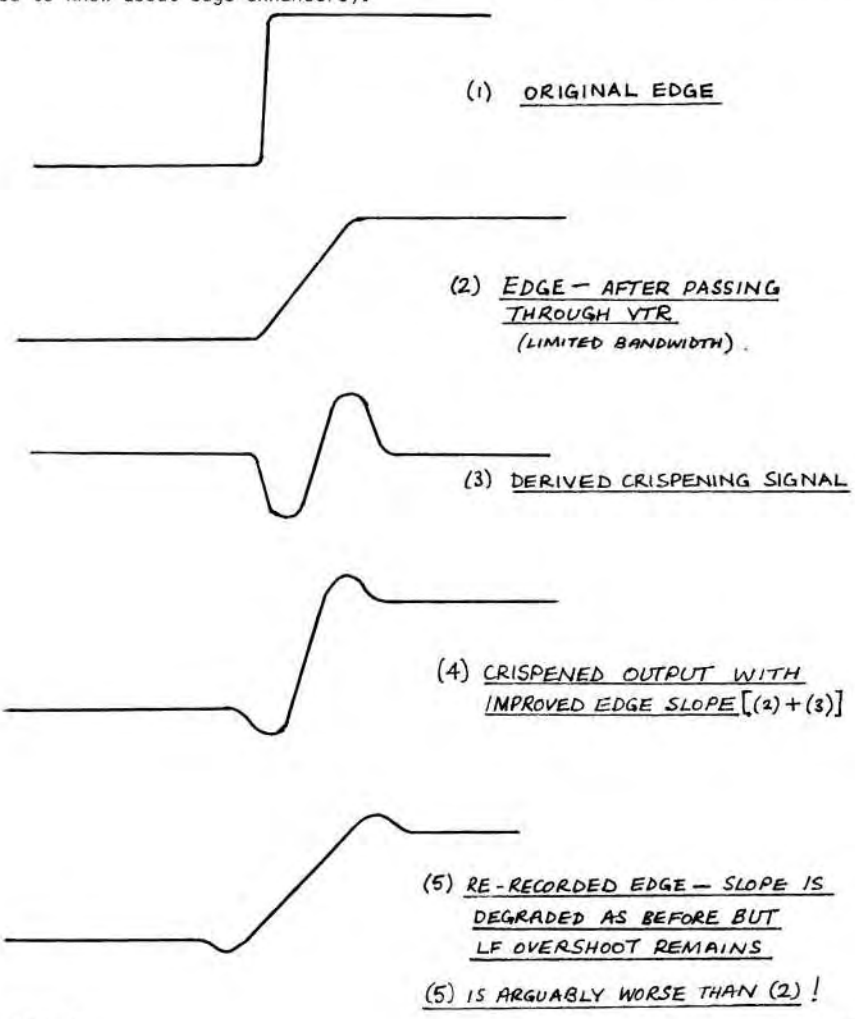
I can explain the problem by reference to Fig.1, that shows the effect of passing a sharp transition through a recorder, then replaying it with crispening and re-recording on a second machine. It's based on a drawing from "Videotape Recording" (Third Edition) by J.F.Robinson (Focal Press), probably the standard work on the subject. It is used to explain why enhancement should not be used when dubbing between High-Band U-Matics - so what goes for them must surely apply doubly to domestic machines!

Fig.1 (1) shows the original edge, which, after recording and replay through a limited bandwidth VCR appears (somewhat exaggerated) at (2). The derived crispening signal (3) is added, resulting in (4) an edge with improved slope but also with some inevitable overshoot. Nevertheless, the improved sharpness would probably make the overshoot tolerable, subjectively. Now the disappointing bit; applying the enhanced edge to a second record/replay process removes the improvement in slope (sharpness), but does not remove all of the overshoot (in fact, it tends to'spread' it). Thus we have no real

improvement in sharpness, and have simply added overshoot (and probably noisy transitions as well).

Summarising, then, it is best to think of enhancement as a replay function; fine if you have to show (say) a VHS recording on a large TV or a video projector. If it were really possible to improve recording quality in this way, don't you think that the Manufacturers would have done it? If you still feel that you can improve your dubbing by using enhancement (it's almost an intuitive feeling - it MUST be better!) then be cautious in its use - seeing the effect on E-E during record will not show the full degredation that tape playback will cause.

(REFERENCE:- Video Handbook by Ru Van Wezel (Newnes) will tell you all you need to know about edge enhancers).



SOLENT KITS ARE BACK

I know that many of you mourned the passing of Solent Scientific's 24cm ATV kits. For many they represented a first entry onto the band and, because they were well thought out, the kits generally gave little trouble to constructors. Of course there is now a lot of Solent equipment about and it could have made life difficult for some, facing the prospect of no spares and service backup. Fear not. The Worthing guys have come to the rescue and are now the official purveyors of Solent kits.

Allan Latham, G8CMQ, the originator of Solent Scientific, expressed concern about the potential loss of his designs to constructors and of the lack of product support for existing equipment. Accordingly Allan made it known that he would be willing to allow another organisation to market the kits and provide support, not only for new customers but for old ones as well. I believe that competition was quite fierce and I heard of at least five interested parties. In the end however, Allan decided that the Worthing Video Repeater Group was the kind of organisation he would feel happy about selling his kits, so they were awarded the rights.

THE PRESENT...

Of course the group only have limited funds at present and are thus unable to supply the entire range of kits which were previously available. To start off they have chosen to sell the two most popular lines; the 1W transmitter and the 24cm/UHF down converter. The converter will be exactly the same as the original although details of practical applications will also be provided to aid newcomers with their station receive systems. The transmitter will, again, be essentially the same as the original. But, because many past constructors have used incorrect mounting and boxing techniques and as a result have experienced problems, the kit will now include a correct size diecast box as well. I understand that the accompanying documentation is also to be re-written with perhaps some extra tips for constructors.

AND THE FUTURE...

Obviously a venture such as this must be taken one step at a time, and that is why there are only two products available as yet. However, if things progress satisfactorily, the group hope to add some or all of the other Solent products to their range. Although the Worthing Group is run voluntarily, profit from sales will (a) be ploughed back into the venture to allow a steady expansion and (b) will be used to support the GB3VR ATV repeater. It is hoped in the future to perhaps offer some material assistance to other ATV repeater groups and, as a start to that, a discount on five or more of any product will be given to repeater groups.

SERVICE AND SPARES

A full service and spares facility is available to aid anyone in difficulty. However, let's just remember one or two points:

1) This venture is run BY amateurs FOR amateurs. All work is done by members of the group in their own spare time so please don't always expect a super rapid turnround of equipment needing servicing. A little patience (if

required) would be greatly appreciated although I know that every effort will be made to satisfy customers speedily.

2) The Group is interested in helping amateurs and other ATV repeater groups, but they are NOT interested in supplying products to the trade.

3) Because of limited resources the Group will have to pay retail prices for most of their components, therefore prices at present are likely to remain largely the same as they were. However, if business increases, and it becomes possible to buy in larger quantities, it is likely that prices may be reduced in the future.

Let's hear it again for these Worthing lads who have, yet again, shown great enterprise, not only in creating funds for their own TV repeater, but also in putting a great deal back into the hobby by helping others with some of their more difficult and unusual products. May they reign supreme for a long time and provide a shining example to others. Look out for them at the BATC show in May, and see the advertisements in the centre section of this issue.

Robin Stevens, G8XEU, Treasurer and micro software.

Martin Newell G8KOE looks after all the RF equipment.

THE TEAM

Geoff Mather, G8DHE, computers and logic.

Roy Humphreys, G4WTV Secretary, admin, repeater keeper, aerials and all things mechanical

CIRCUIT NOTEBOOK

No. 44

by John Lawrence GW3JGA

This economy circuit, shown in Fig.1, will accept a standard 1 volt p-p colour video signal and will produce from it, mixed syncs with colour burst - 'black & burst'. The phase of the outgoing colour burst is adjustable, either side of the incoming burst phase, and can be set so that when the output is fed back into a simple colour mixer it is then possible to fade to black. The output can of course be used to synchronise other colour sources

CIRCUIT DESCRIPTION

Incoming video is buffered by the emitter follower TR1, the output of which feeds the sync separator IC1. IC1 is a fast comparator and it makes an ideal sync separator. D1 provides d.c. restoration and the clipping level is set by RV2. The mixed sync output is fed to the dual monostable IC2, the first half of which is triggered every line and removes the field sync signal. The second half provides an adjustable delay for the burst, which is set by RV4. The delayed output triggers the monostable IC3 which generates the burst gate pulse, the width being set by RV5.
Colour subcarrier is taken from TR1 through RV1, C4 and R6 to the tuned circuit L1 and C9. This circuit resonates at the subcarrier frequency and provides the adjustable phasing of the outgoing colour burst. The variable capacitor C9 is a small 2-gang plastic dielectric tuning capacitor (from an A.M. radio) with the two sections connected in parallel. The output from the tuned circuit is fed to one input of the video switch IC4 and mixed sync from RV3 is fed to the other. The burst gate pulse from IC3 passes through TR2 and, at the appropriate point, switches the subcarrier burst into the mixed sync

