CQ-TV MAGAZINE No. 140

BRITISH AMATEUR TELEVISION CLUB

NOVEMBER 1987

Repeaters list - Servicing the TX-90
TVRO modules - Sound demodulator
SCART - VSWR - Sync separator
Reviews - Portable generators
Building repeaters - A/V fader
TV software - Contest news
Time base correction

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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.

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CLOSE FOR PRESS DATE FOR THE FEBRUARY 1988 ISSUE.....20th DECEMBER 1987

NEED ANY HELP?

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 with 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

TVI & RADIO INTERFERENCE - problems of this nature to: Les Robotham G8KLH, 38 Ennerdale Avenue, Stanmore, Middx. HA7 2LD. Tel:(01 907) 4219 (not committee).

CQ-TV MAGAZINE - Anything destined for publication in CQ-TV magazine 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

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,

HELP! I live in the York/Harrogate area and am hoping to start receiving 70cm ATV. But I have no idea what equipment I shall need for this band. I would also like to know what price range we are talking about (I don't mind buying second-hand) as I have a very limited budget.

If anyone could enlighten me in any way I would be most grateful.

James Standen
122 Prince Rupert Drive, Tockwith, York YO5 8QS.

This kind of information is available in the BATC publication 'TV For Amateurs' (see publications order form in the supplement).

There is always a committee member who can help on the end of a telephone. Consult page two of each issue and select the most appropriate person. If that member can't help he will refer you to someone who can.

You could advertise for second-hand equipment in CQ-TV.

Ed

Dear Ed,

After reading your article on ATV software in the last issue, I thought readers might be interested to learn where the Pioneer PX-7 A/V computer can be purchased. I bought mine recently from Videoquip Ltd at 5 Fosse Road South, Leicester LE3 0LP. Tel: (0533) 558818.

Their current offer is for the computer bundled with a video titling and display program on a ROM cartridge which is similar to the one reviewed in CQ-TV. The price is £199.90 and advertisements can be found in 'What Video' magazine.

The PX-7 is obviously useful for its keying facility and it can also be used as a simple sound and vision mixer, switching between the computer and an external video and sound source, using the keys on the left of the keyboard. Another interesting feature is the ability to display any character to fill the whole screen - which would seem handy for ATV contests.

Nicholas Oliver.

And now, the very last word on this subject?

Dear Ed,

Please, please do NOT change the magazine format. If you went to A4 the mag would get lost amongst all the other large-format magazines, which all appear to be trying to outdo each other in including the words "Electronics" or "Computers" in their glossy title pages. The next that would happen is that the price would have to go up and we would find the very valuable text sprinkled with advertisements which become dated in a short time, but would clutter the magazine for ever.

The beauty of CQ-TV at the moment is that it provides conveniently sized reference works. The present size makes the magazine immediately identifiable from amongst all the other publications on the bench etc. I often refer to articles going right back to issue 70 or so.

M.King ZL2AVE

Dear Ed,

Thank you for putting out a superb magazine. As a fairly non-active TV'er I don't have a lot of time in the shack and it's due to stalwarts like yourself (with the understanding of the wife) which keeps our side of the hobby going. Well done.

Steve Cowie, GOEZB

Dear Ed,

As a recently joined-up member of BATC I would like to congratulate you on a marvellous magazine.

It really is refreshing to come across a club which can produce such an interesting mag., packed full of useful information.

Being involved with video at work as well as at home I sometimes find it difficult over here to get information on the older equipment, and, with this in mind I am contacting you to put an ad. in the 'wanted column.

Rod Walsh EI7DF

Dear Ed,

Please allow me to see if I can arouse someone's interest in a little project - amateur TV on the move - which should be well within our capabilities as it will be somewhat easier than - for example - the recent use of 24cm TV from a radio controlled helicopter, as demonstrated at the BATC Crick show.

Amongst my other interests is one on two wheels, with or without an engine. I have always observed with interest the motorcycle outriders which attend the Tour-de-France cycle race, carrying TV cameramen as pillion passengers. Their pictures are relayed back to a conventional O.B. unit and thence to the viewing public.

I ride a BMW motorcycle and am looking for a volunteer builder of rugged, portable 24cm equipment, a volunteer pillion cameraman (not necessarily the builder) and probably also someone with the capability of re-transmitting on 70cm. The idea then would be to liaise with cycle racing clubs to organise the opportunity to publicise live TV on the move.

Anyone game to try?

Paul Thompson G6MEN.
P.O.Box 32,
Shrewsbury SY1 1ZZ

NEWS ROUNDUP

MEMBERSHIP NUMBERS

All members have now been issued with a membership number. This can be found on the address label which is stuck in the panel provided on the back page of the advertising supplement with this issue.

The number has six digits. The first two indicate the year that your subscription has been paid up to, and the rest is the club's database record number.

You are asked to keep your current membership number to hand since it is possible that it may be needed in the future for obtaining club discounts as well as club sales items at rallies etc. This represents a first step towards a more comprehensive accounting system within the organisation due to forthcoming tax liabilities and VAT.
The club is due to become registered for VAT on January 1st 1988. More information will follow in CQ-TV magazines and some prices will be varied as a consequence.

Because of the modified address labeling layout it is now possible to re-introduce callsigns. This facility has been taken advantage of.

VIDEO SYNC SEPARATOR CHIP

Thanks to the many members who advised of a new sync separator chip from the National Semiconductor Corporation.

The LM1881 is in a standard 8-pin DIL package and features: AC coupled composite input signal, 10k input resistance, 10mA supply current, composite sync and vertical outputs, odd/even field output, burst gate/back porch output, resistor programmable horizontal scan rate and edge triggered vertical output.

This chip should find many applications in the amateur TV shack and the CQ-TV editors would like to hear from anyone using it.

NEWVICON CAMERA TUBES

Hugh Wynne has available once again a dozen or so ex-service Newvicon 1" CCTV camera tubes to give away. Any BATC members who wish to take advantage of this extremely generous offer should write to Mr.Wynne at 103 New City Road, Glasgow G4 9JX.

Don't forget the curtesy of a stamped addressed envelope, nor that you will need to pay postage costs.

FRONT COVER PHOTOGRAPH

VK2RTS is a proposed ATV repeater for the Sydney area which will radiate vision on 579.25MHz. The video generator is a Cropredy system equipped with the colouriser described by Richard Carden, VK2XRL in the last CQ-TV.

Richard's callsign was incorrectly shown in that article. It should have been VK2XRL - sorry.

CQ-TV COPY

Although we had quite a lot of material left over from the last issue, things have dried up a bit during the summer months(!)

Now that winter is upon us again (where WAS the summer?) this is the time to write that piece or article which you have intended doing for some time. All donations gratefully received by either editor.

CQ-TV SUPPLEMENT

Because of recent pressure on magazine space, and the fact that our collators have difficulty in stapling 100 pages, the members services forms, member's ad's (Market Place) and sundry other advertisements and information pages will henceforth be printed as a separate supplement.

SATELLITE TV GEAR

Further to the mention in the last issue about the supply of ASTEC TVRO modules, Satalite TV Services would like to add some more information:

The modules are normally ONLY available as a pair (tuner and IF/demodulator) for £85 inclusive of VAT plus £2.50 postage and insurance. However, as a special concession, they are prepared to sell the modules singly to BATC members. The prices then are £35 for the AT1020 tuner and £55 for the AT3010 IF/demodulator - plus postage and insurance.

Please also note that Satalite TV Services are manufacturers and therefore don't have retail premises for demonstration and collection purposes. Orders however can be delivered within 48-hours anywhere in the U.K. A TVRO fact file is available to satellite enthusiasts for £5 (refundable).

The company would also be interested to hear from enthusiasts looking for pieces of satellite equipment which seem a bit difficult to get. We can all buy the posh black boxes but many of us like to make our own. Things like tunable sound modules, digital or analogue readout, direction indicators or anything else. If you have any ideas in this line then please contact P.O.Box 26, Worksop, Notts S80 1XW. Tel: (0909) 722437

ATV IN NEW ZEALAND JOURNAL

The official journal of the N.Z. Association of Radio Transmitters (Inc.) devoted much of their August 1987 issue to amateur TV. Thanks to BATC member Michael Sheffield ZL1ABS, the magazine carried a wide range of articles including some from CQ-TV.

Michael has certainly been doing his best to promote amateur TV in New Zealand and it looks as though he is succeeding. Well done.

TEST CARD EPROMS AND A COLOURISER KIT

Yes, the're at it again. The Worthing ATV repeater Group have expanded their range of available EPROMS for the Cropredy test card generator, and many of them now reflect the fact that they can be colourised (see article in the last issue).

The group have also brought out a colouriser kit based on the CQ-TV design which costs £16 each. The kit includes a printed circuit board, all the necessary components and full construction and alignment instructions. A SAE will bring you a list of Eproms although this is included with orders for the colouriser. The Worthing Group's advertisement may be found elsewhere in CQ-TV.

Geoff Mather G8DHE, 72 Cranleigh Road, Worthing, West Sussex BN14 7QW. Tel: (0903) 32161, E.Mail: 82:TSR002.

SUBSCRIPTION RENEWALS

You will no doubt have observed that there is no subscription renewal form included with this issue. No you're not going to get away with it! However, for administrative reasons, we would prefer all subscriptions this time to be paid AFTER december 31st. Accordingly a separate reminder will be sent out closer to that date.

Despite the fact that the BATC will be VAT registered on January 1st 1988, the committee have decided to absorb the VAT in subscriptions for 1988, therefore the cost will remain at £6.

MEMBERS SERVICES

BATC Members Services does not hold stocks of BATC publications, and vice versa. Please send your order to the appropriate address, as otherwise extra delay and expense is caused in fulfilling the order.

Several members have been making payment by open postal order - please, for your own security, send a crossed postal order or cheque payable to BATC.

Batches of callsign badges are sent to the engravers 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 are distributed to members as soon as they have been engraved.

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 new boards are in preparation, and will be announced on the BATC Prestel pages, if you cannot wait for the next CQ-TV.

BATC BECOMES VAT REGISTERED

Because the club continues to grow, producing a spiralling cash turnover, we have been obliged to apply to be VAT registered.

Registration is due to take place on the first of January 1988 and from that date most items purchased from the club will need to have VAT added.

The Member's Services form with this issue has a space for the VAT total which must be added to the goods total PLUS the postage. Use of this space however will only take effect after the 31st of December.

The BATC's registration number will be included where appropriate starting with the next issue of CQ-TV.

BATC NEWS ON PRESTEL
Select ClubSpot page 8106262
or *BATC

AN A/V FADER

By John Goode

I have built three of these units for use in colleges as a means of improving the simple editing facilities available when copy-editing using two VHS (or other domestic) video recorders. The unit is connected between the source and destination recorders, and allows the video to be faded to colour-black. In addition, a two-channel mixer for sound is provided so that the video sound can be faded and an external pre-recorded commentary or music added without completely eliminating the original soundtrack.

CIRCUIT DESCRIPTION.

The video circuit is illustrated in Fig.1. The basic idea is to extract black and burst from the incoming video, and then mix to this using a twin-ganged fader to give fade to black. This method is preferred to a system using the blanking waveform to switch between video and sync for the following reasons:-

(1) The difficulty of generating proper blanking from extracted sync.

(2) The need to establish an accurate black-level for switching systems.

(3) With the adopted method, the signal is passed through without any processing when faded-up. The signal therefore suffers no unnecessary degradation.

Video isterminatedand passed to the ganged fader. In the original prototype two 500ohm sliders bolted together were used, but these were from some old stock I had, and are not (I think) generably available; as well as this, two faders combined gives rather stiff operation. The only easily obtainable twin linear slider I know of is the RS type 162-940 (available from Electromail), and the lowest value available is 10kohms. Consequently, the outputs must be converted to a lower impedance by emitter-followers before the signal can be applied to the 2N3906 mixing stage. If 500ohm ganged sliders are available, their wiper connections can be taken directly to the 100u coupling capacitors at the mix stage, and the two BC107 emitter-follower stages omitted. After the mix stage, a distribution amplifier provides a 75ohm output.

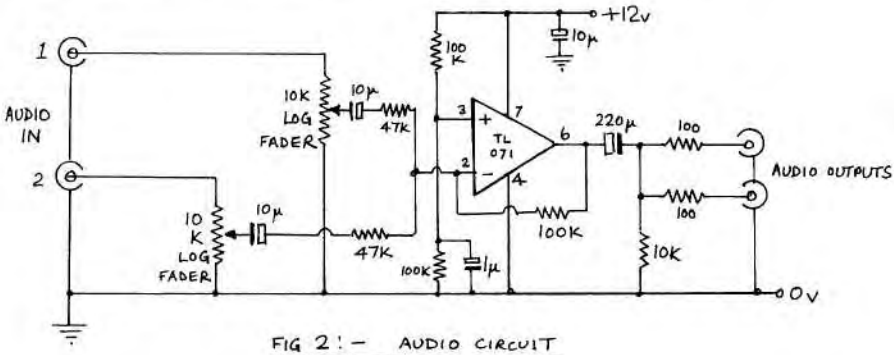

FIG 2 :- AUDIO CIRCUIT

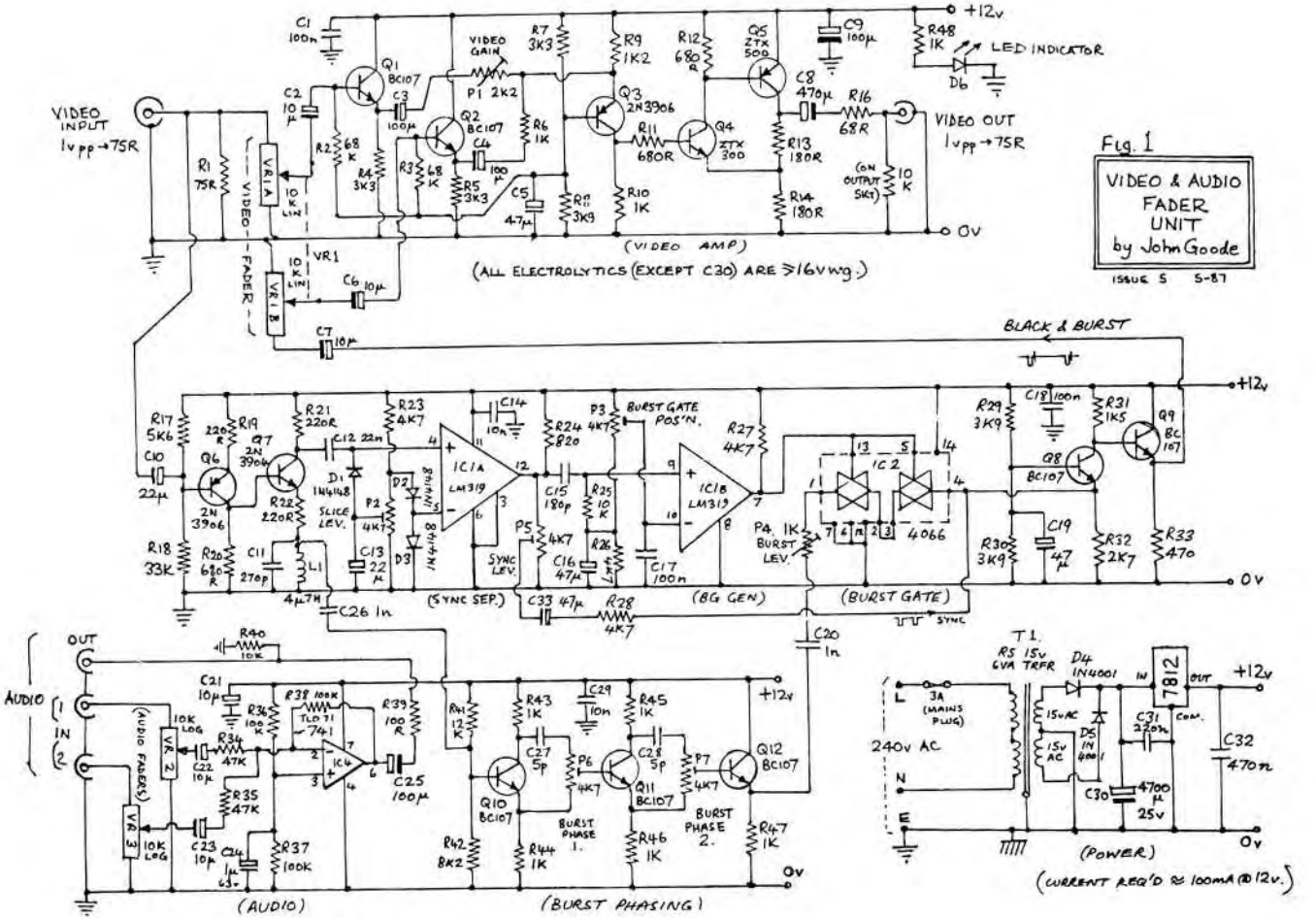

Fig. 1

VIDEO & AUDIO FADER UNIT
by John Goode

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The remainder of the circuit is concerned with black and burst generation. The input signal is amplified and the chroma signal extracted. A dual comparator, type LM319, is used as sync-separator and burst-gate generator. The sync separator should work eith the slice-level pot set centrally; however, it will be necessary to scope the burst gate output (pin 12) and adjust the slice level so that the BG coincides with the input signal burst.

Separated chroma is sent via a phasing circuit that is adjusted so that there is minimum burst phase-shift when fading to black. The best way to set this (assuming that a vectorscope is not to hand), is to adjust for minimum variation in amplitude of the burst as the signal is faded to black.(This will also be affected by the matching of the ganged faders, of course). After phasing, the burst is gated by half of a 4066 quad bilateral switch. This will not give TOTAL suppression of 100% bars, but is adequate for "normal" pictures. Separated sync from the LM319 is then added at the BC107 common-base stage, and the complete colour-black signal then goes to the ganged video fader.

Fig.2 shows the audio circuit, which is very simple. The inputs are designed for signals of 100-700mV level, as provided by most tape recorders. The op-amp is arranged as a virtual-earth mixer, and, although the TL 071 is preferred for audio, in this application a 741 would probably be adequate. Two 100ohm outputs are provided. Fig.3 is a suitable power supply, using a 7812 three-terminal regulator.

Although the facilities provided by this unit are fairly basic, it is surprising how much difference it makes when editing videotape to be able to incorporate sound and vision fades, and add commentary and music without completely obliterating the original sountrack. (Please note that the use of commercially recorded music is subject to the laws of copyright if the tape is to be used other than strictly privately).

At the risk of stating the obvious, it should be pointed out that at fade-out colour black will only remain at the video output so long as a colour signal is provided at the input.

This project has been costed out; buying all new components, including a box at around £38. Surely a cost-effective addition to any videography studio.

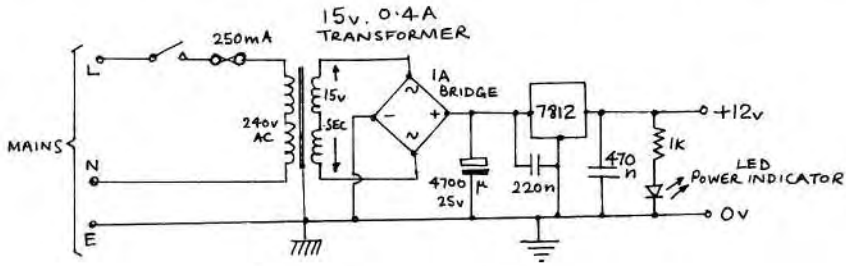


FIG 3 :— POWER SUPPLY

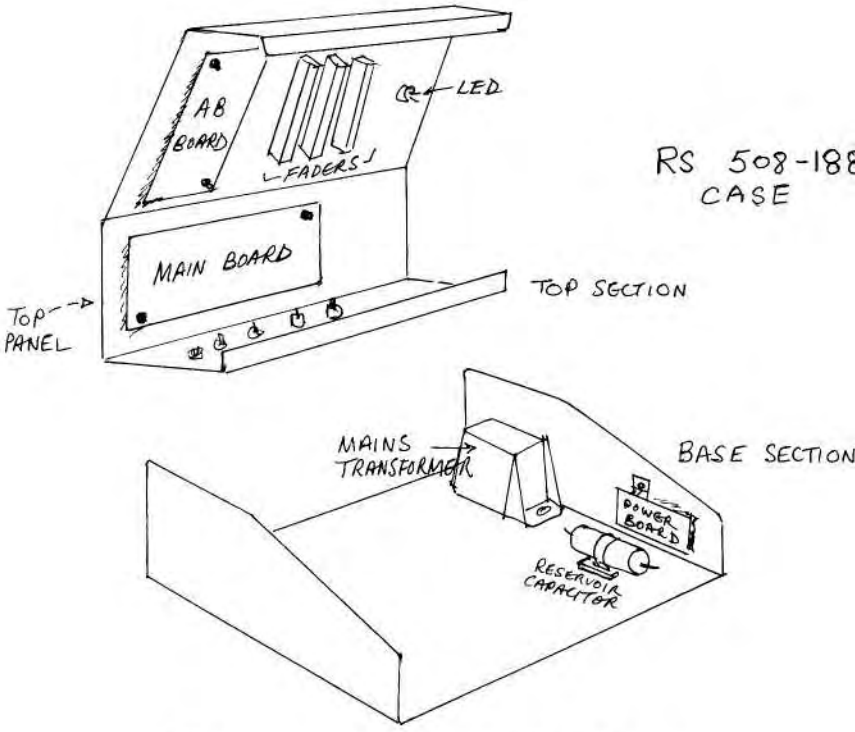


Fig.4 SUGGESTED CABINET AND LAYOUT

A pair of printed circuit boards is being produced for this project and should be available shortly. Please send a stamped postcard with enquiries to members services or phone on (073 522) 3121 evenings/weekends.

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.

'TOP OF FRAME' IDENT

By Trevor Brown G8CJS

It might be said by many that the following idea was the only good thing to come out of the General Election last May 11th. It was, of course, a night for politicians to move right or left of centre. However, here at ITN, the engineering staff decided to move them all to Top-of-Frame!

In TV production control rooms around the country, there can be up to forty separate vision signals on the video mixing desk at times during elections. Most of these will be coming from separate outside broadcast units, and the problem has always been how to identify them quickly in the production suite. The answer the engineers came up with was to insert an ident code into the vertical interval at the beginning of each television frame.

This ident had to be simple to generate and equally simple to read. What was not required was a complex ident requiring a computer to decode it, here at ITN we can't afford that many computers anyway! The answer was to use a simple character generator to insert a vision ident code that could simply be read off the top of the frame. How does one read something off the top of the frame when it isn't (or shouldn't) be visible on a normally adjusted monitor? In studios this is not a problem as the synchronising system allows the picture to be locked half way down the screen, thus revealing the ident.

The ident code could not be left in the vision signal for domestic transmission as the vertical interval is used for teletext and control information. Thus, once the selected signal routes from the production console, a simple processing amplifier is used to remove the ident and consequently hide this 'hi-tech' secret from the world.

Of course, it doesn't end there, as with many good ideas there is often a spin-off for the amateur. Those of you using the Handbook-1 character generator can also utilise this system. The simple modification consists of inserting link A-C, connect pin F to IC8 pin 12 and reduce the 2.2uF capacitor connected between pins-14 and 15 of IC2 to 0.15uF.

That's it! you can now generate up to eight characters which will be automatically inserted into the vertical interval. But, how can the receiving station read them? Not quite as sophisticated as at ITN, but all the viewing station has to do is to adjust the vertical hold of his monitor and read the ident as the picture revolves round. One way of finding out who's holding the local ATV repeater open with that boring monologue!

THE BATC TECHNICAL LIAISON COMMITTEE

Some time ago the BATC formed a Technical Liaison Committee headed by Paul Elliott G4MQS. Its brief was to co-ordinate matters of a technical nature associated with amateur television and to liaise with other interested parties to that end.

Unfortunately Paul has been unable to carry out the work of the Committee and, since it is so important, the BATC general committee have asked me to head the TLC for the time being, and to establish a structure for future undertakings. This I have somewhat reluctantly agreed to do. My reluctance stems from the huge amount of work I already carry out and the fear of becoming so overburdened that standards will fall.

I am determined however that the Committee will tackle its work with enthusiasm and make a real and lasting contribution to the amateur television service. To this end the Committee needs the help of BATC members who feel able and qualified to contribute.

AIMS AND OBJECTIVES

The TL committee will study and make recommendations on such topics as the effective use and promotion of all bands allocated to ATV activities; the choosing of specific ATV calling and working frequencies; to suggest how ATV may best be included in band plans; standardise many of the technical parameters for video and its transmission by radio frequencies; make technical recommendations for standardisation of repeaters and future interlinking; examine the use and applications of new technology in ATV; examine techniques of digital control, signalling, information transmission and retrieval as part of the video signal and monitor developments in space communication where it is applicable to television.

Recommendations and advice from the Technical Liaison Committee will be put before the BATC General Committee. Action and implementation will, where appropriate, be made through Graham Shirville G3VZV, who handles liaison between the BATC and RSGB and subsequently to the DTI, IARU etc. There will also be close co-operation with the European ATV Working Group through its Chairman, Andy Emmerson G8PTH.

THE COMMITTEE STRUCTURE

The BATC Technical Liaison Committee will liaise with the BATC General Committee through myself as Chairman. Committee members will be members of the BATC who volunteer their services and commit themselves to active participation.

Because members will be widespread throughout the U.K. (and abroad), it is impractical to hold regular meetings. Almost all work therefore will be undertaken by post, telephone, over the air or by small groups who are able to meet together when necessary. All reasonable expenses (mail costs, telephone calls etc) will be met from BATC funds. It may be possible to arrange the occasional meeting at, say, the BATC annual show.

WHERE YOU COME IN

a) If you think you are able to help in one or more areas already outlined and would like to be a member of the committee, please contact me for an application form.

b) If you require further information please contact me directly, preferably by telephone or over the air.

Finally, I must stress that membership of the committee commits you to active participation whenever a subject in your particular field is being considered. I don't see that this will entail more than a very few letters or phone calls each year. Like me, you will doubtless have come across people who sit on committees simply for the prestige: these well-meaning 'hangers on' simply swell the numbers to no effect and cause additional and unneccessary administration and expense. I hope that we will not suffer this fate.

At the time of writing (mid September) a fairly strong committee has already been established and two work documents have been brought to satisfactory conclusions.

Work currently in hand concerns a complete frequency modulation analysis of amateur television transmissions, with final recommendations for standards and practices, and an outline document working towards the standardisation of ATV repeater interlinking. There is a great deal of work waiting to be done.

John Wood, G3YQC.

47 Crick Road,
Hillmorton,
Rugby CV21 4DU

Tel: (0788) 69447

10GHz WORKING FREQUENCY ADOPTED

The last issue of CQ-TV reported on a BATC proposal that the frequency 10.250GHz should be adopted for ATV working. Comments for and against were invited from members and all replies so far received have been in favour of the proposal. The BATC therefore has formally adopted 10.250GHz as an ATV working frequency. Members using that band are encouraged to make full use of the new frequency.

Several members have highlighted the importance of using other frequencies within the band as well, otherwise it might be thought that TV should be expected to limit itself exclusively to the working frequency. The Club assures members that it supports the use of ATV wherever it is permitted and the fullest use should be made of all bands. The main reason for selecting a working channel is that experimental equipment on a common frequency can readily be used when separate groups combine their research and test facilities.

The question of the use of the rest of the 10GHz band by ATVers will no doubt be aired further in these pages. Meanwhile members are reminded that we are secondary users and therefore, when advocating the use of other frequencies, we must ensure that they cause no interference to primary users.

THE 24CM EXPERIENCE
(A reader's eye view)

By Chris Barker G1EZJ

Although a relatively new member of BATC and devotee of ATV, I have recently had a go at 24cm, especially since I live within eyshot of the Stoke-on-Trent repeater GB3UD.

The first thing to catch my eye was a 24cm AM receiver in "Best of CQ-TV". It looked interesting and not beyond my capabilities. Then, one evening, I had a QSO with G4DVN, one of the repeater's boffins. Steve loaned me a home-brew receiver which had a similar front end to the one mentioned and this enabled me to confirm reception of the repeater at my QTH. I then had a go at building my own tuner and quite soon achieved success; a P2 picture was resolved using slope demodulation on a normal TV set. At last I was on the way.

The next step was to shell out for a BATC FM-IF board. This I did and was rewarded with little success at first. Steve kindly had a look at it for me and soon had it going nicely - it proving only marginally less sensitive than a Wood & Douglas system.

All this time I had been tying the AGC rail on the TV tuner via a resistor to -ve and by sheer cobble I decided to put in a potentiometer with the AGC pin on the slider and the ends connected across 12 volts. Bingo! after a fiddle with the pot' P4 pictures were at last received from GB3UD. Now to the next problem:

Ever tried to transmit on 2m and watch an incoming picture at the same time? No chance; not at this QTH anyway. Some sort of filter was needed but the ones I kept seeing required some degree of engineering (I can't even draw a straight line with a ruler!) so another method had to be devised. I had previously been given a length of 4mm copper tube so, with a few bent bits and some trimmer capacitors, all shoved into a tin box, I came up with a filter design for the input of the 24cm receiver. Now there were no problems with 2-metre transmissions breaking through.

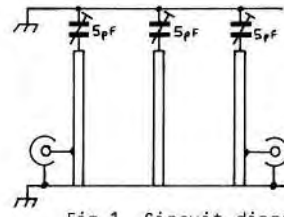


Fig.1 Circuit diagram

THE FILTER

The basic citcuit is shown in Fig.1. The principle is simply that of three series tuned circuits lightly coupled and tapped in and out at the 50-Ohm points on the lines.

Fig.3 shows the general layout of the filter components and my method of connecting the input and output coaxes. Fig.2 shows detail of the tuned line and the mechanical arrangement of the capacitor. The filter may be built on a piece of PC board or, as I did, directly into a suitable sized tin box. This makes it easier to fit coaxial connectors.

The trimmers are small 5pF film types (grey) and the lines themselves can be made from 4mm or 1/8" copper tube or some stout copper wire. If you can get this silver plated so much the better. The actual thickness of the lines is not particularly important (within reason) since any variations can be tuned out with the capacitors.