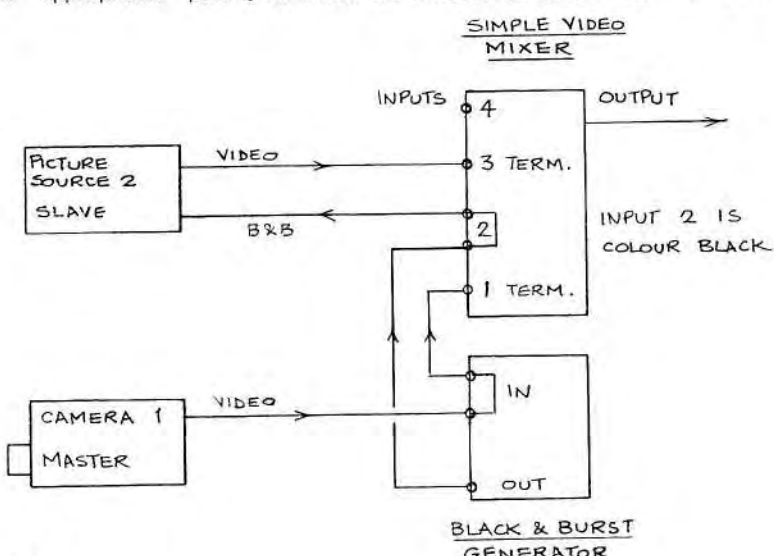


FIG. 2.

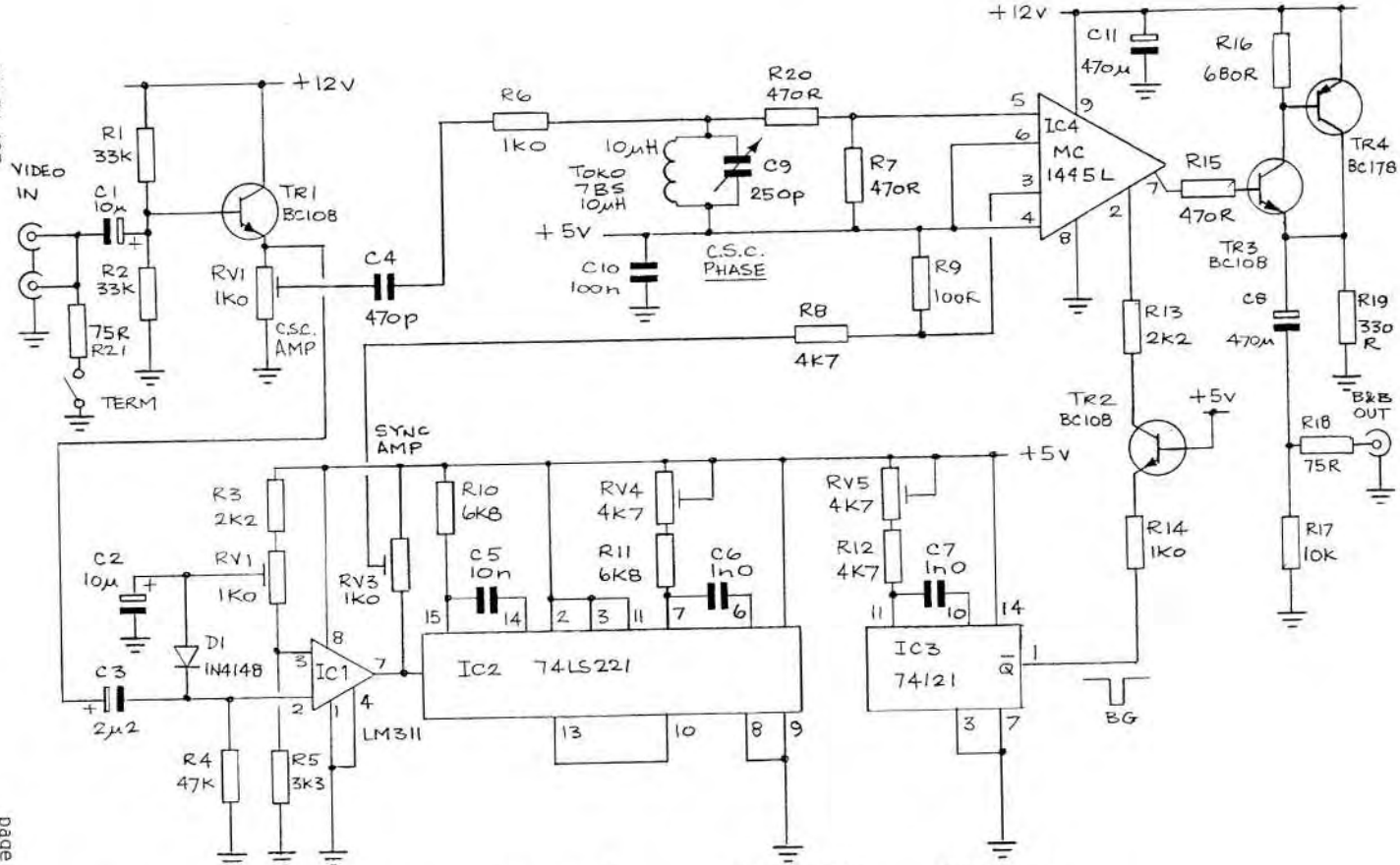


FIG. 1

BLACK & BURST GENERATOR

GW3JGA

signal to generate the 'black & burst' signal. The output of IC4 is fed to the amplifier pair TR3 and TR4 to provide a 0.3 volt p-p output into 75 ohms.

SETTING UP

Terminate the input with 75 ohms and feed in a colour video signal of 1 volt p-p. Connect a scope to IC1 pin 7 and adjust RV2 for clean syncs. Terminate the output with 75 ohms and connect the scope across the output. Adjust RV3 for 0.3 volt p-p syncs. Set RV1 to mid position, adjust RV4 and RV5 for correct position and duration of the burst. Adjust C9 for required burst phase - burst amplitude will vary with adjustment of phase, adjust RV1 for 0.3 volt p-p burst amplitude. Further adjustment may be obtained by slightly changing the values of R20 and R7. An application of 'black and burst' synchronising is shown in Fig.2.

AN FM-TV ARTICLE

Issue 3, 1986 VHF-Communications magazine includes a very informative article entitled 'Frequency Modulated Amateur Television (ATV), by Josef Grimm, DJ6PI.

The article starts out by explaining the principles of a television transmitter, describing at first a conventional AM system. This is well illustrated by photo's graphs and charts and delves quite deeply into the question of noise in the AM transmission system.

Frequency modulation is then explained in some depth covering such items as principles, bandwidth, noise, linearity, emphasis etc., and also shows some basic circuits to illustrate the text. Particular attention is paid to the improvement in FM of signal to noise ratio and the reasons for using pre/de-emphasis. Finally AM and FM TV are compared, highlighting some most interesting comparisons.

The article summary lists the following advantages of FM over AM TV:

'1. 20 to 25dB better signal/noise ratio by transmitters of equal strengths. This means, conversely, that the TV sender power using FM can be 20 to 25dB lower for the same received picture quality.
2. Simpler transmitter construction.
3. All stages in the transmitter may be driven at their full permissable power ratings.

The following disadvantages must be recorded:

1. A special receiver must be built for FM TV.
2. Higher bandwidth is required.

The advantages are overwhelming for the use of an FM system and those who are tired of receiving QRM plagued pictures on the 70cm band should switch to FM TV in the SHF bands'.

Finally a comprehensive reference section details a number of relevant articles and works on the subject, unfortunately most are probably in German. The same magazine also carries a most interesting constructional article on a tunable VHF to SHF bandpass filter which can be constructed to cover ranges between 100MHz and 26GHz.

SSTV - NEW STANDARDS FOR OLD MONITORS

By John Brown, G3LPB

SSTVers will surely know that there is more than one picture standard around these days. Typically 120, 128 and 256 line standards can be found regularly on the bands. Then of course there are several frame speeds as well: 8, 16 and 24-second periods being typical, and, for some of us, it all makes life rather difficult.

The problem lies not with the shiny digital boxes but with the older, more traditional SSTV monitors which use discrete components and a CRT for display. In particular I think of the popular Spacemark and G8CGK designs, so I have worked out some simple modifications to these to enable them to cope in this ever changing world. Of course the same principles may be applied to many of the other designs as well: Robot, Venus, W6MXV and perhaps even the G3RHI monitors could all be modified in a similar way.

SPACEMARK SSM1

Let's first deal with those line speeds. Fig.1 shows a new switching circuit which, when connected to terminal 6, will enable three line speeds to be received.

First remove all existing connections to P6. Mount a double-pole 3-way switch on the front panel and wire up the circuit as shown. The three controls are skeleton presets and these can be mounted on a small piece of Vero board, and fixed to any convenient point inside the cabinet. The controls should be set as follows: P1 for 120-lines, P2 for 128-lines and P3 for 256-lines.

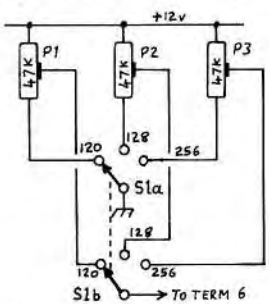


Fig.1 Line speed modification.

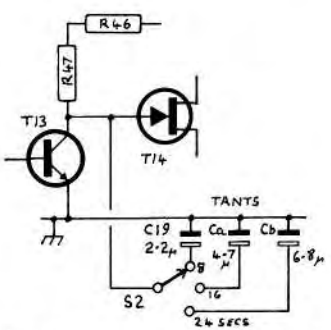


Fig.2 Frame rate modification

Now for the frame. Fig.2 shows a modified circuit of the existing frame timebase. Remove the existing C19 (2.2uF) and solder a wire to the junction of T13's collector and the gate of T14. Fit a single-pole 3-way switch onto the front panel and connect the new wire to the switch common. Now connect the three tantalum capacitors from the three terminals of the switch to ground, as shown in the diagram. This modification allows switching between 8, 16 and 24-second frame standards.

G8CGK MONITOR (or similar)

First the line timebase. Fig.3 shows the original speed circuit together with its switch for 60Hz standards. Remove the existing P13 (470-ohm) and P14 (5k) presets and the wires to the switch. Solder three wires as shown; one to the +12v line, one to the transistor base and one to the (now) free end of the 33k resistor.

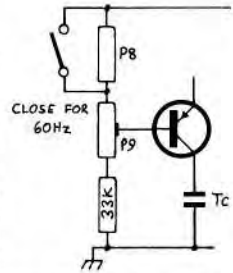


Fig.3a Original circuit

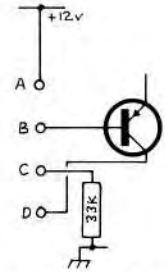


Fig.3b rewire like this

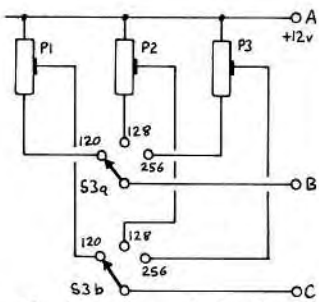


Fig.4 Line modification

Fit a double-pole 3-way switch to the front panel and connect the wires A, B and C to the positions shown. Mount three skeleton preset controls onto a small piece of Vero board and wire them to the switch as shown in Fig.4. With the switch set in the appropriate position the three line speeds may be adjusted by setting P1 for 120-lines, P2 for 128-lines and P3 for 256-lines. Unfortunately the 50/60Hz switch is lost but, in practice, this is not a problem.

In the existing frame timebase, remove both P8 and P9 presets and the existing timing capacitor Tc. Connect four wires to (A) +12v, (B) the base of the existing transistor (BC213), (C) to the (now) free end of the 33k resistor and (D) to the transistor's collector, (see Fig.5).

Now fit a 3-pole 3-way switch to the front panel. Mount three skeleton preset controls onto a small piece of Vero board and fix to a convenient point. Connect the four wires A, B, C and D to the three switch commons and to the new controls as shown in Fig.6. Now wire up S4a and b to the new control board and fit three new tantalum vapacitors to the third section of the new switch. When the switch is operated controls P1, P2 and P3 will now adjust to the three speeds required; A = 24-secs, B = 16-secs and C = 8-secs.

As you can see these modifications are all quite easy and, as suggested before, could be applied to most similar types of monitor. Of course all one is doing is

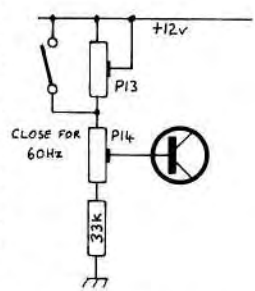


Fig.5a Original

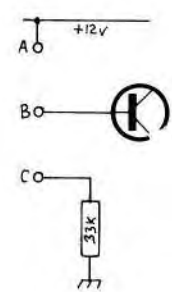


Fig.5b Rewire like this

altering the time constant for the various line and field rate oscillators.

A P7 phosphor tube only retains an image for a few seconds so you may find that you have to darken your room when viewing the 16 or 24 second frame speeds, otherwise the first part of the image will be invisible when the scan reaches the bottom of the frame.

As far as SSTV cameras are cocerned, they may not be quite so easy to convert. However, I'm sure that knowledgeable members have done such standards modifications, so perhaps a note or two in the mag? Probably the use of digital dividers would be most appropriate in cameras.

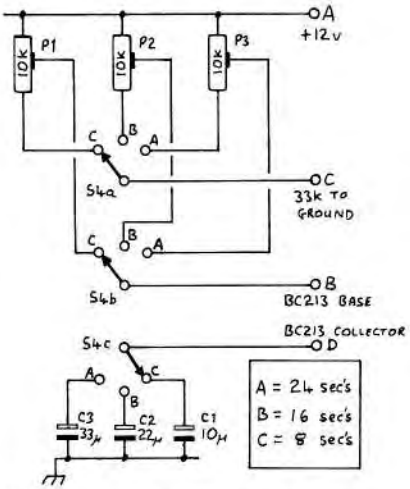


Fig.6 Frame modification

BATC PRESTEL

The BATC Prestel service is now one year old and we have steadily increased the number of frames over the past year from 17 to over 60, giving possibly the best information service to members using this particular medium.

The BATC database is intended to serve two main functions: (1) To make the latest up-to-date information quckly available to members and (2) To introduce the enthusiast to amateur television and explain it in a straightforward manner.

BATC frames can be found on page 8106262, which is within the ClubSpot 810 area of Prestel. ClubSpot 810 pages are administered by the Association of Computer Clubs (ACC) and have been allocated to them by Prestel.

In the past year there has been a considerable increase in Amateur Radio information on Prestel. The RSGB (8107), AMSAT UK (8106263) and BARTG (8106261) are all available to subscribers.

Don't forget that such a news and information service is only as good as the material supplied to it. Therefore, If you are involved in ATV group or club activities, please let us know so we can tell others.

Please address information for Prestel, or any ideas on improvements to the service, to Dave Lawton, 'Grenehurst', Pinewood Road, High Wycombe, Bucks HP12 4DD Tel: (0494) 28899 or on Prestel mailbox 049428899.

The combined Prestel/Micronet subscription is currently £16.50 a quarter. If you would like further details and an application form please send a large SAE to the above address. It is hoped that the next issue of CQ-TV will carry a feature on the service in general. This will also deal with the equipment required and how to operate in Prestel.

SOFTWARE NOTEBOOK

No.8

Two for the price of one this time! I am getting a little topped up with computer programs (don't stop sending them though) so I thought that two programs wouldn't come amiss.

WANT TO SEND A LISTING FOR THIS SPOT?

When sending listings for inclusion in CQ-TV, remember that, unless they are for the BBC micro, I will probably not be able to reproduce them. Therefore please make sure that the listings are printed using a decent ribbon and, if possible, double strike so that the characters print up clearly. Our magazine printer can't handle some of those feint matrix jobs on grotty paper so please do your best for me. If you can keep your line lengths (on the printed paper) to less than about 36 then I can paste up in two columns and thus save page space. (see the second listing as an example). It all saves work for the poor old editors and makes sure it is kept accurate as well - thanks.

Colour bars on the Beeb or Electron

by Bryan Dandy G4YPB

This little program produces standard colour bars across the screen, although the bottom part of the display is blanked off to enable a callsign or message to be inserted. The program will run on any BBC or Electron.

```
 10 MODE 2
 20 GCOL 0,129
 30 CLG
 40 DATA 7,3,6,2,5,1,4,0
 50 FOR I = 0 TO 1279 STEP 160
 60 READ A
 70 GCOL 0,A
 80 MOVE I,300
 90 MOVE I+160,300
100 PLOT 85,I,1023
110 PLOT 85,I+160,1023
120 NEXT
130 VDU 5
140 GCOL 0,7
150 MOVE 480,215
160 PRINT "G4YPB"
170 MOVE 416,165
180 PRINT "AMATEUR"
190 MOVE 320,115
200 PRINT "TELEVISION"
210 MOVE 100,-100
```