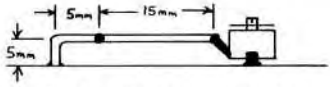


Fig.2 Tuned lines mounting

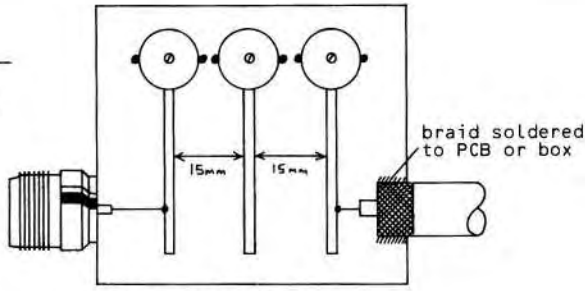
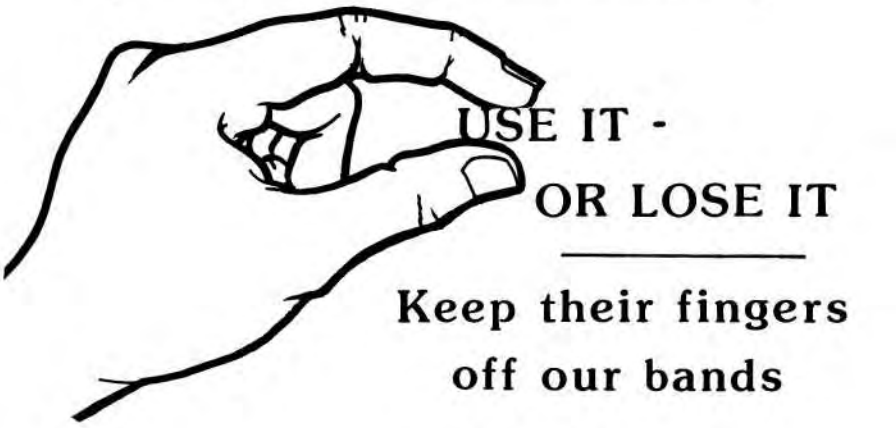


Fig.3 Plan view

ALIGNMENT

First tune into a picture without the filter connected. Now fit the filter and set the three trimmers to MINIMUM capacity. Now simply adjust the three trimmers for best received picture. If, after alignment, any of the trimmers are fully open or fully meshed, then an adjustment to the line length should be made to compensate. None of the trimmers should be at either extreme of their range. Bandwidth can be changed by increasing or decreasing the coupling between lines; bringing them closer together will widen the passband whilst moving them apart narrows the response.

I have just purchased a Solent 1-Watt transmitter and am working on it at the moment. Who knows, if you can see GB3UD, you may see me on yet.



MORE ON SCART

Following the piece in the last issue giving details of the SCART connector, member Don Reid has kindly sent me a copy of British Standard BS 6552: 1984/EN 50 049 which provides full details of the system.

Much of the text is beyond the scope of this magazine (and the space required!) but a useful table furnishes a lot more information on the individual pin functions. That table is reproduced below. The diagram on page 89 of CQ-TV 139 should be referred to for the pin assignment details.

Pin	Matching value	Test conditions and comments
1	Impedance 1k Amplitude (r.m.s value) 0.5v nominal, 2.0v maximum	For a modulation factor at the transmitter of 80% (AM or FM)
2	Impedance 10k Amplitude (r.m.s. value) 0.5v nom., 0.2v min., 2v max.	
3	Impedance 1k Amplitude (r.m.s. value) 0.5v nominal, 2.0v maximum	For a modulation factor at the transmitter of 80% (AM or FM)
4		Audio common return
5		Blue return
6	Impedance 10k Amplitude (r.m.s. value) 0.5v nom., 0.2v min., 2v max.	
7	Difference between the peak value and blanking level: 0.7v (+/- 3dB) Impedance 75-Ohms Superimposed d.c. component within 0v and +2v	Positive going signal
8	0v to +2v logical '0' +9.5v to +12v logical '1' Input resistance 10k Source resistance when pin 8 acts as an output: 1k	For a television receiver the control voltage is an input signal delivered by the peripheral equipment. Logic '0' broadcast TV Logic '1' Peritelevision reproduction.
9		Green return
10		Intercommunication data line no.2
11	Difference between the peak value and blanking level: 0.7v (+/- 3dB) Impedance 75-Ohms Superimposed d.c. component within 0v and +2v	Positive going signal

12		Intercommunication data line no.1
13		Red return
14		Intercommunication data line common return
15	Difference between the peak value and blanking level: 0.7v (+/- 3dB) Impedance 75-Ohms Superimposed d.c. component within Ov and +2v	Positive going signal
16	Ov to +0.4v logical '0' +1v to +3v logical '1' Impedance 75-Ohms	Bandwidth and time delay must be matched to those of the RGB primary colour signals.
17		Video return
18		Blanking return
19	Composite video signal: Difference between white level and synchronising level: 1v (+/- 3dB), Impedance 75-Ohms Superimposed d.c. component within Ov and +2v when the signal on this terminal is used exclusively for sync. purposes, the p-p voltage is 0.3v (-3, +10dB)	Positive going video
20	Composite video signal: Difference between white level and synchronising level: 1v (+/- 3dB), Impedance 75-Ohms Superimposed d.c. component within Ov and +2v when the signal on this terminal is used exclusively for sync. purposes, the p-p voltage is 0.3v (-3, +10dB)	Positive going video
21		Common return. Connected to reference potential and plug shield.

INTERNATIONAL ATV CALLING 144.750 MHZ

PROBLEMS WITH PORTABLE GENERATORS

By Peter Hardcastle G1COI,

Problems are often encountered when powering equipment from motor-driven generators, such as may be used in portable locations during contests or whatever. These problems vary from electrical interference from the motor electrics to transients on the AC output caused by sudden load changes. However, most frequently the problem is the apparent lack of supply voltage, even though the generator is adjusted for 240 volts. This article outlines remedial action that can be taken to minimise this low voltage problem and thus enable you to get full power from your TV linear.

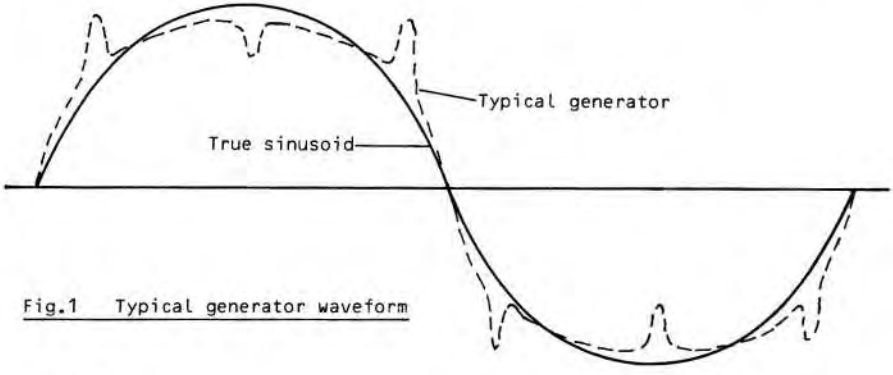


Fig.1 Typical generator waveform

BACKGROUND

Most items of electrical equipment intended for use on 240 volts AC are designed to operate from an essentially sinusoidal supply, as is available from the domestic mains. The output waveform from a typical motor-driven generator is, however, severely distorted relative to a sinusoid and is electrically different in several key respects. It is these key electrical differences which give rise to operational problems, and action must be taken to restore them to those required by the specific items of equipment. A typical waveform from a motor-driven generator is shown in Fig.1, as is the sinusoidal waveform received on the domestic mains supply.

AMATEUR RADIO OPERATION

So what are these key properties that are causing the problems? The answer is that it depends to some extent on the equipment being powered. Devices that utilise the heating effect of the supply voltage, such as valves, are primarily sensitive to the RMS value of the powering waveform. Whereas those employing the magnetic effect, such as transformers, are sensitive to the frequency of that supply. Electronic power supplies (inverters and switch mode types) are reliant on the peak voltage of the supply for correct operation.

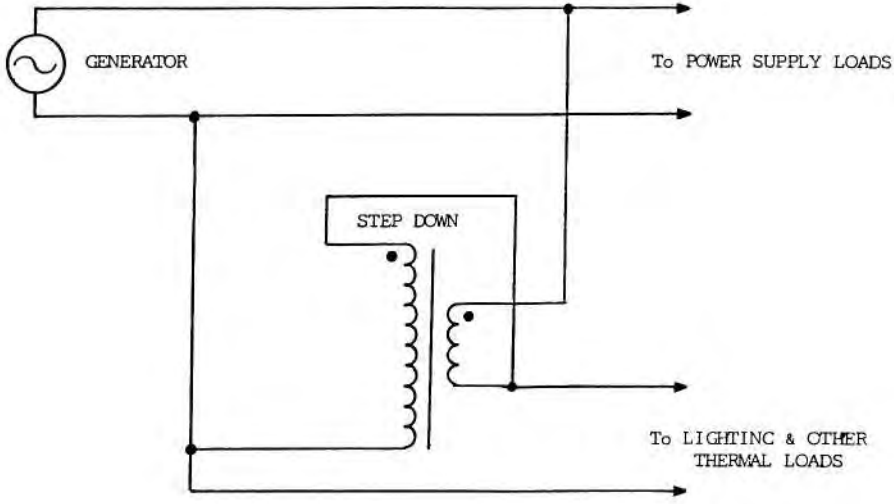


Fig.2 Fast running generator

In the portable amateur situation it is normally power supplies and lighting which are the main concern. In two instances where I checked the PEAK voltages from 240 volt AC generators, I found it to be 10 to 15% lower than that obtained from the domestic mains supply, ie around 295 volts instead of 340 volts. It is this peak voltage which determines the DC voltage on the power supply input reservoir capacitors, which, in this instance, would be 10 to 15% lower than normal. Most switch-mode power supplies will cope with this variation, but some linear regulators will not. Unregulated supplies, such as may be found in a valve PA, will be lower in output voltage by the same percentage.

THE CURE

To remedy this situation the generated peak voltage must be restored to its normal value. This can be achieved by either increasing the speed of the motor-generator, or by placing a step-up transformer in the feed to the equipment. In either case the supply voltage should be increased until the DC voltage on the reservoir capacitors is restored to the level that exists when it is supplied from the domestic mains. If a step-up transformer is used, then the step-up ratio should not exceed 10%, otherwise the danger exists of driving transformers or other magnetic devices into saturation. The advantage with the former method, is that as the speed of the generator is increased, thus increasing the peak voltage, the frequency of the supply also increases, effectively offsetting the average output voltage increase.

Having increased the peak voltage by either of these methods it will be necessary to ensure that devices utilising the thermal effect of the supply, such as tungsten lights or valve heaters, are not subjected to the new supply waveform, which will have a much higher RMS value of around 270 volts.

The two options are shown in Figs.2 and 3. The transformers can be either standard mains to low voltage types with the secondaries wired in the appropiate phase to increase, or decrease, the output voltage as required.

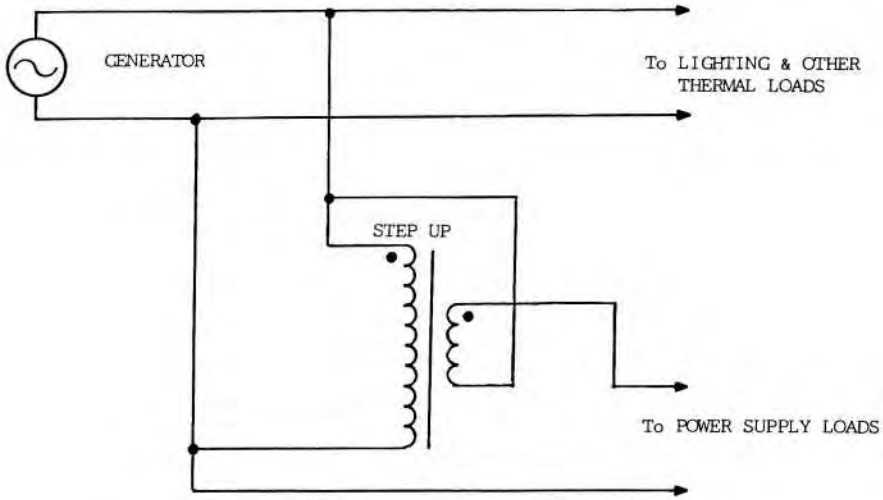


Fig.3 Step-up transformer. (generator at normal speed)

Notice must be taken of the VA rating of the transformer, the minimum value of which is calculated as shown below:

VA rating = Load Power x Percentage Voltage Change x 1.6

e.g: For a 200 Watt load and a 10% voltage change the transformer minimum rating is:

200 x 10% x 1.6 = 32VA

When selecting a transformer ensure that the secondary windings are adequately insulated, as they will be working at much higher voltages than usual.

I hope that this article may be helpful to members using, or anticipating using, generators when operating /P. Good luck and see you in the next contest!

WINTER CUMULATIVES

January 7th, 15th, 23rd, 31st

See 'Contest News' for details

MORE MSX SOFTWARE

By John Wood G3YQC

Since my review of Anglosoft's Video Titler and Display Program for MSX computers in the last issue, they have come up with two more useful programs intended to augment the original suite.

HORIZONTAL SCROLLING TITLER

A sequence of up to 950 characters can be scrolled smoothly across the screen. The characters being scrolled can be selected as either large or small, but not both.

Up to five lines of small text, three lines of large text or a mixture of both can be displayed in a 'static' (non-scrollable) area of the screen as well. There are four text styles to choose from - two large and two small. Text styles can be mixed in the scroll area whilst both sizes and styles can be mixed in the static area. Text can be displayed in the static area of the screen in any mixture of fifteen colours. A single colour for the scrolling text can be selected from any of fifteen colours. A band can be put around the text in both static and scroll areas - also in any of fifteen colours.

Sections of the scroll sequence can be paused, or paused and flashed on the screen for up to thirty seconds. Any number of pauses can be set in a sequence.

The position of both static and scroll areas can be set for the top or bottom of the screen. The static display can also be turned off.

The end of a scrolling sequence can be marked to enable it to 'wrap round' continuously without any gaps to produce a continuously scrolling display.

FONT DEFINER

This program allows you to create your own fonts and characters and save them for use with the Video Titler and Display Program. The program is fairly easy to use and is user-friendly. Suitable documentation is provided to assist in its use.

It was my intention to review both of these pieces of software but, unfortunately, after a quick look at the scrolling program my MSX computer packed up and has had to be sent away for repair.

However, I hope the descriptions provided here will give those interested some idea of the software's functions, and I'm sure that Anglosoft will be pleased to provide any further information.

At the time of writing both programs are very new and I do not have the retail prices. Again an SAE to Anglosoft will bring all the details.

ANGLOSOFT, P.O.Box 60, Coventry CV1 5SX or MEMORY VIDEO, 2 Princess Street, Accrington, Lancs BB5 1SP.

TV ON THE AIR

Andy Emmerson G8PTH

Are the times changing? Slow-scan news is starting to come in regularly (thank you) but seventy centimetres has dropped off alarmingly! Anyway, sit back and enjoy three months' activity reports ...

MICROWAVE MATTERS

'My main area of interest at present is 3cm', says Bob Platts G8OZP. Equipment at present is a 30-inch dish with DIY cassegrain feed and homebrew LNB and RX. TX is an 8mW gunn diode. On the 16th August the equipment was set up in the car park on Clent Hill, 10km south of Dudley. Much to the fascination of visitors, P4-5 pictures were received from Dave G8NND 83km away on Merryton Low, north Staffs. The path is marginal line-of-sight.