BATC logo - TRS-80

By J.Bramhill, G2BMI

This program for the (these days) seldom heard of TRS-80 prints the BATC logo on the screen.

```
  1REM B A T C LOGO-TRS80
  2 REM. PROGRAM BY G2BMI 1-8-86
  5 Y=4
 10 CLS:ON ERROR GOTO 90
 20 READ X1:IF X1<0 GOSUB 100:
    GOTO 20 ELSE READ X2
 30 FOR X=X1 TO X2:SET(X,Y):NEXT X
 40 GOTO 20
 90 GOTO 90
100 REM
110 Y=Y+1:RETURN
1040 DATA 59,60,-1
1050 DATA 58,61,-1
1060 DATA 57,58,61,62,-1
1070 DATA 56,57,62,63,-1
1080 DATA 55,56,63,64,-1
1090 DATA 54,55,64,65,-1
1100 DATA 53,54,59,60,65,66,-1
1110 DATA 52,53,56,56,59,60,
          63,63,66,67,-1
1120 DATA 51,52,57,57,59,60,
          62,62,67,68,-1
1130 DATA 50,51,58,61,68,69,-1
1140 DATA 49,50,59,60,69,70,-1
1150 DATA 48,49,52,67,70,71,-1
1160 DATA 47,48,53,53,66,66,
          71,72,-1
1170 DATA 46,47,54,54,65,65,
          72,73,-1
1180 DATA 45,46,55,55,64,64,
          73,74,-1
1190 DATA 44,45,56,56,63,63,
          74,75,-1
1200 DATA 12,19,32,33,43,44,
          56,57,62,63,75,76,
          82,91,96,103,-1
1210 DATA 12,13,18,19,30,34,
          42,43,56,57,62,63,
          76,77,86,87,96,97,
          102,103,-1
1220 DATA 12,13,18,19,29,30,
          34,35,41,42,56,57,
          62,63,77,78,86,87,
          96,97,-1
1230 DATA 12,21,28,29,35,36,
          40,41,56,57,62,63,
          78,79,86,87,96,97,
          -1
1240 DATA 12,13,20,21,27,37,
          41,42,56,57,62,63,
          77,78,86,87,96,97,
          -1
1250 DATA 12,13,20,21,26,27,
          37,38,42,43,56,57,
          62,63,76,77,86,87,
          96,97,102,103,-1
1260 DATA 12,13,20,21,25,26,
          38,39,43,44,56,57,
          62,63,75,76,96,103
          -1
1270 DATA 12,21,24,25,39,40,
          44,45,56,57,62,63,
          74,75,-1
1280 DATA 45,46,56,57,62,63,
          73,74,-1
1290 DATA 46,47,56,63,72,73,
          -1
1300 DATA 47,48,59,60,71,72,
          -1
1310 DATA 48,49,59,60,70,71,
          -1
1320 DATA 49,50,54,65,69,70,
          -1
1330 DATA 50,51,68,69,-1
1340 DATA 51,52,56,63,67,68,
          -1
1350 DATA 52,53,66,67,-1
1360 DATA 53,54,58,61,65,66,
          -1
1370 DATA 54,55,64,65,-1
1380 DATA 55,56,59,60,63,64,
          -1
1390 DATA 56,57,62,63,-1
1400 DATA 57,58,61,62,-1
1410 DATA 58,61,-1
1420 DATA 59,60,-1
```

A CURSOR FOR SSTV KEYBOARDS

By John Brown, G3LPB

Having built a slow-scan keyboard which is capable of transmitting two memories, each having four scans of thirty two characters, I decided that during the 'writing' period some indication of where I was at any time was required. A cursor circuit was built but found to be unsatisfactory in many respects, so I set about developing a simple counter circuit.

The unit consists of two independent counters; one indicating the line being transmitted and the other the character on that line. Two LED's are used to indicate which of the keyboard's memories are being read. The displays are common-anode 7-segment types, readily available from Electromail in a variety of sizes and colours. The display drivers used are standard TTL 7447 devices, chosen because they only require a 4-level binary input which is easily available from the keyboard timing chain. The circuit diagram is shown in Fig.1.

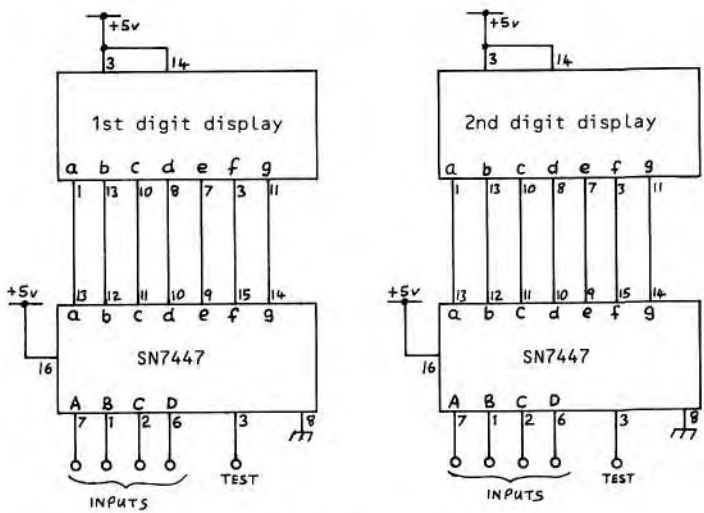


Fig.1 Display circuit diagram

A very simple technique was used for construction in that the sockets for the displays and drivers were stuck to a piece of plain board, (not copperclad) and the interconnections hard-wired across the back, the general layout is illustrated in Fig.1.

The inputs A,B & C for the drivers were taken from the frame division circuit for the character counter and from the line division circuit for the line counter. In both cases the D input was earthed. If the circuitry in your division circuits uses 7493 4-bit binary counters then the inputs are taken from:

A) - pin 9 7493
B) - pin 8 7493
C) - pin 11 7493

The displays may be tested by grounding pin-3 ('test') of the SN7447, in which case all the segments should light. The decimal points on the displays (pin-6) are not used in this application.

In use the counters flash at their own respective speeds and at any time it is easy to locate the current character being written-in from the keyboard. For example: if the line counter reads 2 and the frame counter 5, the character position 5 of line 2 is being written to.

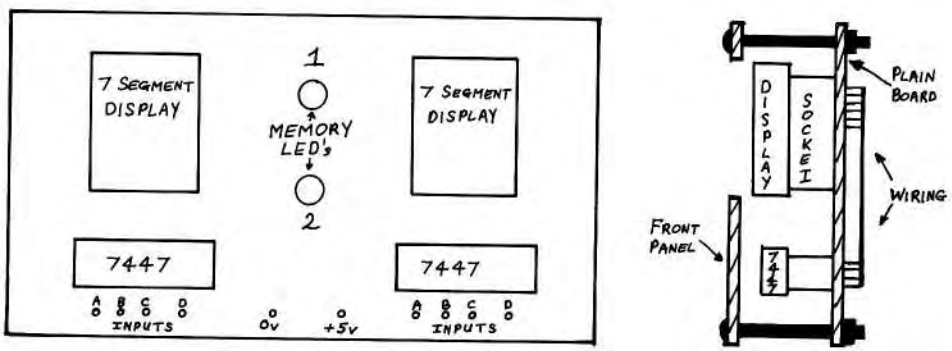


Fig.2 Suggested layout and mounting arrangement.

405-LINES?

Do you own or use any 625 to 405-line standards conversion equipment? The British Vintage Wireless Society is compiling a list of all users of converters so that we can form a self-help users group. We currently know of about eight systems owned by members and companies but would be pleased to hear about others.

We are also interested in 405 to 625-line conversion - does it exist anywhere outside the BBC? - and any remaining spares for converters that you might have sitting in your loft, garage or chicken house.

We hope to offer advice and help to all users. Please contact either: Jeffrey Borin at 50 Bonnersfield Lane, Harrow HA1 2LE (Tel: 01 863 2880) or: Gerald Wells, The Vintage Wireless Museum, 23 Rosendale Road, London SE21 (Tel: 01 670 3667)

IN FRONT OF THE TUBE

Part 5

By Peter Delaney, G8KZG

So far we have looked at the different types of lens that can be put in front of the television camera tube, (parts 1 & 2), at the systems used to separate the light into component colour signals, (part 3), and ways to create special effects optically, (part 4). Now it is time to consider providing sufficient and suitable light on the subject that we wish to shoot. Many modern television cameras are sensitive enough to produce a picture in normal room light, (especially the newer models in the high street shops which work down to 10 Lux). However, the picture can be rather 'flat' and unevenly lit, so additional lighting is usually beneficial.

All types of lamp produce a coloured illumination, even those that are nominally white. The description of temperatures by colour is familiar, such as a piece of metal being red-hot or white-hot. The reverse system is used to refer to the colouration of a light source. The 'colour temperature' is measured in degrees Kelvin, and typical values are:-

100W bulb	2900
Tungsten photoflood	3400
Fluorescent tube	4500
Daylight	6300
Cloudy sky	7000
Clear blue sky	10000

To compensate for these differing light sources, a filter is placed in front of the film or tube in a camera. Modern colour television cameras have this filter set built in as part of the white balance system.

In the theatre, of course, the lamps often have filters inserted, to change the colour to create a particular atmosphere - blue tones being 'cold' and red ones 'warm'. Unless this effect is wanted, we must be careful that the light source itself does not artificially colour the image being televised.