Later Dave moved to another location at similar distance but 500ft lower, not line-of-sight and with two obstructions. Again P4-5 signals were received from Dave and after a transmission of 3/4 hour duration, Dave managed to take a PO.5 from me. Funny stuff this 3 cm ... All transmisions were on 10.250GHz FM with 3MHz deviation. If any other memebers are looking for 3cm contacts I am QTHR, also I shall be active during the Autumn Vision contest.

Eric GW8LJJ wishes he could have stayed longer at Crick but had to get back to south Glamorganshire. He congratulates Viv from Bristol for her enthusiasm. On Monday, the day after the convention she was on top of a Welsh mountain working /P on 24cm. 'I was travelling back to south Wales from Rugby that day, and during my trip I called in from time to time to enquire how she was doing in the contest. She was doing very well, eight contacts on 24cm at the last count'. Well done, Viv - Contest Manager award her the prize! But Viv, why choose a Welsh mountain? Give us GWs a chance!

'I hope to join Viv and everyone else on 24 cm in the next contest as I have the homebrew receiver working and after a struggle, the transmitter oscillator is also in operation. The TX is Peter Johnson's design, sorry re-design. I etched the new-design PCB and mounted all components. Upon switch-on, the oscillator didn't start. I realised I had no ground-plane! So a piece of tinplate was glued to the back of the PCB and pins were soldered through ... still no oscillation! A 2.2pf capacitor soldered between base and emitter of the BFR91 oscillator transistor soon brought it to life. Feeding video into the unit gave good depth of modulation (deviation). I am now working on the PA stages, so hopefully GW8OOJ/P will be on 24cm. Also I am contemplating 10GHz. I look forward to working quite a few of you on the contest and Viv, sat in Bristol!

FOREIGN REPORTS

In Belgium ON9CAA and ON1WW are proposing an ATV repeater near Opglabbeek. It would have input on 24cm and output on 70. An application is with the RTT administration and we'll relay more news when we have it.

From Albany (New Zealand) our regular correspondent advises that the Wellington VHF group favours four AM 24cm channels to be used as extenders (translators) to their primary repeater (callsign ZL2WA) on 443.25 MHz in,

614.25 MHz out. ATV operators in Auckland and Christchurch, on the other hand, favour two FM TV channels instead and Ian ZL1TOQ and Ralph ZL1TBG have both built equipment from BATC designs.

The Hawkes Bay VHF group has established a new ATV repeater. Vision: 443.25 in, 614.25 out; sound: 448.75 in, 619.75 out. Power output (AM) is 5 watts, with a 15dB gain corner reflector located at Temata Peak, 300 metres above sea level. The repeater normally works as a beacon, radiating a test pattern and QSL information. A spech synthesiser on the sound channel says "614.25 MHz" followed by a series of tones and then repeats the sequence. Fascinating!

NEWS FROM OXFORD, ...

Jeff G8PX flies the flag for Oxford with a detailed report (I wish I received more like this!). He congratulates the BATC committee for its orgainsation of the Crick rally; he enjoyed it very much and thinks it one of the finest in the rally calendar. On 70cm activity has fallen off a bit but we have one newcomer who lives at Wantage, about 12 miles south of Oxford. He is G3CU and took up ATV after seeing some of the local group's pictures. He has built the BATC converter and low-power transmitter, which is boosted to 20 watts with a M/M linear. Despite the hills, P2 to P3 pictures have been swapped with G8PX. An improved aerial and masthead preamp at G3CU should give improved results.

G6ZSI lost his aerials in the gale (still on the ground), also G6YTW had damage. New aerials skyborne are promised soon. GOCAD has moved to Wallingford and has been testing out his new aerials on ATV.

Moving up to 24cm, G8SIN and G6MSQ were seen to buy the Solent 1 watt transmitter from the Worthing Group stand and G6MSQ also purchased a Bristol FM Group aerial during the Crick rally. Further news is eagerly awaited by G6ZHC, who is looking for a local to start, as it's a bit lonely on 24cm in the Oxford area.

Jeff himself started to build some hardware for a Spectrum-based SSTV system two years ago but never finished it as he was hooked on fast-scan TV. After getting inspired at Crick, he finished off the hardware and it is now working on tape only. He also has a software-only system, from Crick. As soon as he has got it working he hopes to start a local net on 144.4 Mcs with other Spectrum users. G8PX is also building the G8CGK pattern generator from the "Slow Scan Companion" and remarks on the excellent value for money of the BATC's PCBs. Namechecks for the above are GOCAD Dave, G6ZSI Eddy, G6ZHC Barry, G3CU Bert, G6YTW Tony, G8SIN Dermot and G6MSQ Chris. Thanks for the news Jeff.

... FROM GREECE ...

D. Valaris SV1UY from Byron (which I assume is a suburb of Athens) reports that SSTV activity has been quite good throughout the summer months, despite holidays and other engagements. He worked LX1DA, ZP5CCG, VO1BL, 5B4CV, OK3ZAS, ZS6BTD, I1HJP, JA8PPE, C3ISD, GI4FZD and of course Dick G4RRX and Robert G4TUK. Also DL1HBN, SP4KM and many other stations around Europe. 'It seems', he says, 'that SSTV will never die as some people say because there are many people who like it very much.'

'Here in Greece some new SSTV stations are showing up and I must mention SV1AFN, SV1UG, SV1EF and SV1VV who use Commodore and Spectrum programs. The only other person with camera facilities apart from myself is SV1OJ. I forgot

to mention SV1PC who was active last year with a home made phosphor monitor and a flying spot scanner but abandoned the flying spot scanner because it was too big for his shack. He wants to start SSTV activity again very soon. As for myself, I hope to be QRV on 70cm ATV very soon; I have already built a simple 100mW exciter from 'The Best of CQ-TV'. Thanks to Members' Services for supplying the 108MHz crystal and the PCB. The aerial will buy a 15 element quagi and a small amplifier to raise the power output to about 1 watt.'

He continues: 'I would also like to mention the SSTV plague of 20 metres. It is an ISO station (callsign supplied) who is interfering with everyone talking on 14230 kHz, including SSTVers talking about SSTV and exchanging pictures. He never listens carefully and has nearly spoiled many nice DX QSOs in SSTV including my own. I have heard that many people have written letters to him and to the IARU. In the last few days I have not seen him QRMing but saw another SSTVer from Sardinia doing the same thing. Maybe he is his successor!'

'If anybody knows about the PCB for the Robot 400, any photographs, photocopies or the address where these can be obtained, please let me know. I will cover all costs for copying and postage. Write to me at 24 Grigriou E Str, GR-162 31 Byron, Athens, Greece. Thanks.'

... AND FROM SWEDEN

Helmer Lindquist SM6CCD replied to a letter I sent to him on behalf of EATWG inviting Swedish ATVers to appoint a representative to the European ATV Working Group. Helmer sends us his support and mentions that they have no more than perhaps 10 to 12 people interested in ATV in Sweden and there is thus no ATV manager for SM. All the same, Helmer is prepared to act as intermediary.

SLOW-SCAN ACTIVITY

Sandy Pimlott G8IDE writes from St Budeaux (Plymouth) with some snaps he has taken from the screen. He uses a home-brewed SSTV monitor and has recently much improved the camera using plastic drainpipe and plant-pots. Some of his best reception has been on 14.230 MHz (20 metres).

From Treverva near Falmouth a letter comes from Roland G4UKL, who pays tribute to Richard G3WW. "Richard was the doyen of slow-scanners and will long be remembered for his patience, unfailing kindness and courtesy. He was always reminding us to follow our colour transmissions with 'just a couple of frames of 8-second black and white, for those not fortunate enough to receive colour'. The strain of selling his house and moving, never an easy thing to do at his age, put him off the air for quite a time and must have worried him." The contest referred to by G2BMI was in fact organised by IVCA and was won by the same HA1ZH mentioned by Jim. Not surprising, considering he was on the air day and night for seven days - we wondered when he slept! There will be another marathon contest early in 1988 and I will send details to CQ-TV. The contest is almost 100 per cent SSTV-orientated, with very few ATV entries. (See major results elsewhere in this issue).

Roland also tells us of the International Visual Communication Association, an informal association of amateur radio enthusiasts with a high interest in all forms of visual communication. Roland is UK correspondent and won a trophy in the contest. There are members, he says, in every country where visual communication is allowed. It is located at 99 Oenoke Lane, New Canaan, Conn 06840, USA. The object of the association is the enjoyment of our hobby by the interaction amongst members and amateurs in general, accomplished by nets,

contests, newsletters, dissemination of technical information and just plain fun.

An annual donation of $10 is asked ($100 buys a life membership) to cover the cost of printing, postage and trophies. Members on low incomes or having a hard time donate what they can afford.

Through ICVA, he continues, it will eventually and hopefully be possible to net all continents with better-sited stations relaying transmissions. An interchange of pictures with, say, India and the Pacific will be possible via a relay in Switzerland. The international spread is well illustrated in the list of successful contest participants. I have, on several occasions, enjoyed a two-way colour picture exchange with stations in the Los Angeles area via a Florida station ... as we say, all good fun and in keeping with the experimental clause in the licence.

Just for information, my station in south-west Cornwall consists of Trio TS940S (modified by Lowes), Yaesu FT102 as backup, TL922 linear, 3-element tri-band beam. Also Robot 1200C modified to store four high-resolution colour pictures and SC1 compatibility (courtesy of G3OQD), BBC Master computer with Philips High-res colour monitors. Pictures can be transmitted from camera, domestic TV, computer graphics, or from disc and tape library, with immediate switching between sources. The Robot is almost entirely controlled by the computer. It will, for example instruct the Robot to transmit any number of frames (sequentially from memory) at any speed, in either Robot or SC1 format. The same program will also, if requested, send the VIS line twice to ensure sync setting.

Fast-scan ATV is a dead duck in this area of Cornwall; too much granite to soak up the RF and no interest as far as I am aware. The scene with SSTV is better; there are now four stations with colour capability and a dozen more with black/white, using Spectrums and DRAE.

YLs ON ATV

We must just welcome into the fold Linda, G1ZLT, who has recently received her licence. Together with ATVer husband G1GPE they can be heard on '750 in the Midlands most evenings and seen on 70 and 24cm ATV as well.

We already know about our lady contest specialist, Vivian G1IXE from Bristol but I can't help wondering if there are any more lady TVers around? Perhaps we should start a ladies page in CQ-TV! any offers to the Editors.

LAST MINUTE REPEATER NEWS

Just in comes news of a new ATV repeater proposal for the HULL area. It will be FM only and will use omni-directional aerials. Some of the hardware is already built although the group reports possible problems with radar interference. The proposed callsign is GB3HL and anyone interested is invited to contact Andy Goy, G4HJD at 200 Hessle Road, Hull, North Humberside HU3 3BE. Tel: (0482) 225437.

SIGNOFF

That's it for this time: does anyone want to redress the balance on 70cm? Let's have plenty more reports in time for the next issue please and send them to me at 71 Falcutt Way, Northampton, NN2 8PH - thanks!

LET'S BUILD A REPEATER
Part-2

By John Wood G3YQC

Unless one's repeater group has a logic man or computer boffin the question of effective repeater control can be rather daunting. I developed the following simple logic circuit originally to control GB3GV (Leicester), and found it so successful that the same system has been adopted by GB3RT and GB3UD as well.

One feature I thought worth including was a 5-second (adjustable) 'dropout' delay. This is a form of hysteresis and means that, when a signal is removed from the repeater's input, (or falls below the sync detect threshold), the repeater remains in talkthrough mode for the duration of the delay period. In this way the repeater is prevented from tripping in and out when stations are perhaps tuning up, getting themselves on frequency or the signal is subject to flutter or rapid fading.

Several items of circuitry have been brought together on this single card as they are all inter-related and they may be itemised thus:

1. A master clock oscillator with adjustable speed control.
2. A 2-minute timer to determine the repetition of a sound identification sequence.
3. A 5-second timer and 'one-shot' multivibrator to set and control the drop-out delay circuitry.
4. An EPROM based morse code generator for callsign and locator identification.
5. A keyed sine-wave oscillator providing an audio ident signal.
6. An on-board voltage regulator.
7. A 'talkthrough active' indicator.

These circuits may be briefly described as follows:

1. CLOCK OSCILLATOR - IC1. This is a standard oscillator, based on an NE555 timer i/c, whose frequency is set by the components associated with pins 2, 6 and 7. The potentiometer fine-adjusts the frequency and may be set for the desired CW keying speed.

2. 2-MINUTE TIMER - IC2. This timer uses a programmable timer i/c which is capable of a wide range of timings depending on the state of its programming pins. In its present mode the timer is set for 2-minutes. This is the overall duration of the repeater's audio cycle. Various gates in i/c 7,8 and 9, in conjunction with the EPROM, determine the actual sequence of events. This sequence is: CLOCK PULSE - EPROM DELAY - START CODE GENERATION - EPROM DELAY - ENABLE CONSTANT TONE and back to the next clock pulse after 2 minutes.

3. 5-SECOND TIMER AND ONE-SHOT - When a valid video signal is received the SYNC DETECT line goes high. Gate IC9c is disabled by IC7d holding the repeater in 'talkthrough' mode. A differentiated pulse is passed to IC3 pin-6 (trigger input).

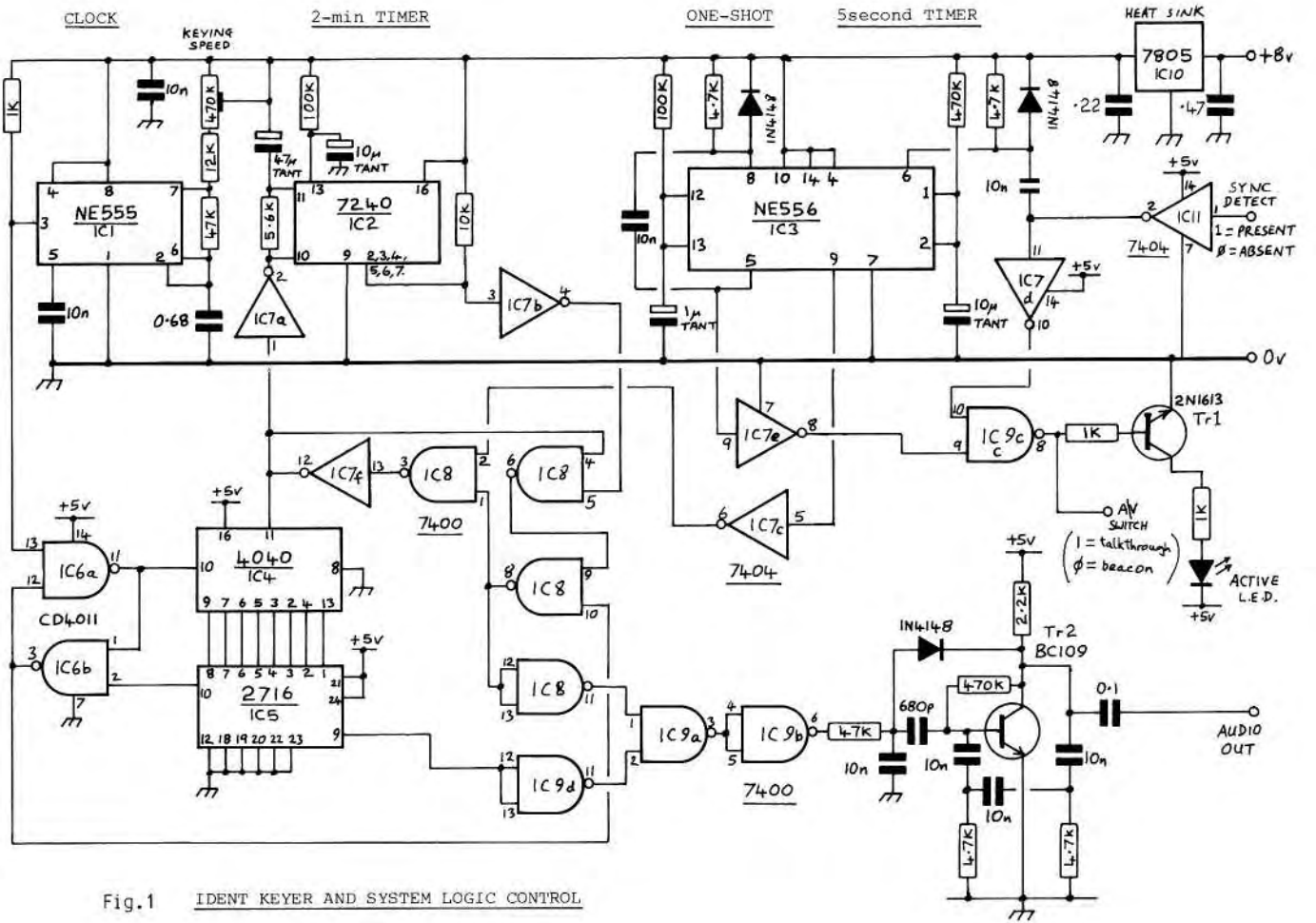


Fig.1 IDENT KEYER AND SYSTEM LOGIC CONTROL

IC3 is a dual timer. The trigger pulse sets the five second timer which, when it times out, sends its output (pin-5) low, this enables IC9c and switches the repeater to 'beacon' mode after five seconds. Tr1 provides a visual indication when the repeater is in talkthrough mode.

The output is also differentiated and used to trigger the second timer (one-shot), this produces a pulse at its output (pin-9) which is routed through IC7c to the morse code generator.

4. MORSE CODE GENERATOR - IC 4,5 and 6. The program to determine the morse code identification characters are resident in the EPROM IC 5. A clock pulse is sent to the binary counter, IC 4, whose outputs address the data in the EPROM in the correct sequence and at the correct speed. Reset is accomplished by the various gates associated with pin 11 of IC 4.

In beacon mode the repeater outputs a constant tone when the morse message is not being transmitted.

5. SINE-WAVE OSCILLATOR - Tr2. This keyed oscillator is driven from the TTL signals presented to it from the morse code generator. The circuit delivers a near sine-wave at its output and has been specially designed for this type of application. The output audio signal is applied to the intercarrier sound generator module, whose input has been matched to accept this signal. A 10k level adjust control may be provided at the A/V switch input or at the audio output as required.

6. VOLTAGE REGULATOR - IC10. In the interests of isolation an on-board, three-terminal voltage regulator is provided to supply all the circuits. Adequate decoupling of the supply rails is provided in order to maintain unconditional stability.

THE MORSE CODE E-PROM

IC5 is a 2716 E-PROM, only one half of which holds the message data.

The system uses just two bits of each byte in the memory; bit zero controls the tone; a '1' is key down and a '0' is key up. Bit one controls the length of the message; a '1' signals the end of message and a '0' indicates that there is more to come. Only the first 256 bytes are uses and, as each byte represents one 'dot' period, this means that a message of around 20 seconds at a speed of 12 wpm is possible. Nevertheless, this is adequate for most purposes, and in any case most ident's are run slower than 12wpm.

Data for the EPROM can be assembled quite easily by hand. Remember that in morse code the length of time between dots or dashes in any character is equal to one dot. The length of time between the characters of a word is three dots and the length of time between words is six dots.

Each byte in the EPROM represents one dot length. If the dot is to sound (key-down) then the byte must contain FD (hex) whilst key-up dots contain FC (hex). At the end of the message all remaining bytes must contain FF (hex).

Fig.2 is an example message which contains the following "DE GB3RT IN RUGBY IO92JH". The first block of code contains a run-in key-up period of ten dot periods (FC hex) followed by three FD for the dash, FC to separate it from the first dot of the letter 'D' and so on. Note that the programmer of this message has chosen to use a spacing of seven dot periods between words instead

of the more usual six, and has used unequal length spacing before and after the message. These are matters of personal preference.

```
8000 FC FC FC FC FC FC FC FC     8080 FD FC FD FD FD FC FD FC
8008 FC FC FD FD FD FC FD FC     8088 FC FC FD FD FD FC FD FC
8010 FD FC FC FC FD FC FC FC     8090 FD FC FD FC FC FC FD FD
8018 FC FC FC FC FD FD FD FC     8098 FD FC FD FC FD FD FD FC

8020 FD FD FD FC FD FC FC FC     80A0 FD FD FD FC FC FC FC FC
8028 FD FD FD FC FD FC FD FC     80A8 FC FC FD FC FD FC FC FC
8030 FD FC FC FC FD FC FD FC     80B0 FD FD FD FC FD FD FD FC
8038 FD FC FD FD FD FC FD FD     80B8 FD FD FD FC FC FC FD FD

8040 FD FC FC FC FD FC FD FD     80C0 FD FC FD FD FD FC FD FD
8048 FD FC FD FC FC FC FD FD     80C8 FD FC FD FD FD FC FD FC
8050 FD FC FC FC FC FC FC FC     80D0 FC FC FD FC FD FC FD FD
8058 FD FC FD FC FC FC FD FD     80D8 FD FC FD FD FD FC FD FD

8060 FD FC FD FC FC FC FC FC     80E0 FD FC FC FC FD FC FD FD
8068 FC FC FD FC FD FD FD FC     80E8 FD FC FD FD FD FC FD FD
8070 FD FC FC FC FD FC FD FC     80F0 FD FC FC FC FD FC FD FC
8078 FD FD FD FC FC FC FD FD     80F8 FD FC FD FC FC FC FC FF
```

Fig.2 EPROM MESSAGE LISTING

Finally, don't forget to include at least one byte of FF (hex) at the end of the message.

In order to assist those who may find difficulty in programming an E-PROM I am writing a computer program to help. It should be fully operational by the time this appears in print and members are invited to send an SAE, or phone for details. There will be a small charge to cover expenses. My thanks to Geoff Mather, G8DHE for helping with the programming system.

SYNC DETECT

To access a TV repeater one has to present the input with a 625-line TV signal. Obviously this must be detected (rejecting everything else) and cause the repeater to switch over accordingly. The best way is to look for the presence of synchronising pulses on the input signal.

Fig.3 shows a circuit which is widely used in this country, it is believed to have originated with the Worthing group's GB3VR and generally works well.

IC1 is a simple sync separator which removes the vision information from a composite signal derived from the repeater demodulator. The resulting sync pulses are passed to a phase-lock loop (IC2) whose VCO is set to free-run at line frequency (15.625KHz). Upon receipt of 625-line sync pulses the VCO locks up and an output - at TTL logic level - is produced which is used to trigger the logic system.

There is only one control on this circuit and that sets the VCO frequency to 15.625KHz. The control should ideally be set (with no input) with the aid of a frequency counter, but if necessary may be adjusted whilst receiving a video signal on the input.

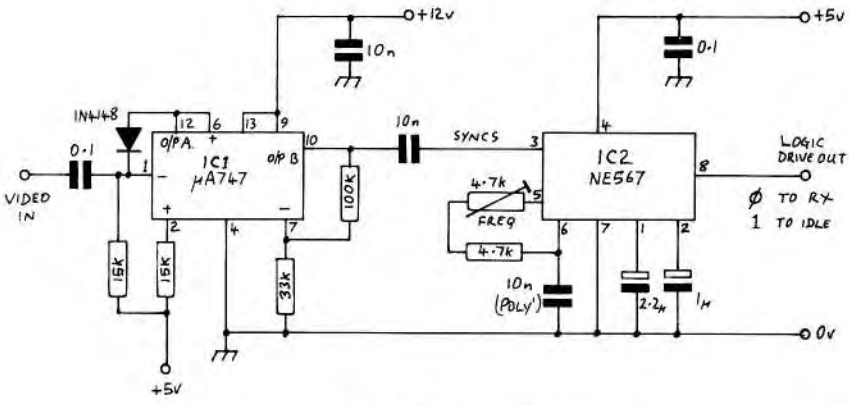


Fig.3 SYNC DETECT CIRCUIT

I personally found the circuit in Fig.3 to be a bit sensitive to noise and extraneous signals (especially when the receiver is co-sited with other transmitters), and it has no threshold or sensitivity adjustment so one can't set for a particular level of input signal. Also, the sync separator, although reasonable, often delivered less than perfect syncs which sometimes fooled the PLL. I therefore developed the circuit in Fig.4 in an attempt to improve on the original design.

A simple sync separator is used to strip off the video from the composite input. Tr1 is a clipper whose input bias resistor is made deliberately large so that the base current is low - it conducts only on sync tips. Tr1 is actually acting as a DC restorer. The zener diode at the base of Tr2 is included only to clip off some picture content when the input signal is low. The 100pF capacitor is included to remove subcarrier or high frequency noise.

The resulting sync pulses are coupled to a parallel tuned circuit at line frequency which, in fact, uses an ordinary 88mH toroid. This filtering is very effective in reducing input noise and thus improving the overall sensitivity to incoming syncs. The signal is buffered by a high-impedance input FET and fed via a 'threshold' or 'sensitivity' control to an NE567 IC in a phase-locked loop decoder circuit.

The detection frequency is set to 15.625KHz by the 10k control and, when this frequency is detected, pin-8 goes low. The output and low-pass filter capacitors (pins 1 and 2) have been made deliberately large to ensure a clean transition of the output level. The more usual (lower) value capacitors allow a high degree of pulse 'noise' at the output, particularly when weaker signals are being received.

Because the NE567 has an open-collector output, a pullup resistor has been included to enable testing of the circuit without the need for connection to a logic gate load. The action of the 'sensitivity' control is fairly flat although it could be tailored to a particular range by providing a different resistive divider.

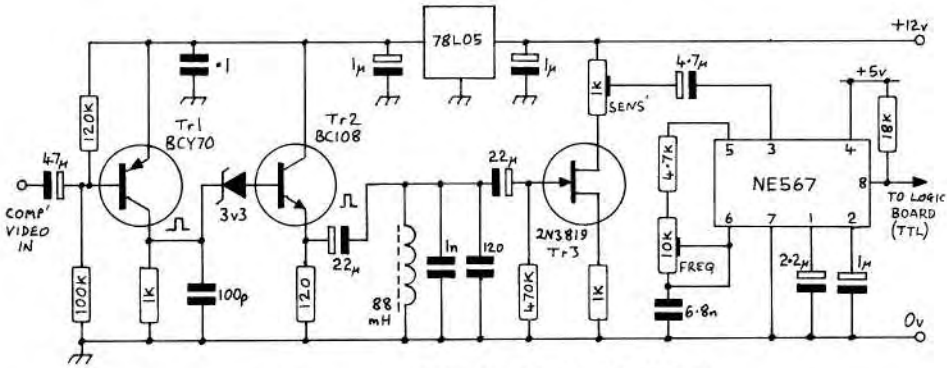


Fig.4 IMPROVED SYNC DETECT CIRCUIT

88mH toroids are available from the British Amateur Radio Teleprinter Group. The 7240 is available from Electromail (RS Components). Most other components should be available from Bonex Ltd.

Next time I hope to look at at least one computerised control system and will also describe some audio/video switching circuits.

IN FRONT OF THE TUBE

Part-8

By Peter Delaney G8KZG

Over the past two years we have looked at lenses for television, (parts 1, 2 & 6), colour separation systems, (part 3), optical special effects, (part 4), lighting (part 5), and captions (part 7). However, all this optical know-how, or the captions are not the most important thing to put in front of the lens, or 'in front of the tube'. In this, the final part of the series, we take a look at presentation.

It might seem that the way amateur television is presented does not matter. Thinking about who might see it however, will soon show that your audience might be greater than you imagine! Many domestic TV sets will tune 70cm directly. This means that, unlike the other modes of amateur transmissions, the viewing public at large may, and do, find amateur TV signals. Of course they are used to the standards of the professional broadcast channels. Whilst we cannot hope to compete with them, ATV will not create a favourable impression if our presentation is poor. In addition, if they see GOZZZ it is much more easily identifiable than when they hear GOZZZ on a short wave set.

Then there are ATV repeaters springing up all over. Using one of these you will almost certainly have a captive audiance of amateurs, rather than just a single individual, so it is worth taking a bit more trouble.

Without trying to build an elaborate 'Wogan' style set, how can the average amateur create a better impression of what amateur television is all about? To the public, our hobby conjures up a vision of lots of boxes of junk, and the 'spaghetti' of wires that John Cleese tells us we don't need in our living room. In many cases the pictures that are seen 'on air' not only confirm this idea, but look more like a secondhand TV shop window, with more 'spaghetti' than an Italian restaurant. Try to arrange the monitor stack neatly - do you really need half a dozen 26" sets - all different styles and sizes of course? If you do need to run this collection, then try to put them out of camera shot. This actually is not difficult, for if the camera is put alongside the TV sets, it can see the operator, and he/she can see the monitor stack. Wiring can be neatly stowed around the back of the equipment. If it is necessary to change connections from time to time, a neat patch panel is preferable to umpteen tangled coax and multicore leads. It is also more efficient, as you don't spend half an hour working out which lead is going where. If the shack equipment can be mounted in a rack or in diecast boxes of a standard size/style/finish, tidily arranged on a shelf, then a better impression is created.

The mic should not be dominant.

Following on from this, the background should also be considered. Unless the shack is being described for another amateur station, the equipment does not need to be in view. There used to be a school of thought that there should be an AC background. This was largely due to the way the electronics processed the picture signal. Visually, however, a strongly patterned background is distracting. So is a cluttered one. If the background were made a plain colour the possibility exists of keying in a background from

another source on the vision mixer. Apart from this, try to keep the image 'easy on the eye', by avoiding strong contrasts or fine fussy detail. A suitable length of curtain material can make a convenient backdrop - in the way that a cyclorama hides the walls, cables, etc in a professional studio.

One very common feature of amateur television transmissions is the microphone. It should not be so dominant in the picture that it is distracting. The brain uses signals from both eyes and ears to interpret a message. Many microphones are held so close in front of the face that the mouth cannot be seen. Such tecniques are appropriate to a commentary on the Grand National, but not to a person in shot. The microphone can be positioned away from the face, possibly on a bench or suspended just out of shot above the head. The professionals use a mike boom, but a simple arrangement that gives a vibration free mounting is all that is needed. An elegant alternative is to use a tie-clip microphone, such as newsreaders wear. With a reasonable length of lead, the wearer is free to move whilst keeping at a standard distance from the mike. This type of microphone can be obtained fairly cheaply, or an electret capsule can be mounted on a crocodile clip for a home-brew version. The capsules are often available for a pound or so at amateur rallies. Using one of these also enables hands to be free to fill in the log-book, operate the equipment, set up captions, etc.