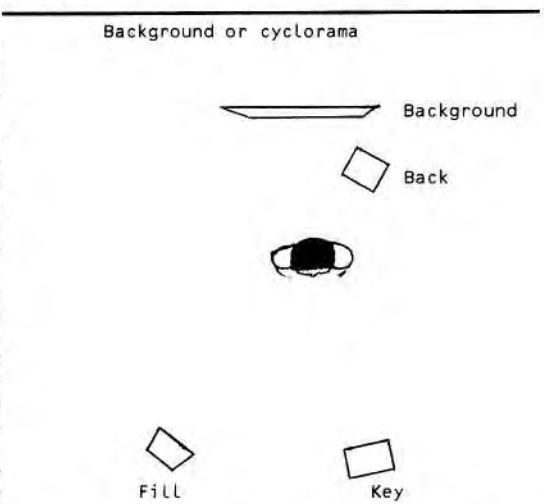
For many purposes the fluorescent tube might appear to be a good light source. It is cool running, and nearer to daylight than tungsten lamps in terms of colour temperature. However, a fluorescent lamp is normally several feet long, which means that it gives a very 'soft' (shadowless) light. Although hard shadows are normally to be avoided, making them too soft leaves the picture flat and featureless.

There are two types of lamp which are practical to use - incandescent or tungsten-halogen. The fittings, lamphousings etc are available for both, as they are used in amateur theatrical applications. The incandescent lamp is, of course, a larger version of the domestic light bulb. They can be fitted to small spotlights, but these tend to be relatively large. They are an inefficient light source, much of the energy being converted to heat. They also deteriorate with age, as the bulb gradually blackens, reducing the light output. Incandescent lamps are, however, relatively robust and inexpensive.

The tungsten-halogen lamp is physically much smaller. The tungsten filament is inside a quartz bulb, to allow for the high temperatures involved. The halogen gas, usually iodine, works to limit the rate at which the filament

evaporates, and actually helps to return some of the tungsten to the filament. As a result the bulb does not blacken with age, and produces a light that stays at about the same colour temperature throughout its working life. The bulb operates at high temperature - certainly far too hot to touch. As always, there is a penalty to pay: the tungsten halogen lamp costs around three times that of an incandescent equivalent. There is a warning to those who use the tungsten-halogen bulb, which is: "do not touch the bulb with your hand". The fluids in the skin affect the quartz, so that when it gets hot, the quartz will distort and the bulb fail. The correct way is to either insert the bulb with the paper or plastic packing in place removing the packing before use or to wear gloves. If the bulb is unfortunately touched then carefully clean it with methanol (some video head cleaning fluids are methanol), allowing it to dry naturally, before turning on, a careful wash in warm soapy water should also clean the bulb.

Incidentally, reducing the voltage to a bulb will reduce the colour temperature and light output and increase the bulb life. The reverse is also true - just 6% increase in voltage causes bulb life to shorten to around 50% of normal.



Let us now consider some practical applications. There are two reasons why, finance permitting, as much illumination as possible is helpful. Firstly, the higher the lighting level, the smaller the lens aperture can be set, i.e. a higher 'f' number. The smaller the aperture, the greater the depth of field, i.e. the camera can focus sharply on the objects near to it and further away. Therefore, increasing the light enables more of the background to be in focus as well as the person or object in the foreground. The second advantage is that by increasing the light level, the 'lag' or ghosting that vidicon and related tubes suffer from is greatly reduced. Reducing the light may give a picture out of the camera, but when the view changes, lighter areas leave an afterglow effect reminiscent of a 5FP7 Radar tube!!

To use these lamps, we can consider the simplest of situations - a single head and shoulders shot. This is the most common 'on air' for amateurs, as well as covering the principles. Four lights are needed:-

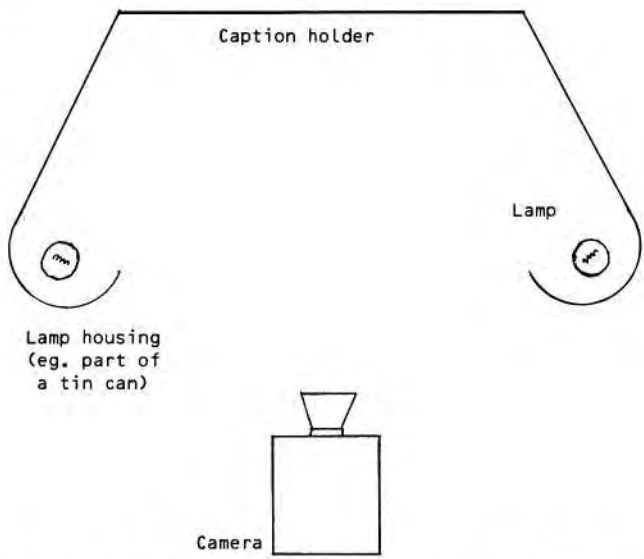
1. Fill light
2. Key light
3. Back light
4. Background light

The fill light gives an even illumination of the scene as a whole. It is important on the subject as otherwise the key light would cast deep hard

shadows on one side of the face. The key light is placed to illuminate one side of the face, so as to highlight that side and cast soft shadows on the other. This gives a sense of depth and character to the picture.

The back light, as the name suggests, is placed behind the head, so as to illuminate it from above and behind. The 'halo' effect that this produces makes the head stand out from the background, again giving a sense of depth, rather than flatness, to the picture. Care should be taken though to ensure that the light cannot shine directly into the lens, or cause lens flare. To do this, hinged metal flaps, called barn doors, are placed around the front of the lamp to control where the light can fall. The purpose of the background light is self evident.

A rather simpler situation is the lighting of captions. The same principles apply; an even light without hard shadows, but there is no background to worry about. Generally, a soft light either side of the caption holder is sufficient. Place the lamps about 6" in front of the caption, so that the light can spread fairly evenly, and make sure the bulbs are shielded so that light cannot reach the lens directly from the bulbs.



Of course it is possible to manage without this 'ideal' and the professionals will use many more lamps for even these simple situations. A simple fill light, given by a fluorescent tube, with a key light mounted on the camera, can be quite effective. A tungsten-halogen type car headlamp has been known to work well for the latter. For those who are looking for something a little more permanent for the 'shack studio', then there are available bulbs with a built in reflector, and so are 'pre-focussed'. They are intended for use in display work in shop windows etc, and normally have Edison screw bases. Although not the ideal for television, they are fairly small, and relatively inexpensive. If fitted to a 'trackline' the lamps can be moved easily, without leaving leads trailing dangerously all over the place, and provide a neat way to hold the lamps in place. Do be careful to keep within the

trackline ratings, however - they will not power the lights for an entertainment spectacular. For those wishing to try such lamps, BHS are known to stock the fittings.

The best way to learn about lighting is to have a go - at least with television the results can be instantly seen, unlike film. Hopefully this article has 'thrown some light' on the subject of illumination. In part 6 we will look at some optical odds and ends as well as some ideas for captions.

Now that this series has advanced quite a long way it is likely that some readers may have questions related to what has been printed so far and also ideas for coverage in future parts. Anyone with any ideas is invited to contact me at the address shown on page 2 of this issue.

GB3CT ATV REPEATER

By Jack Darby, G4TVC

The Crawley & District Video Repeater Group consists of only about five members, although in Crawley there are over twenty-five active ATV'ers operating on 70cm. Monday is activity night and we use ATV in the usual Crawley ARC net on Friday nights. But due to our poor location between the downs and the Horsham ridge, on which stands the Pease Pottage Radar, we don't work many stations outside the area. Of course, two or three lucky operators do live on high ground, one of whom, G1LTI, houses the present ATV repeater.

A while ago I suggested that small local groups could build video repeaters (see CQ-TV129) and this was achieved here. The cost has been around £150, most of which was collected from junk sales. I sent my original write-up to interested parties, and some of those groups have now applied for licences. The present operational GB3CT is the same as originally described but has the addition of another filter in the receiver and a 'Worthing' AGC unit in the video line to the transmitter. This unit is a must for repeater builders as it overcomes the problem of varying deviation among users.

A decision has been taken recently to build a new transmitter using the Solent Scientific 1-Watt kit plus a 10-Watt P.A. We are also considering a Wood & Douglas receiver but funds are a bit low at present.

Owing to a proposed move of QTH by the existing repeater keeper, we are to negotiate a new site on the roof of Crawley Hospital, assisted by Roy, G4WTV, who is a senior manager there.

SPECTRUM RAM CHECKER

By Trevor Brown, G8CJS

As many of us are now using Spectrum computers in the shack the following Random Access Memory (RAM) checking program may be of some use.

Issue's 2 and 3 of the 48K Spectrum use 8 x 4116 RAM for the first 16K of memory and 8 x 4532 RAM for the remaining 32K of memory. Unfortunately the 4532 device is prone to failure and locating the faulty chip(s) is not the simplest of tasks. One method of checking the RAM is to load it with alternate 0's and 1's and then verifying the load, followed by loading with alternate 1's and 0's and again verifying. This method of testing RAM is known as 'checkerboard'.