Don't make your transmissions too long.

Some amateur productions do not seem to flow smoothly. Of course, we do not want a scripted monologue, but some 'presenters' seem to move from one idea to another, and back again. If the production is the compilation of a video-tape of an event, or similar, then a simple storyboard type script will help to put the programme into a logical sequence. On a 'live' transmission this is more difficult, but becomes easier with a little forethought and practice. This is particularly true when a station shows some material previously shot on video tape. "Well I know it's here somewhere", as you see clips of beaches in Spain, mountains in Scotland, or Morris men at the local county show whilst waiting to see the bit about the last contest. By the time it has been found, the viewer has lost interest! Try to organise and catalogue the tapes, with starting counter numbers, so that they can be found quickly. If possible, preview the video tape extracts on another monitor so that it is not done 'on air'. It all helps to create an impression of an amateur presentation that is not 'amateurish'.

The length of an amateur 'programme' is often a subject for debate. In some areas there is relatively much more ATV activity than others, but the general principles are much the same. It has been said that a shot should not be held the same for more than 18 seconds. For broadcast stations, with their multi-camera studios this is easier than for the ATV station. Frequent unnecessary cuts are distracting, but the same monotonous head and shoulders shot for 15 minutes between transmitting the regulation callsign... followed by..!! is boring for anyone to watch. Unfortunately, such is quite common (normal?) from some amateur stations. Some do break it up with their 'favourite' video. This can be just as bad as BBC repeats. Looking at someone

elses holiday snaps, especially if in an unknown location, can be boring. Just because they move on video does not make them less so - especially if you have seen it before. The idea is to keep the transmission of interest, so an epic documentary is not a good idea.

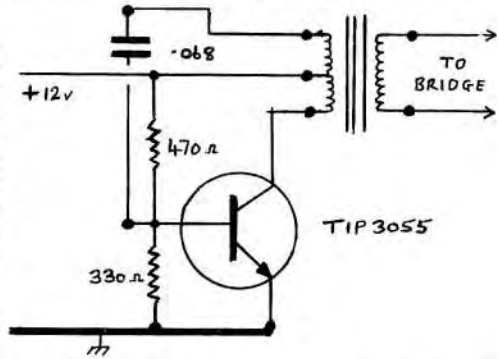
It often seems that the transmissions having the jumble of equipment in view, with the spaghetti tangle of wire, are also the ones who cannot find that video clip of the cat up the tree, and have captions that are quickly scribbled. With a little care, thought and preparation the effect of their video could be made more pleasant to watch.

It is not claimed that any of the ideas in this series are new, but, hopefully, they will encourage people to experiment with aspects of television other than just the electronic. Anyone with new or alternative ideas is invited to send them to the Editor for possible inclusion in CQTV.

A 'PORTABLE' INVERTER

By Bob Webb G8VBA

Having built the CQ-TV TVRO board for FM-TV (CQ-TV 135), I discovered the need for an inverter supply to run the gear portable for 24cm contests etc. This simple little circuit will deliver around 25v DC for 12v in which is about right for the 18v regulator and, of course, is also suitable for a 12v one as well.



The heart of the inverter is a salvaged switch-mode PSU transformer from an ITT CVC-20 colour TV but, no doubt, others would be suitable. These transformers are run at about 15KHz quite efficiently. Avoid using conventional 50Hz mains transformers if at all possible since they will impair the efficiency.

In the prototype a TIP3055 was used on a small heat sink which ran very hot, also the output voltage dropped with rising temperature. A 7.5" x 4" flat type heat sink was fitted external to the box and this only gets slightly warm after several hours running. Lowering the value of the 470-Ohm resistor will increase the output voltage, but be sure not to exceed the recommended input voltage of the 7812 regulator.

The output winding on the transformer is fed to a bridge rectifier normally used for 50Hz operation, but diodes such as BYX 71/600 in a bridge formation would be more suitable. The DC voltage out of the inverter waries considerably with the current drawn by the load, but the original objective was achieved.

Another use for a 28v supply is for RF power amplifiers. There are a number of microwave transistors that are designed for 28v operation such as 2N4429/30/31. These are available cheaply at rallies.

REVIEW

LMW 1.3GHZ PRE-AMP

By John Wood G3YQC

The LMW Electronics pre-amplifier; 1296PP4, is a wideband low-noise receive amplifier which is designed to cover the 1.3GHz amateur band as well as lower frequencies.

The amplifier is available either ready built or in kit form. The module used for this review was supplied by the distributors - Messrs Bonex Ltd - in kit form in order that its ease of construction and testing may best be determined.

MANUFACTURER'S SPECIFICATION

Gain at 1296MHz	13dB*
Noise figure at 1296MHz (best)	1.6dB**
Frequency range	500 - 1500MHz
Power requirements	+13v dc (nominal)
PCB size	106 x 60mm

* The Bonex catalogue states 15dB.
** The Bonex catalogue states 1.7dB.

DESCRIPTION

The kit comprises an etched printed circuit board in PTFE which has been pre-drilled where necessary, and a set of components which includes special earthing pins.

Printed striplines are used for all inductors as well as two printed capacitors. The input and output ends are not identified on the board although they are clearly marked on a layout diagram.

Two pages of documentation accompany the kit; the first gives general construction details, pointing out critical operations and components where necessary, and giving circuit and layout diagrams. The second deals with "low-inductance launches for UHF/SHF use", ie. the correct fitting of coaxial connectors to convey the signal in and out of the amplifier.

CONSTRUCTION

The various steps in construction were followed quite easily from the information provided. The holes for the two emitter grounding pins had to be opened out to the correct size to allow them to be fitted.

There are four small plate ceramic capacitors which have to be fitted using minimum lead lengths. One leg passes through the board whilst the other is bent out at right angles and laid flat onto the top of the board. The components supplied, however, were the type that have fairly thick, rigid leads which, when bent out close to the body, almost invariably break the capacitor's protective coating. If the popular thin-lead types were provided instead then this breakage would be much less likely. I had to supply my own replacement components.

The most tricky parts to fit are two tiny chip ceramic capacitors, one each at the input and output. Instructions for fitting are given and I must emphasise that some care is neded here not to overheat them. In practice I found their fitting quite easy. There is one select-on-test resistor although a typical value component is supplied. There are no coaxial connectors supplied with this kit so these must be provided before testing can take place.

LAB' TESTS

The gain measured at 1296MHz was just over 12dB and Fig.1 shows a plot of gain versus frequency between 900 and 1600MHz. The response curve continues LF almost flat down to 600MHz and at various levels between +15dB and +10dB down to 100MHz, after which the gain falls off fairly sharply.

Noise figure measured with the S.O.T. resistor supplied (15k) was just under 3dB, this with a device current of 10mA. Reducing the current to 7mA (as recommended in the documentation) reduced the noise figure to around 2.5dB. Similar figures were obtained over the entire 1.3GHz amateur allocation.

The amplifier is powered via an on-board 9.1v zener regulator. A variation in applied voltage between 10 and 16 volts had little effect on its performance.

The test equipment used for these measurements were:-

Wiltron 640 RF analyser.
Hewlett Packard 8559A spectrum analyser.
Magnetic AB 117B noise figure meter.
Magnetic AB 125A solid-state noise source.
Ailtech 136 precision test receiver.

CONCLUSIONS

The noise figure performance falls somewhat short of that specified. The figure of 1.6dB is close to the device manufacturer's performance figure which was not being realised on the review sample. The gain, although slightly lower than that specified, is nevertheless adequate for most purposes.

The printed circuit board is quite well produced and the use of PTFE probably aids the overall performance, although this no doubt contributes quite a lot to the amplifier's cost.

I find it strange that since so much importance is placed upon the need for correct coaxial terminations, to the extent of producing a complete page on the subject, and even recommending a particular manufacturer, these essential items are not supplied as part of the kit.

A variable capacitor is placed at the signal input which, according to the text, is adjusted for best noise figure. In practice (on the test equipment) this trimmer did little to the performance except to reduce the overall gain as capacity increased. No significant effects on noise performance were noted although checks were only made over the 1.3GHz band. It is probable however

that the capacitor would prove useful when matching (say) an aerial or other amplifier to the pre-amp.

The amplifier is listed in the Bonex Electronic Components catalogue (black cover). The illustration is in fact that of a GaAsFET amplifier and shows a

boxed unit complete with coaxial and power input connectors. It does not however make it clear that these items are NOT included with the bipolar kit. Perhaps the ready built amplifier is complete? I think the advertisement is therefore somewhat misleading (although I am sure accidentally).

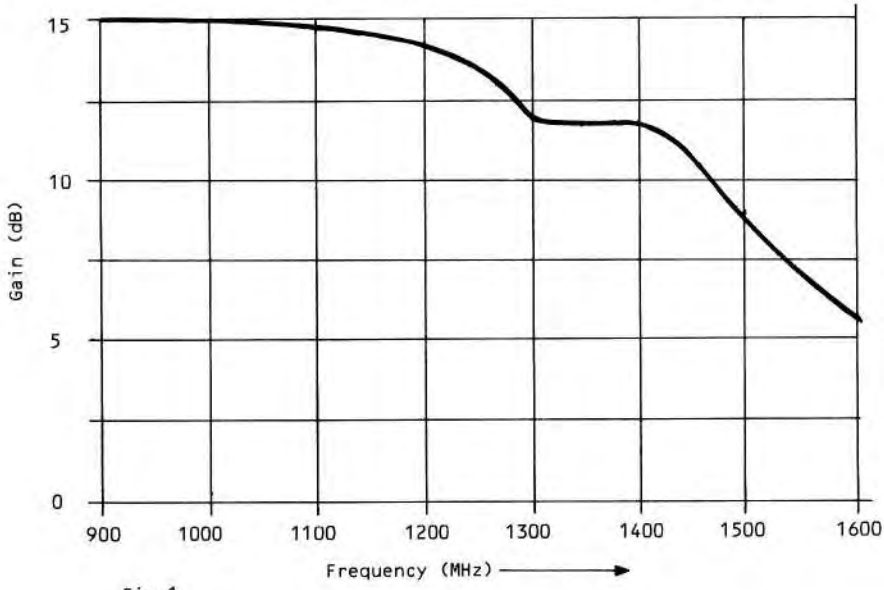


Fig.1

Overall I liked the amplifier and felt that it stands up to comparisons with other similar units on the market. For amateur use it provides a useful gain, and the noise performance is quite acceptable and much better than most TV tuners. It is quite easy to build. The unit could find favour with satellite TV enthusiasts since it just covers their normal IF band - 950-1750MHz, - although the gain will have dropped off at the top end.

The documentation, although adequate, does have one or two ambiguities. There were one or two points where I thought a little more explanation would have been useful whereas some things I felt to be over described. The grammar was not the best I have seen and it was largely this I felt which produced the ambiguities. There were also one or two spelling mistakes - now I'm being hyper-critical!

At the listed price of £25.30 for the kit and £36.80 ready built (VAT and postage extra) it represents reasonable value for money and can be recommended for ATV use.

My thanks to messrs Bonex Ltd for supplying the review kit and for kindly donating it to the GB3RT ATV repeater group.

Bonex Ltd., 102 Churchfield Road, Acton, London W3 6DH.

TV REPEATERS.....

An overseas list

Following on from the UK repeater list in the last issue, we take a look this time at ATV repeaters in other countries. The following list has been compiled from information in 'Television' and 'Radio & Electronics World' magazines and from Andy emmerson G8PTH, for which many thanks.

If any discrepancies or omissions are spotted the editors would be very glad of the details please.

CALL	INPUT/OUTPUT DETAILS	LOCATOR
	AUSTRIA	
OE5XLL	434.25MHz AM in, 1280MHz AM out	JN67CC
	WEST GERMANY	
DB0BM	434.25MHz AM in, 1285.5MHz AM out	J030EW
DB0CD	1270MHz FM in, 434MHz AM out	J031MO
DB0DN	434.25MHz AM or 2343MHz FM in, 1285.5MHz AM out	JN57JQ
DB0DP	434.25MHz AM in, 1285.5MHz AM out	J043JC
DB0EL	1252.5MHz AM in, 434.25MHz AM and 1278.5MHz FM out	J041AI
DB0FS	433MHz AM or 1252.5MHz AM in, 1285.5MHz AM out	J043XO
DB0GY	2343MHz FM in, 1285.5MHz AM out	JN47RR
DB0IV	2395MHz FM in, 1275MHz FM out	JN58JH
DB0JJ	1285.5MHz in and out (store and forward repeater)	JN48DS
DB0KO	434.25MHz AM in, 1280MHz AM out	J030JX
DB0LO	434.25MHz AM or 1242.5MHz AM in, 2335MHz FM out	J033RF
DB0NC	434.25MHz AM or 1242.5MHz AM in, 1278.5MHz AM out	J043AE
DB0NF	434.25MHz AM in, 1285.5MHz AM out	JN69IH
DB0NK	1252.2MHz in, 1285.5MHz out	JN39TE
DB0NL	1252.5MHz AM in, 434.4MHz AM and 1278.5MHz FM out	J0320H
DB0OV	2335MHz FM in, 1285.5MHz AM out	J043FM
DB0PA	2322MHz in, 2405MHz out	JN680W
DB0QJ	1246.5MHz FM in, 434.25MHz AM out	J040CW
DB0QP	434.25MHz AM in, 1285.5MHz AM out	JN68HI
DB0RG	434.25MHz AM in, 1285.5MHz AM out	J044SQ
DB0RV	434.25MHz AM or 2335MHz FM in, 1285.5MHz FM out	JN37TO
DB0TS	1245.7MHz FM in, 2372MHz FM out	J042AE
DB0TT	1242.5 AM or 1275MHz FM in, 434.25 & 2334.5MHz FM out	J031SK
DB0TV	1252.5MHz in, 1285.5MHz out (planned)	J040FF
DB0TW	1241.25MHz AM in, 434.25MHz AM out	J042GA
DB0TY	1247.75MHz FM in, 2405.5MHz FM out	J040BC
DB0YQ	1252.5MHz in, 1285.5MHz out	JN69CQ
	LUXEMBOURG	
LX0ATV	1252.5MHz FM in, 434.25MHz AM out	JN32AL
	NETHERLANDS	
PI6ATR	1252MHz FM in, 1285.5MHz AM out	J031JW
PI6EHV	434.25MHz AM in, 1252MHz FM out	J021TH

AUSTRALIA

CALL	INPUT/OUTPUT DETAILS	AREA
VK2RTG	(no information at present)	Gosford
VK2RTN	426.26MHz in, 579.25MHz out	Newcastle
VK1RTV	426.25MHz in, 579.25MHz out	Canberra
VK2RTS	444.25MHz in, 579.25MHz out	Sydney
VK2???	(no information at present)	Orange
VK2RTW	444.25MHz in, 579.25MHz out	Wagga
VK3RMZ	426.25MHz in, 579.25MHz out	Bendigo
VK3RTV	444.25MHz in, 579.25MHz out	Melbourne
VK4RAT	444.25MHz in, 579.25MHz out	Townsville
VK4RTV	426.25MHz in, 579.25MHz out	Brisbane
VK5RCN	426.25MHz in, 444.25MHz out	Central North
VK5RCN	579.25MHz in, 444.25MHz out	Central North
VK5RTV	426.25MHz in, 579.25MHz out	Adelaide
VK5RTV	444.25MHz in, 579.25MHz out	Adelaide
VK5RWH	444.25MHz in, 1246.25MHz(AM)	Hockham
VK6ROO	426.25MHz in, 579.25MHz out	Perth
VK6RUF	426.25MHz in, 579.25MHz out	Perth
VK7RAE	444.25MHz in, 579.25MHz out	Devonport
VK7RTV	444.25MHz in, 426.25MHz out	North West

NEW ZEALAND

443.25MHz in, 614.25MHz out	Belmont
1251.25MHz in, 443.25MHz out	Gisborne
1251.25MHz in, 443.25MHz out	Kaiti Hill

SSTV TUNING INDICATOR

By John Brown G3LPB

By far the most important consideration in receiving slow-scan pictures is that of correct tuning, especially where the syncs are concerned. If the syncs are correct then the video will be too.

I have used the circuit shown here for a long time and found it to be absolutely reliable, even when receiving 96-sec. colour transmissions. It is cheap and easy to build and is straightforward to adjust.

CIRCUIT DESCRIPTION

The circuit diagram is shown in Fig.1. SSTV sync pulses are fed to the input and an adjustable level then passed to IC1. IC1 is a phase-locked loop decoder whose detection or 'free-run' frequency is set to SSTV sync frequency (1200Hz) by VR2. When this frequency is present at the input (indicating correct tuning), the output pin (8) changes its logical state and illuminates the LED indicator.

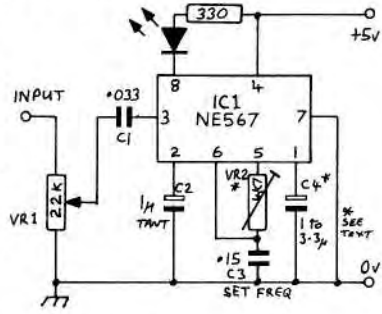


Fig.1 Circuit diagram

CONSTRUCTION

The unit may be constructed on a piece of Veroboard or on a custom-made printed circuit board.

Although a NE567 IC is used for descriptive purposes there are many makes which can have different prefix letters, or even none at all. VR1 may be a standard preset although I use a multiturn component. Likewise for VR2 although the multiturn might prove easier to adjust accurately. C3 can be made-up by connecting a 0.1 and 0.05 in parallel. The LED is a panel mounted type and is fairly non-critical.

ADJUSTMENT

After thoroughly checking the circuit, connect the input to a 1200Hz audio oscillator, set both presets to half-way and apply power.

Adjust VR2 until the LED lights, then reduce the input level and adjust again, continue in this way until the signal is lost and the led does not light. This procedure sets the free-run frequency most accurately and ensures maximum sensitivity. Alternatively IC1's frequency may be set with the aid of a frequency counter.

Next the filter bandwidth should be set: This is accomplished by tuning the audio source off to one side and observing the frequency at which the LED extinguishes. Do this again but in the opposite direction. The overall bandwidth may then be calculated by taking the sum of the two frequency

variations from 1200Hz - we are aiming for around 100Hz. The filter bandwidth may be adjusted by altering the value of C4, the value will normally lie between 1 and 3.3uF. During this operation the input level should be kept as low as possible consistent with reliable PLL operation.

Once these adjustments have been made the input can be connected to the SSTV receiver, using a screened lead, normally at a point after signal filtering.

Correct tuning of an SSTV signal occurs when the LED is illuminated. Remember though that as you tune over the band, through various SSB and CW signals, there will be points when those transmissions are at 1200Hz and therefore the LED will light.

About the author

G3LPB John, or Johnny Brown has, as the callsign suggests, been a radio amateur for many years. John has been interested in television almost from the start but his main interest lies in slow-scan TV.

(photo' G8CGK)

John is an experimenter and avid constructor of SSTV equipment. You will find little commercial gear in his shack and many of the circuits he has developed himself. He has written many articles for CQ-TV and had at least one major series on SSTV published in 'Short Wave Magazine' during 1979. In short John is always willing to pass on his expertise and is ready to assist others in their endeavours. He is an inspiration to many and a 'true' amateur.

IVCA WORLDWIDE SSTV CONTEST

The summer 1987 newsletter of the International Visual Communications Association carried the results of their 1987 SSTV Worldwide DX contest. In third place worldwide was GM3WIL with BATC member G4UKL coming first in his individual country table. Congratulations to both stations.

The worldwide top ten results are as follows:-

1.	HA1ZH	Hungary
2.	OK3CKW	Czechoslovakia
3.	GM3WIL	Scotland
4.	SM5EEP	Sweden
5.	5B4CV	Cyprus
6.	HB9ANT	Switzerland
7.	DJ0GF	West Germany
8.	YU1NR	Yugoslavia
9.	PY5BYE	Brazil
10.	W5ZR	U.S.A.

International Visual Communications Association

99 Oenoke Lane. New Canaan. Conn. 06840

IN RETROSPECT

COLOURISING THE CROPREDY TEST CARD - CQ-TV139

The TEA2000 shown in Fig.4 (p.23) has a 10k resistor from pin 16 to ground. This resistor should in fact connect from pins 1,3 and 5 to ground. Pin 16 connects ONLY to IC2 pin 9.

Richard Carden's callsign was incorrectly shown in the article. It should be VK2XRL.

G8HKN spotted that in Fig.2, the 33k resistor from pin 15 should connect to +12v and not to ground as shown. The 470pF capacitor is still correct as shown.

SOFTWARE NOTEBOOK No.10 - CQ-TV 139

John Ashmore, G8GXF has pointed out one or two problems with the listing and has added a modification.

The Spectrum will only allow ten characters in the title, and these include the spaces as well. Therefore 'Black&Sync' will just fit but 'Black & Sync' will not and produces an error report (lines 10 and 9002).

In retrospect, line 70 was a bit superfluous. Rather than write to the top screen the command Print 0; sends the text to the bottom screen. However, the hash sign was unfortunately transposed to a £ sign (printer incompatibility - Ed) which is not recognised by the Spectrum.

The corrections to both programs are as follows:-

For Program-1 "BLACK&SYNC"

Delete line 70 and replace with:-

```
70 PRINT AT 21,0; "PRESS ANY KEY TO RUN": PAUSE 0
```

Add a line 72:

```
72 PRINT AT 21,0; "S.S.T.V. BLACK&SYNC 8 SEC FRAME"
```

For Program-2 "STAIRCASE"

Delete line 70 and replace with:-

```
70 PRINT AT 21,0; "PRESS ANY KEY TO RUN": PAUSE 0
```

Add a line 72:

```
72 PRINT AT 21,0; "S.S.T.V. STAIRCASE 8 SEC FRAME"
```

SYNC SEPARATOR - 'BEST OF CQ-TV' & CQ-TV 119

Chris Heys has been experimenting with this excellent design and felt that others might be interested in his departures from the original.

1) The fairly constant current through the DC-restore diode seemed to limit the voltage excursion at the comparator's inverting input and thus to crush the sync pulses; this led me to connect the associated 100k resistor to ground instead of to -12v.

2) This neccesitates changing the clip-level which is applied to the non-inverting input, by shorting-out one of the 2k2 resistors.

3) The input capacitor can be turned around so that its negative plate connects to the composite video input.

4) Pin numbers 2 and 3 on the comparator have got themselves reversed, pin-3 being in fact the inverting input.

5) Since the LM311 is an open-collector device, a 5k pullup resistor was added to the output.

6) Output 'B' delivers line and half-line pulses, so you will want any PLL that you are driving from 't to be fairly slow in its response.

A 70 OR 24cm PA - CQ-TV134

EA4ID came to visit me this summer and, amongst many other topics, he described a self-oscillation problem he had been experiencing with this PA (page 14). It seems that RFC-3 was resonating with associated components on about 7MHz, so this was changed to a six-hole ferrite bead (type VK200) which has cured the problem completely.

EA4ID reports that, with around two Watts of drive he is getting almost eight Watts into the aerial.

UNIVERSAL SYNC PROCESSOR - CQ-TV 136

In this design a TDA3950 is used for IC 2. It seems that the TDA3950A, as now available, requires a larger pulse than standard TTL at pin 5. This can be produced with an open collector gate, such as 7407. The output of the gate is connected to pin 5 of IC 2, with a 2k2 resistor to the +12 volt line and a 7V5 zener diode to ground.

N4A, Fig.2, pin 13 should be pin 15. Thanks to Keith Bulpitt for these.

SOME USEFUL VIDEO CIRCUITS

By Bob Platts G8OZP,

The LM359 programmable Norton amplifier IC can be used as a very useful video amplifier. Housed in the package are two high gain, high frequency stages, that can be configured to give gains of up to 30 dB at frequencies up to 10MHz, with output impedances of 75-ohms. One use for this IC could be to replace the conventional circuitry in an FM demodulator, using one of the amplifiers between the phase-lock-loop stage, and the other as the output stage.

A suggested circuit is shown in Fig.1, both amplifier stages being identical. The pin numbers in brackets indicate the connections for the second stage. The input impedance is set at 75-ohms by R1. This resistor may be omitted if a high impedance input is required to match the output from the PLL circuit. The high frequency response is dictated by the value of C5. The suggested value of 1pF will cause the response to roll-off at 10MHz, whereas, a value of 2pF will cause the roll-off to occur at 8MHz. The frequency response is also improved by the inclusion of C1, although it is not essential. The stage gain is adjusted by R6 and R7 sets the output impedance to 75-ohms.

Capacitors C3 and C4 should be mounted as close as possible to the IC in order to avoid instability. Due to the simplicity of construction and ease of setting-up of the amplifier, it could be worthwhile experimenting with this device in your FM IF system to see what improvements can be achieved.

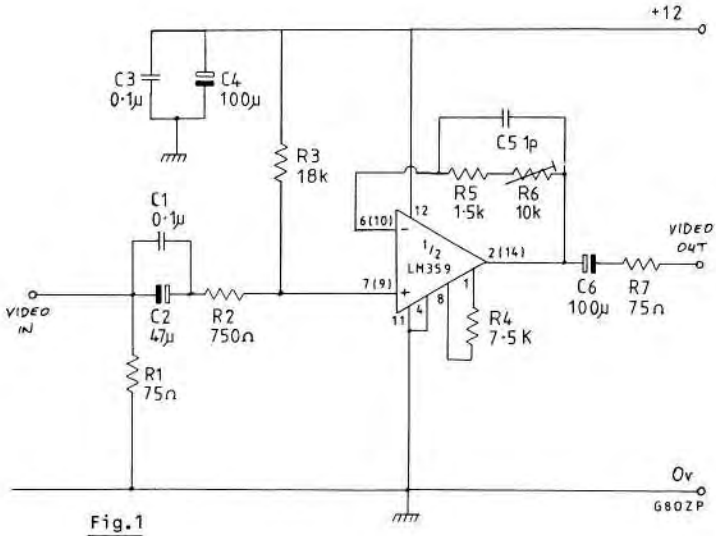


Fig.1

REMOTE CONTROLLING THE NE592

The ubiquitous NE592 (LM733) as used in many FM IF's, including of course the BATC design, can be configured to allow remote or automatic gain control, instead of the usual pre-set gain control. The usefulness of this facility can become evident when receiving widely varying strengths of signals, with differing levels of deviation, requiring constant readjustment of the video gain control to achieve optimum performance. (This is assuming of course that the transmitting station is unable to adjust deviation by the required amount).

Commonly, the gain of the NE592 is set by altering the value of a potentiometer connected between pins 3 and 12 of the device. Because of instability problems this potentiometer must be mounted as close as is practical to the IC, thus making it impossible to mount the control on a front panel for remote adjustment.

The circuit shown in Fig.2 gives the complete circuit of a video amplifier featuring remote gain control. However, the circuitry of the remote control connected between pins 3 and 12 of the IC can be added to an already existing circuit.

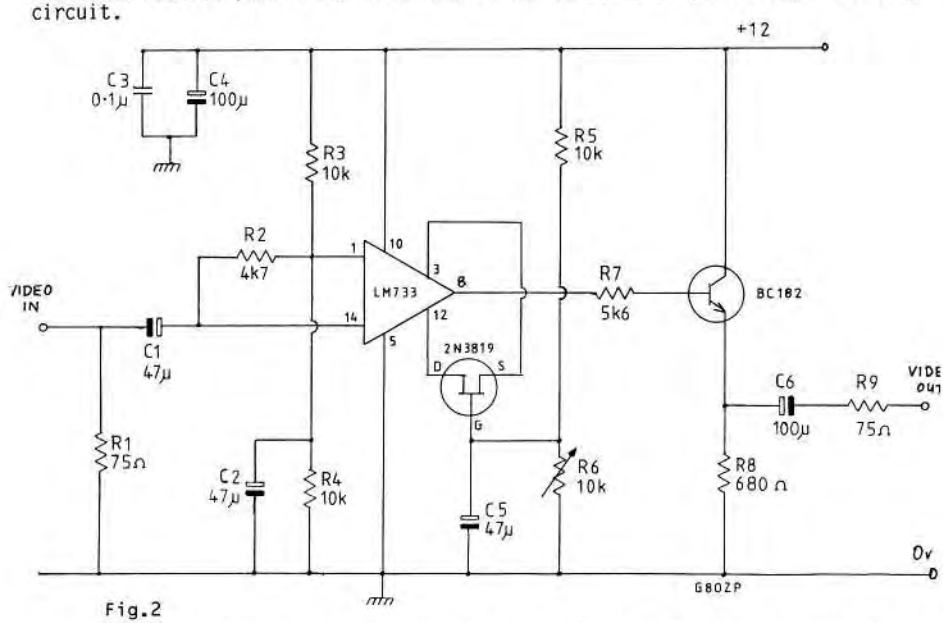


Fig.2

The remote action is achieved by varying the voltage on the Gate of the FET by adjusting the potentiometer R6, which may be mounted away from the circuit on a front panel or wherever. Varying the resistance of R6 varies the amount by which the FET is turned on or off. This in turn varies the Drain/Source resistance of the FET, which is connected across the gain control pins of the IC, thus controlling the gain of the stage. The voltage on the Gate of the FET must be kept lower than the Drain/Source voltage otherwise current will flow into the IC from the transistor causing problems. If this problem should arise select-on-test the value of R5 to compensate. It is advisable to use

screened leads to connect the circuit to the remote control to prohibit any induced voltages corrupting the operation of the circuit.

VIDEO AGC

The circuit in Fig.3 shows how Automatic Gain Control can be added to the previous circuit, or in fact any existing video stage utilising the NE592. The network of D1, D2 and C8 produces a voltage which is directly proportional to the level of the output signal, rising as the output does. This voltage is fed to the base of the BC182 which turns on as the voltage rises. As the BC182 turns on, the collector/emitter resistance decreases, thus reducing the voltage on the gate of the FET and hence the gain of the IC. The response time of the AGC circuit is controlled by C5, lowering its value decreases the cut-in time and vice versa. The threshold level at which the AGC operates is adjusted by potentiometer R11. An AGC range of around 16dB is available, with a maximum amplifier gain of about 24dB.

This simple addition to the amplifier circuit could prove very useful in providing a constant video output for varying input signals. Again, it is well worth experimenting with this circuit in order to get the best out of your TV system.