The following program will carry out such a checkerboard RAM test:

```
3 REM CHIP CHECK BY TREVOR BROWN
5 CLEAR 28000
10 PRINT AT 1,1;"RAM TEST IN PROGRESS"
20 LET a = 85
30 FOR c = 1 TO 2
40 FOR b = 30000 to 65535
50 POKE b,a
60 IF PEEK b <> a THEN PRINT b; : PRINT "   ";
70 NEXT b
80 PRINT AT 1,1; "FIRST HALF OF TEST COMPLETE"
90 LET a = 170
100 NEXT c
110 PRINT AT 1,1; " SPECTRUM RAM TEST COMPLETED   "
```

Line-10 loads '01010101' (decimal 85) into memory locations 30000 to 65535 (RAM area) under the control of the loop in lines 40 to 70.

Line-60 is the verification line, a read error will cause the address of the location to be printed on the screen.

Line-90 changes the load word to '10101010' (decimal 170).

Line-100 returns the program to the loop for a second pass.

Because the program is checking each individual location twice it is very slow, taking approximately 10 minutes to complete both passes.

Once the faulty address locations are known, then using the following system the actual devices causing the errors can be located. In IMMEDIATE MODE (no line numbers) type:

```
POKE ADDRESS, 85 : PRINT PEEK ADDRESS  (Enter)
POKE ADDRESS, 170 : PRINT PEEK ADDRESS  (Enter)
```

This should be repeated several times to confirm that any difference between the Poked and Peeked numbers is constant, the value can then be used to determine the position of the faulty chips.

If the difference amounts to any of the following numbers 128, 64, 32, 16, 8, 4, 2 or 1, then the diagram in Fig.1 of the internal layout of the Spectrum shows the location of the suspect chip. If the value returned is not one of these numbers then it is likely that more than one chip is at fault and in this case suspect those whose 'values' add up to the returned number.

If your RAM is in sockets try moving the suspect chip to another position and see if the difference returned now agrees with the new position 'value', into which the chip has been placed. If your memory is not in sockets then it's out with the soldering iron and Good Luck!

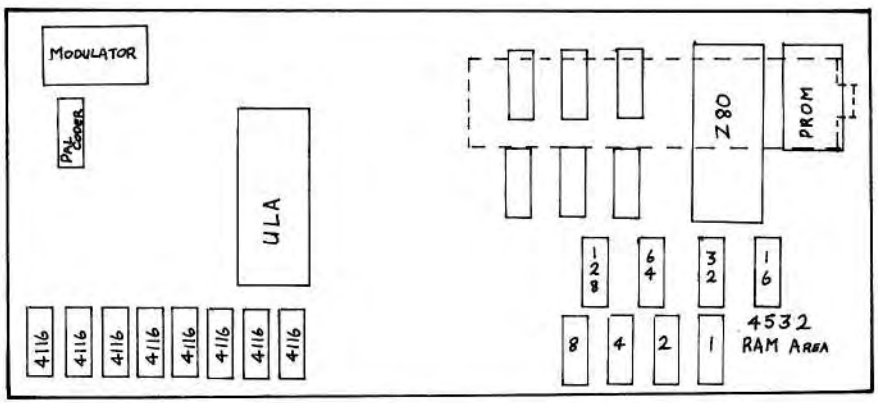
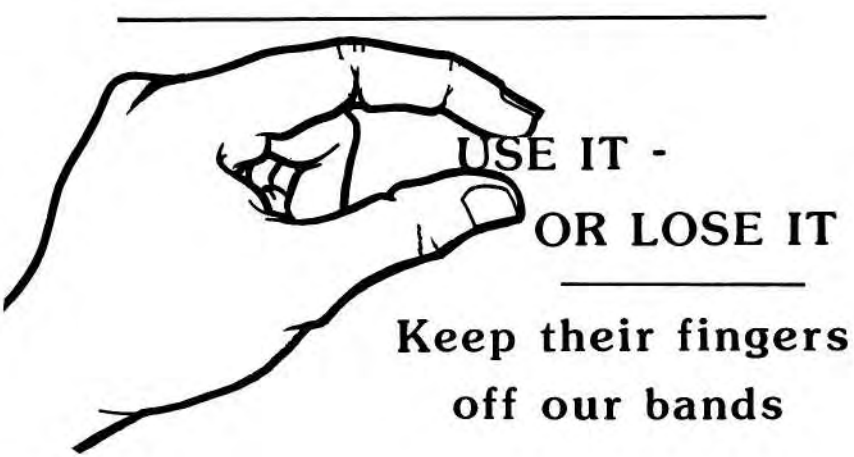


Fig.1 Showing the positioning of RAM in the Spectrum



G8LES SEEN ON WASHINGTON-DC TV NET!

As with most newspaper headlines, this is not quite what it seems! Mike has a station better than most, but cannot - yet - get 70cm across the Atlantic.

One of our American members, Bernie Keiser, visited the meeting of the Home Counties ATV Group in October, whilst in London for a few days. He talked about the state of ATV in the USA. There the first repeater was established by Bruce Brown, in Washington DC, in 1972. There are now about 40 repeaters, mainly on 70cm - they have 420 - 450 available to them - with repeater input on 439.25 and output on 426.25. Near the Canadian border, however, they have lost 420-430, so in place of in-band repeaters they use 70 and 23 cross band. In the early 1950's, they even had ATV on 2m, where the allocation is 144-148, although this is no longer permitted, as 70cm is the lowest band allowed for TV. One of the problems is that 70cm FM repeaters interfere with the ATV. Bernie commented that although the bandplans were drawn up by amateurs, they were not TV amateurs, and so problems arise (sounds VERY familiar). They do manage to output the 70cm audio on 144.97, or vice versa, to enable 'non-atv gear types' to join the net.

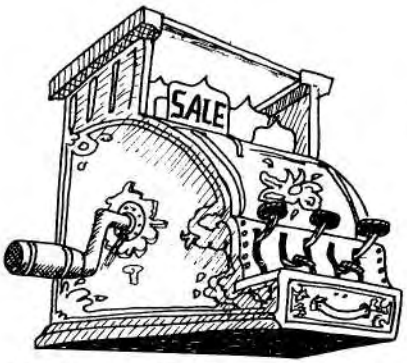
On 23cm, they used equipment from the UK, modified to suit the US audio subcarrier. This is used to relay signals from a remote repeater to the main repeater site. The use of FM causes much less degredation than using AM, they find.

The phone repeaters cause a lot of QRM, and several notch filters are required to take care of them. Unlike the position in the UK, the FCC position is 'you find it, we'll take care of it', rather like a foxhunt with a practical objective!

2-way television has been demonstrated on 10GHz, and will hopefully be put through a satellite at some time. A US ATV Satellite is being considered by the Spec Com (ex A5) team, apparently.

Those present listened with jealous interest as Bernie explained that the US repeaters operate under FCC regulations,....BUT that once the first one has been got going, anyone can put one up if they follow the rules, which include going through the 'Ham Radio Coordinating Body'. The repeater is tied to a trustee, whose licence, and call, covers it. He also spoke of the power limits - in the US the maximum is 1kW C.W., and 1kW is allowed on ATV, although most stations run rather less on account of the budget! TV repeaters are not limited to the 25W ERP within which UK repeaters have to operate.

In return, Mike (G8LES) gave an account of the state of the ATV art in the UK. This Bernie put on video tape, for transmission on the Sunday morning net on the Washington DC repeater the next weekend, to members of the Metrovision Club. Hence the headline!



MARKET PLACE

ADVERTISING RATES:

Classifieds - 5p per word*
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*Advertisements are placed in this column free of charge to paid-up members. Addresses will be included with adverts unless requested otherwise.
All ads should be sent to the Editor at 47 Crick Road, Hillmorton, Rugby CV21 4DU. Tel: (0788) 69447 before 20th March.

- FOR SALE -

JVC CP5000E U-matic player. With service manual ...£50; IVC 871PC 1" VTR. PAL colour with assemble and insert editing. With operation/service manual. Two available ...£175 each or £300 the pair; SCOTCH 1" tapes for IVC, type 461-1-2150 ...new £4 each, used £5 for 10; SONY CV2100 VTR with a few tapes and service manual ...£35; SONY AV3620CE high density VTR with service manual ...£45; Sony AV series alignment tape, for mains and portable VTR's ...£5; PHILIPS N1520 VCR with assemble and insert editing and two audio tracks. With service manual ...£35; PHILIPS N1502: head disc ...£5; various spare boards, modules, mechanical bits ...£cheap (tell me what you want). PHILIPS VCR alignment cassette ...£5; A49-11X 19" shadowmask CRT ...£5; Screened multi-core cable: 18 & 24-way in various lengths, but willing to cut to requirements ...25p/m. Offers considered for any or all of the above items. Carriage arranged at cost. Phone Peter Major on 0962 62281 ext 248 (daytime) or 0962 54851 (evening/weekend), or write to 6 Priors Way, Olivers Battery, Winchester, Hants, SO22 4HJ (s.a.e. please).

RIGONDA SPARES. The address for all your Rigonda spares is:- Rigonda Supplies, 10 Lakehouse Road, London E11 3QS Please enclose a stamped addressed envelope with enquiries.

SONY SL-8000UB Beta video recorder. Good condition generally but needs a new head, otherwise all fuctions work perfectly. Supplied WITH a brand new (unopened wrapper) head plus a new belt kit, operating instruction book, full service manual (with detailed information on head changing), dust cover and several tapes (mostly new). For quick sale...£85, would consider exchange for any ATV gear (not TV's please). 10GHz PRECISION glass vane attenuator by W.H.Sanders Ltd; micrometer head, WG16 waveguide, round flanges (with rings), in lined box and in perfect condition...£30. ELLIOTT 10GHz precision RF short; micrometer head type A, WH16 waveguide, square flange. In excellent condition this is believed to be still a current item...£15. 10GHz TUNABLE CRYSTAL DETECTOR MOUNT, two micrometer heads (frequency and coupling), round flanges, complete in wooden box and checked through a microwave lab...£20.
John Wood, G3YQC, 47 Crick Road, Hillmorton, Rugby CV21 4DU Tel: 0788 69447 (evenings/weekends).

CRT's type D13-51GH and AW17-20 still available...£10 each. Monochrome processing amplifier, complete with power supply, in smart 19" rack mount case...£10. Several Painton broadcast style faders, with microswitches at each end of track. Complete with notes on how to adapt to suit HB2 vision mixer board...£2 each. All items buyer collect or pay carriage.
Peter Delaney G8KZG, 6,East View Close, Wargrave, Berkshire.RG10 8BJ. Tel 073522 3121.

SOLENT SCIENTIFIC 24cm ATV transmitter, 1.5W output. SOLENT AM/FM receiver. LMW 23/24cm pre-amplifier. 20-turn helix 24cm aerial: The lot...£150 o.n.o. Also: WORKSHOP MANUALS for Philips 1500 video recorder and National Panasonic WV330E colour camera...£5 each. PHILIPS 1500 video recorder, good heads, needs slight attention, with tapes...£25. All items (except manuals) buyer collects.
Andy Dunham, G6OHM, 5 King Street, Wimblington, March, Cambs PE15 OQF. Tel: March 740660 (evenings only).

EIDOPHOR VIDEO PROJECTOR (monochrome), recently serviced, 3 new cathodes fitted...£250 o.n.o. Why not project your next video production masterpiece onto a 30ft screen!?
Mr. G Smart, 14 Collum Avenue, Ashby, Scunthorpe, DN16 2HB. Tel: 061 736 5843 ext 336.

3 MARCONI MkVIII auto line-up, ex-broadcast colour cameras, complete V/F's, R.T,H. 10 x 1 zoom lenses, C.C.U.'s, C.C.U. power supplies, pistol grip zoom demand and built-in shot box, operational and aux. control panels with 50ft cable, Astrolite 'cans', Marconi coders, nearly 1000ft camera cable, 4 spare sets of Plumbicons, handbooks. Any offers? 2 VINTEN TRIPODS, 1 set wheels, 1 head. COX BOX, 2-level, 18 switched/variable colours, 1 x RU plus control panel, handbook...£50. COX downstream keyer, fade black, cut, PGM, mix key, 1 x RU plus control panel, handbook...£50. PROWEST SWITCHER, 8 inputs, 2 separately switched outputs, 3 outputs each, cut in blanking, cables, 3 x RU, handbook, no panel. Basis for an A/B vision mixer...£50. IKEGAMI detail corrector, vert/horizontal, composite or RGB inputs. Very crisp output. 1 x RU, handbook...£70. PYE TVT dual input PAL/NTSC switched decoder, RGB plus sync outputss, 3 x RU...£50. RS (Electromail) KEYBOARD case; 508-273 new...£10. SONY wide angle screw-on conversion lens for HVC3000 series camera, case, boxed and unused...£40. COSMICAR macro lens, 25mm, f1.4, C-mount, 6" minimum focus...£30. 2ft and 4ft parabolic dishes with 11GHz waveguide prime focus feeds, ex links...£50 and £100. SATELLITE RECEIVER, full band, N-plug input with power to LNB. Video and sound outputs on BNC and phone. Variable audio bandwidth...£150. All items o.n.o.
Allen Mc Murtry, GI3MBB, 20 Towerview Crescent, Bangor, Co.Down, Northern Ireland BT19 2BA. Tel: (0247) 461946

TVC 435/40 ATV receive converters (2-off), as new and unused...£20 ea or £35 pair. 24cm TRIPLER, built and aligned on 1260MHz, 10W out for 20W drive...£35. CAMERA TRIPOD, good condition...£10. All plus postage.
Steve Whalley, G4DVN, 1 Radley Way, Werrington, Stoke-on-Trent, Staffs ST9 0JN. Tel: 078 130 5153

LABGEAR masthead amplifier type CM7066, UHF 470-860MHz, 26dB gain...£11. Band-5 inline double notch filter (Teldis)...£5. Both only been used indoors - as new.
M.Davies, G4CGH, 3 Monkstone Drive, Berrow, Nr. Burnham on Sea, Somerset TA8 2NW. Tel: 0278 787202

SOLENT SCIENTIFIC units for sale - 23/24cm ATV converter, works well, in diecast box...£20. MICRO TRANSMITTER...£22. Both in excellent condition, Both plus 50p postage.
Roger Bunney, G8ZMM, 33 Cherville Street, Romsey, Hants SO51 8FB

HELP!! I have a warehouse full of televisions. If you have a little time on your hands (after your hobby, that is) why not start your own TV business? I have a continuous supply of used TV's, videos and spares. They are all good but are U.K. standard so won't work in Germany, that's why they have to go! If you are interested please write to:
Fernseh Buhrmester, PO box 1124, 4955 Hille 1, West Germany or phone any evening, DL4QD on: 01049 5703 2075

HITACHI GP5 colour camera, 'C' mount, with lens...£90. ADVANCE SG63D signal generator, 4-220MHz, AM, FM, sweep, with copy of service manual...£50. Both believed to be in good working order. ADVANCE OS250A oscilloscope, excellent physical condition but requires a new CRT. With full handbook...£25. MAZDA 'New Life' A56-150X CRT, unused...£20. ILP 240v in/out toroidal transformer, 625VA rated, unused...£15. All above o.n.o. (See also 'U-MATIC' ad in the 'Wanted' section).
David Saunders, 1 Roberts Close, Wroughton, Swindon, Wilts SN4 ORS. Tel: (0793) 36251 ext 2080 (office hours) or (0793) 813820 (evenings - not Tues), 7.30 - 9.00pm.

COMPLETE COLOUR PORTABLE OUTFIT - Akai VC150 2-tube colour camera with zoom lens and electronic viewfinder, plus reel-to-reel colour recorder, tapes, UHF modulator, manual. Bargain...£200. 8ft DIAMETER PETAL DISH (used on 12GHz), az/el mount...£100. 10ft DIAMETER GLASS FIBRE DISH, polar mount (used on 12GHz)...£150. 60ft CLIMABLE lattice tower with all fixings, guys etc., including various 2m, 70cm and 24cm aerials. Buyer dismantles hence...£75 the lot. All offers considered, or swaps, W.H.Y?
Nick Harrold, G4IMO, Hillcroft, Lark Hill Road, Canewdon, Nr. Rochford, Essex SS4 3RZ.. Tel: Canewdon 8809

SONY EX-SURVEILLANCE CAMERA AVC 3000CE, takes 'C' mount lenses...£25. REMOTE pan head...£10. 23/24cm SANDPIPER 20-turn helix aerial...£20. ROTATOR and controller, motor OK, gearing needs some attention...£10. MICROWAVE MODULES MML 144/30-LS linear amplifier, PA transistor blown...offers?
Keith Miles G10TO, 99 Kenrick Road, Mapperley, Nottingham NG3 6EZ. Tel: 0602 503312.

TEKTRONIX 545A OSCILLOSCOPE, working but CRT is suspect, otherwise believed to be in good order...£40. ALSO 'CA' (twin beam) plug-in module and 'K' (single beam) plug-in for this, and other 500 series oscilloscopes...£10 each. SONY DM-3 monitor speakers, floor standing, (29"h x 12"d x 16"w), electrostatic tweeter, midrange, 12" elyptical woofer, solid teak cabinets...£40 pair (will separate).
Mike Wooding, G6IQM, 5 Ware Orchard, Barby, Nr. Rugby, CV23 8UF Tel: (0788) 890365

PHILIPS VCR's; N1500/N1501/N1520 (editing model), also numerous tapes, assorted conditions and prices. NTSC/PAL converter, plus circuit diagrams (ex-BBC equipment)...£55. JVC colour TV/monitor, CX-610GB, PAL/SECAM, video in/out, carrying case, rechargeable battery pack, excellent condition...£245 ono. SAE for details to:-
Peter Cross, 8 Broom Mead, Bexleyheath, Kent DA6 7NY Tel: (0322) 522809

AMSTRAD PCW-8256 word processing system (computer, monitor and screen) in "as new" condition plus a few discs. £300 for quick sale, needs to be collected. Ring Peter Emmerson on Wellingborough (0933) 222196 during working hours.

- WANTED -

PAST ISSUES OF CQ-TV MAGAZINE wanted for private collection. All issues prior to No.123. Also 'TELEVISION' magazines prior to 1983 wanted urgently. Good prices paid.
David Norrell, 51 Cairngorm Walk, Larne, Co. Antrim, Northern Ireland BT40 2JP

BIG PRINT program for a Commodore-64 micro suitable for SSTV captions.
Andy Dunham, G6OHM, 5 King Street, Wimblington, March, Cambs PE15 0QF. Tel: March 740660 (evenings only).

MONOCHROME OR COLOUR camera wanted. Must have an external sync facility, any condition or type considered.
Steve Haseldine, G8EBM, Leamington House, Burland Green Lane, Weston Underwood, Derbyshire DE6 4PF. Tel: 0335 60755

WANTED; a member who would be willing to assemble and test the video sync processor system in CQ-TV 129 - the colour model when this is perfected; from scratch, for a new member who does not feel competent enough to tackle such a complex project, and also has no access to test equipment. A very fair price will be offered, please contact me with an estimate.
D.J.Oliver, 100 May Lane, Kings Heath, Birmingham B14 4AG

U-MATIC NEC PVC 8307, record/playback, PAL/NTSC switchable, auto rewind, auto repeat, 2 channel sound and audio dub. Complete with 8 cassettes (7 hours of tape) and instruction book. Will swap for a pair of Quad Electrostatic Loudspeakers, or offers. MAINS TRANSFORMER and power/tuner board wanted for a Mitsubishi HS320B video recorder (storm damage). Also TUNER for Bush BC7100B TV (Rank/Toshiba T24 chassis); Quad electrostatic speakers; old valved audio gear ie: Leak stereo 60, Valves: KT66, KT88, output transformers in pairs etc.
David Saunders, 1 Roberts Close, Wroughton, Swindon, Wilts SN4 0RS. Tel: (0793) 36251 ext 2080 (office hours) or (0793) 813820 (evenings - not Tues), 7.30 - 9.00pm.

INFORMATION, service manual, circuit diagram or what have you, required for a Shibaden SV700E video recorder and JVC Nivoco camera type TK66. ASSISTANCE in obtaining a spare drive belt and/or pinch wheel for the VTR would be appreciated.
Alan Strong, G3WXI, 1 St. Peter Avenue, Deepcar, Sheffield S30 5SL. Tel: 0742 883672

FAST TO SLOW scan converter wanted to hire or buy. Also suitable camera for same. Anything considered.
P Stenfalt, 82 Humbolt Road, Fulham, London W6 8QJ Tel: 01 385 7085

16mm and 8mm film equipment wanted: 16mm Bell & Howell GSAP gun camera, ex Government cine, 50ft magazine load, 24v DC, electric drive (W/W2 item). 8mm st'd 8 Quartz reflex-5 camera. 10mm 'C' mount Switar lens or similar. N9 American (ex US forces) 100ft Coaxial load cine camera. TELFORD ex government 16mm cine camera.
John Sims, 25 Brecon Close, Melksham, Wilts SN12 7RZ. Tel: 0225 706795.

VINTAGE 405-LINE COLLECTOR urgently requires a good 405-line signal source. Monoscope, pattern generator etc. Also MARCONI 819 picture monitors, manual for a Peto Scott (Philips) EL3400A 405-line 1" video tape recorder, early TV sets, books, magazines, advertising material etc. All 405-line video recordings (any system), anything old considered.
Bill Journeaux, 7 Blair Avenue, Poole, Dorset BH14 0DA. Tel: (0202) 748072.

BASIC DATA on the ITT shift register, 330399/500 and the Texas log/antilog amplifier, TL441 wanted.
Doug Pitt, 1 Burnwood Drive, Wollaton, Nottingham, NG8 2DJ Tel: (0602) 282896

DOES ANYONE have or know a supplier for a picture tube for the Sony camera HVC-3000P and/or the 10-pin plugs to suit the latest range of camcorders (eg. JVC GC-R7)?
Peter Cross, 8 Broom Mead, Bexleyheath, Kent DA6 7NY Tel: (0322) 522809

Satellite

READY-BUILT SATELLITE TVRO EQUIPMENT

Comex CR100 receiver	phone
Comex CC25 SMATV receiver	phone
Comex SF1000 sync processor/decoder	phone
Connexions CX2460R infra-red remote receiver	345.00
Connexions CX2460 rotary tune receiver	225.00
Connexions CXP6000 motorised dish drive (inc. cable)	225.00

SATELLITE TVRO KITS

TVRO receiver motherboard kit	35.00
AT1020 tuner module	35.10
AT3010 IF/demodulator module	54.65
New wideband tuner modules	phone
Polarotor kit (inc. feedhorn, polarotor and electronics)	85.00
Power supply kit	32.50
'S' meter kit	17.00
Tunable sound demodulator kit	30.00
RF modulator kit	25.00
Digital tuning and display kit	56.75
6.5MHz I/C sound kit (modification for receiver kit)	1.10
Video clamp kit	2.75
Low-noise IF pre-amplifier kit	35.00
Case for TVRO kit receiver	20.00

LNB's & FEEDHORNS

STS LNB (2.1dB noise, 56dB gain)	178.25
Connexions CX132 LNB	225.00
SPC LNB	182.00
NEC 2021 LNB	183.54
Comex scalar horn	49.00
Comex polarotor (pulse type, inc. feedhorn)	72.00
Connexions polarotor (inc. feedhorn)	75.00
Mitsubishi heterodyne converter	37.00

DISHES & MOUNTS

Kord 1.6m GRP dish (43.5dB gain)	97.75
Kord 1.2m GRP dish	phone
Connexions CX120 1.2m offset dish, polar mount and stand	290.00
Connexions CX180P 1.8m petalised dish with polar mount	484.00
Kord polar mount	109.25
Comex polar mount (takes up to a 2.1m dish)	128.00
Kord LNB tripod assembly	16.68

ACCESSORIES

20dB inline amplifier	22.00
Comex low-noise inline amplifier	46.50
2-way passive signal splitter	10.00
2-way active signal splitter	27.00
4-way passive signal splitter	17.00
Site survey inclinometer	25.00

TVRO MODULES

Astec AT1020 tuner	35.10
Astec wideband tuner module	phone
Astec AT3010 IF/demodulator	54.65
Mitsubishi heterodyne converter	37.00
Astec UM1289 RF modulator	11.05
Astec UM2301 RF modulator	11.90
Astec UM2302 RF modulator (PAL B)	12.20

PLUGS & ADAPTORS

'F' type plugs	0.50
'N' type plugs	3.50
BNC plugs	1.75
'F' plug to BNC socket	1.70
'F' plug to 'N' socket	3.00
'F' socket to 'N' plug	3.00

CABLES

RG58 50-ohm, 100pF/m, 7.6dB loss per 10m @ 1000MHz	28p/metre
RG213 50-ohm, 100pF/m, 2.5dB loss per 10m @ 1000MHz	85p/metre
Pope H100 50-ohm, very low loss	£1.00/metre
Motor drive cable - 5-core	£1.57/metre
Multi-cable (motor drive, polarotor and RF)	£3.20/metre

Carriage & ordering

Order value below £30 please add 0.60
Order value £30-£100 please add £1.50
Order value over £100 please add £2.50

Carriage on dishes is extra; £28 for the U.K. mainland. Dishes can only be delivered to a registered business address.
Overseas customers should please ask for a quotation of shiping costs.

ALL PRICES INCLUDE VAT AT THE CURRENT RATE

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Our new antenna package is now available consisting of our high-gain 1.2m offset dish, feed and feed support, and unique precision polar mount. The mount has been carefully designed and manufactured to make installation as easy as possible. Each mount is preset for the destination location, so that after assembly the only adjustment required is to set the polar axis north-south. The mount will then track the geostationary orbit with no further adjustments necessary.
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Our line amplifier can be used to increase signal levels when cable losses are causing sensitivity problems. It covers 750 - 1750MHz and provides at least 20dB gain over the band and is supplied as a PCB with BNC connectors fitted. A through DC connection is provided to allow the LNB to be powered by the indoor receiver. price..... £31.50

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MITSUBISHI FOUP11KF modules..... £34.50 (£44.50 modified to normal IF)

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For further information on any of our products, or to arrange a visit to see our equipment in operation, please write or telephone (9am-8pm seven days a week).

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