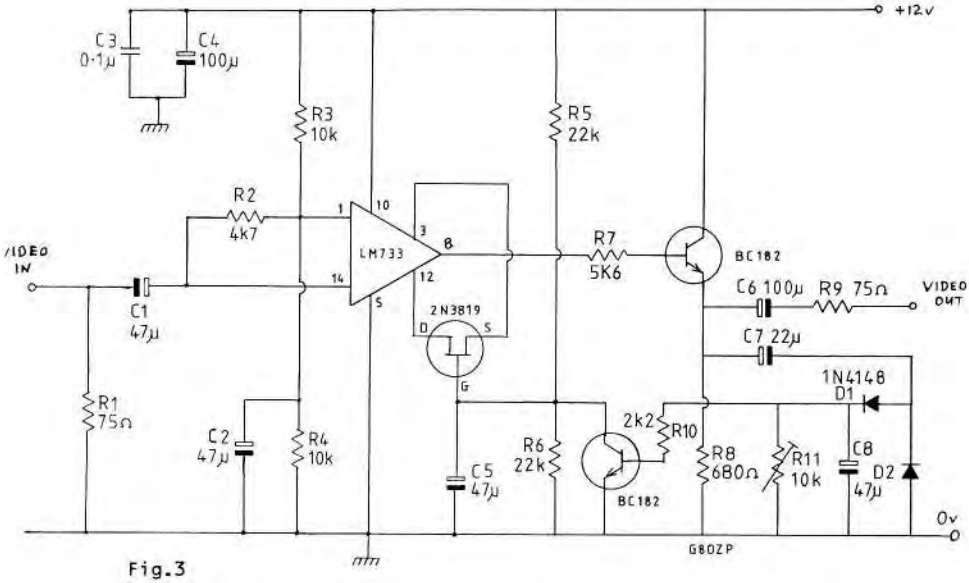
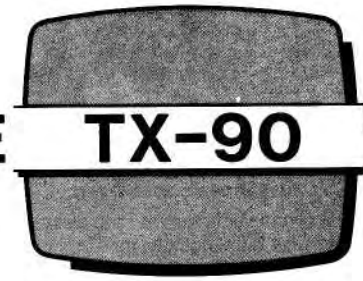


Fig.3

SERVICING THE TX-90



By Eric Edwards GW8LJJ

As many of you may be using the Ferguson TX-90 colour portable television as a monitor, perhaps as described in CQ-TV 131-p7 by Alan Warner G4EZO, it may be useful to know some of the common faults with the chassis and their possible remedies. Also, I have included some modifications that have come to light as these sets have come through my workshop. However, before you all rush out and replace your TX sets, let me say that in my experience they are very reliable.

A fairly common problem is failure of TR112, the line output transistor. It is very worthwhile to check around the transistor for dry joints, as these are the usual cause of failure. It is also worth obtaining a replacement transistor and keeping it in stock, they are Thorn devices and are numbered T9064V. Although a special device they are obtainable from most suppliers at around £1.00 each.

Another common cause of failure of the line output transistor is high voltage transients within the line and EHT stages. To eliminate this problem the efficiency diode (some of you may know this as the boost diode) D113 needs to be changed to an Avalanche type. The recommended replacement is a specially selected version of the BYV95 and is coded OGF721 by Thorn. It is available under their part number OOV4-631.

A modification has been introduced to increase the AFC range of the receiver at the top of the broadcast band. A voltage dependant resistor is fitted in parallel with R102. This VDR is available from Thorn suppliers under the number P152/IR.

Another modification to improve Field hold is to reduce the value of the series resistor R116 between the field hold control and the 12 volt rail to 560k.

In the power supply stage, if a BY127 is fitted as the mains rectifier, then it is recommended to be changed to a BY133GP.

If you experience the set tripping under no signal or low brightness conditions it can be rectified by changing R213 from 47k to 51k.

To shift the picture slightly to the right, useful when the set is being used with a video input, short out R106.

Finally, if you have a dead set it is worth checking around all the large and heavy components, as the problem could be simply dry joints again. In particular, carefully inspect the PCB in the vicinity of the smoothing capacitors and the line output transformer.

- MEMBERS SERVICES - WHAT DOES WHAT?

Part-1

The BATC members services are often asked for information about the items that are listed on the CQ-TV centre page spread. As an aid to members, we present a potted guide to the items currently available:

Vidicon scan coils are available to suit either 2/3" diameter or 1" diameter tubes. They include a connector for the tube target and are suitable for magnetically focussed monochrome vidicons. The 1" coils can be supplied with high impedance (Z) focus coils, suitable for valve circuitry, or with low Z focus coils suitable for transistorized circuitry. The 2/3" coils are only available with low Z coils. For the low Z types, the line coil has blue and red leads, the field coil has green and yellow leads, and the focus coil is either fitted with turret tags or brown and white leads. In the case of the high Z coils, the line coil has red and white leads, the frame coil has white/brown and white/red leads, the focus coil has white and grey leads, and alignment coils are provided with white/orange, white/black, white/blue and white/yellow leads.

Vidicon bases are also available to connect to either 1"or 2/3" tubes. The design currently available is moulded plastic.

C-Mounts are used for mounting the lens on the front of the camera. They are made of aluminium with a 1" diameter hole threaded at 32 turns per inch to accept the lens, and (usually) three mounting holes. These are made specially for BATC and it is possible to have a C-mount made to suit particular applications, such as 4 hole mounting, or to accept more than one lens on a turret.

1" vidicon tubes are available in different heater ratings (95 and 300mA) - 6" long, (EMI types 9677, 9728, and EEV types P849 and P8031). 2/3" tubes have 95mA heaters (EEV type P8037). All tubes are of separate mesh construction, with magnetic focus, and are to 'amateur' specification. The EMI 9777 Ebitron is basically a 1/2" vidicon with an image intensifier in front of the target. This enables it to see in moonlight, and is suitable for televising astronomical phemomena.

4.5" Image Orthicon camera tubes, type 9565, are available as replacements for ex-broadcast cameras. Electrostatic vidicons, and Leddicon tubes can usually be obtained, to special order.

The club's printed circuit boards are mainly to the standard ISEP size of 112mm x 176mm. Some of these, however, have been laid out so they may be trimmed to Eurocard size (100mm x 160mm), if desired. Board sizes are given below only for non-ISEP size cards. Although many are designed to use the ISEP 33-way edge connector, in all cases only 32 pins need be used enabling the use of less expensive 32 way connectors.

The 'Project 100' sync generator appeared in CQ-TVs 100 to 105. This SPG produces line drive, field drive, mixed sync, mixed blanking, burst gate and PAL switch outputs at TTL level (which normally should be buffered to a 75ohm line off-board). The design includes an on board genlock circuit, enabling the SPG to be locked to external sync pulses. The articles describe a subcarrier to line lock circuit with 25Hz offset, which is not on the pcb, although the required connection points are on the edge connector. The circuit uses a 5MHz crystal (also available from BATC), and standard 74 series ICs. (The pattern generator pcb featured with this project is no longer available).

The sync pulse generator from Handbook 2 (revised edition), uses the ZNA134J IC and related circuitry to generate line drive, field drive, mixed sync, mixed blanking, burst gate and PAL switch outputs buffered to a 75ohm line on-board. The board also includes a subcarrier oscillator and full colour lock circuitry. It does not include genlock, but has provision for this to be added. The board needs a 2.5625MHz crystal (available from BATC), and the subcarrier oscillator is based on a 17.734MHz VXO3 oscillator, available from IQD of Crewkerne, Somerset. The pcb can be trimmed to Eurocard. By omitting the colour circuitry (ICs 1,3,4,5,7,8,9, the 2N3906 and varicap diodes and associated components), changing the capacitor at IC 2 pin 8 to 30pF, and linking IC 2 pin 16 to IC 11 pin 4, and shorting the pads where the varicap diodes should be, the board works as per the simpler circuit in Amateur Television Handbook, Vol.2.

The sync processor board appeared in CQ-TV129 and measures 101mm x 160mm. It accepts a RECEIVED video signal and from it generates 'clean' sync and blanking pulses using a ZNA134J and TBA920 and associated circuits, for re-insertion in the video signal. Any colour burst on the input will be lost, but for a signal where the sync is likely to need such processing this is not a problem. Line and field drive signals are also generated. This board requires a 2.5625Mz crystal (obtainable from BATC).

The SPG, greyscale and character generator circuitry from 'Micro and Television Projects' is accomodated on two small PCBs, sold as a set. The small board, (38mm x 81mm) uses a ZNA234 to generate mixed sync, mixed blanking, greyscale, a black screen, crosshatch, vertical lines, horizontal lines and dots. As such it will operate as a stand alone vision test source, powered at 5V. It is designed to interface with the larger PCB (75mm x 127mm) which enables text to be displayed on screen. The board uses TTL series ICs and is designed to accept a 74S262 character generator ROM. As this is now difficult to obtain, a 2716 E-PROM - programed as a substitute for the 74S262 - is available from BATC. No changes are needed to the rest of the circuit, but CQ-TV132 has details of how to connect the new device. The small PCB needs a 2.5MHz crystal. The keyboard add-on board for this character generator also appears in 'Micro and Television Projects'. It is 77mm x 122mm and enables a keyboard to access the character generator, via two 2114 RAM ICs. The board does not itself contain a keyboard. All of these circuits also appeared in 'Ham Radio Today' magazine.

The electronic character generator appears in the 'Amateur Television Handbook'. It is ideal for producing large captions, such as a callsign or contest number group, producing up to 8 characters on each of 2 lines of text. The text is stored in a diode matrix, or, off the board, in RAM. The circuitry uses 74 series logic, and a 2513UC character generator ROM. It is important to use the

UC variant of this IC, which should be one with a single 5V supply requirement (as all current manufacture is). A variation of this circuit appears in the original article, in Handbook Vol.2 and the 'Slow Scan Companion' for SSTV use. The PCB, being laid out for fast scan use, would need adapting for this application. (The original memory board for this project is no longer available, as the RAM ICs have been discontinued).

The set of 3-double-sided printed circuit boards for the colour test card accomodate the circuitry that appeared in 'Amateur Television Handbook', and reprinted in 'Micro and Television Projects'. These generate a composite colour test card, including a true circle, colour bars, multiburst (frequency gratings), grey scale, red and white bars, crosshatch and edge castellations. In addition, a number of full screen waveforms can be selected. The output is a set of red, blue and green signals, ready to feed a colour coder. The circuitry is largely based on 74 series logic, although as the clock oscillator runs at near 40MHz, S or LS variants must be used in many locations. The board needs mixed sync and mixed blanking pulses to drive it. This project is quite complex, and is not suitable for a beginner to tackle. The specially programmed TBP28L22 PROM for generating the test card circle is available from BATC.

VIDEO HANDBOOK
Second edition

By John Goode.

In order to write a book of this scope and quality I should think it highly likely that Mr. Van Wezel is professionally invovled in television engineering. What is certain, however, is that he is an enthusiast, one of those fortunate people who need to draw no distinction between work and hobby. Although this book is not cheap, for anyone interested in the studio side of television, it is invaluable. Where it is different from most other books of this type is that as well as covering the theoretical side of video, there are also practical constructional projects for the hobbyist, complete with PCB layouts!

It should be said that as far as the theoretical side goes, this is a work of reference. It is not intended that an absolute beginner would learn by reading this book how for instance, colour television works. However, for anyone who has learned the basics, all the information and formulae are there. (Note that the RF side is not dealt with, except briefly in connection with broadcast receivers and VCR modulators). Incidentally, the main reason that the book has gone to a Second Edition is because of the rapidity of change in videotape machines, formats and signal processing.

The author's aim, in which he has succeeded pretty well in my opinion, was to place between the covers of one volume all the relevant technical information that a studio technician might need. The scope is pretty mind-boggling, ranging from cameras to video recorders by way of mixing and microphones, tape-recorders and telecine, lenses and loudspeakers, and not forgetting

lighting and production techniques! And if that's not enough, there is basic PAL theory, transmission-line theory, optics and magnetics, etc. And even then he's not finished, as Mr Van Wezel describes the following projects for the amateur constructor - monochrome camera, vision mixer, monochrome monitor,tv tuner,audio mixer, and sync generator.

By now you will have gathered that I am impressed by this book. The writing style is informal and easy to read, and as I believe that it was originally written in Dutch, I suspect that the credit for this should be shared between translator and author. One slight criticism here is that when the translation was made the term "field sync" was not substituted for the Dutch(?) term "picture-sync". On the good side, the author shows that he has plenty of practical experience in sorting out difficult technical problems by occasionally quoting "Finnegan's Laws" - laws which you and I probably know by a less polite name!

The only serious criticism I have of the book is that the logic diagrams use IEC symbols instead of the familiar BSI ones.(See fig 1). If you are not familiar with the IEC symbols, (and I have not seen them used much in the UK), it makes it harder than normal to work out how a given logic circuit operates. In fact, the whole thing is a bit inconsistent, as in fig.3.29, pp.140 & 141, both kinds of symbol appear!

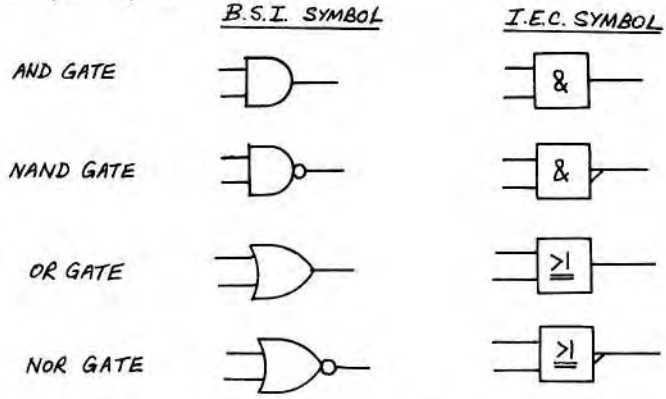


Fig.1

Summarising then, is the book worth the £30 price tag? For me it definitely is, and I would recommend it to anyone who wants to expand the video side of the hobby. If you found the subjects covered by the "In the Studio" and the "In Front of the Lens" series in CQ-TV interesting, you will certainly want to read this book, as the subjects are covered in greater depth. If your interest is primarily in the RF side of the hobby, then it's probably not for you. If you ARE interested in the "studio" side, this book contains virtually all of the information you'll ever need, much of it not too easy to get hold of outside of professional television.

VIDEO HANDBOOK Second Edition
by Ru Van Wezel
455pp, Hardbound.
Heinemann-Newnes, £30

TIME BASE CORRECTION

By Trevor Brown G8CJS,

Time-base correction (TBC) is a very complex subject and is normally beyond the scope of the amateur constructor. However, I will try to explain the subject as simply as possible and outline the way an analogue time-base corrector works and the problem it solves. Digital correctors are even more complex to understand and will not be dealt with here.

A timebase corrector is designed to compensate for errors that are introduced onto a video signal when these signals are stored on magnetic tape.

The reason that time-base correctors are required stems from the fact that VTR and VCR machines use a mechanical scanning system. The mechanics of the video head drum introduces inertia, which in turn causes the drum servo mechanism to constantly vary the speed of the drum in order to maintain correct lock. The best that the drum servo can achieve is to measure where it would like the head to be, ascertain where the head actually is and then either slow down or speed up the drum accordingly. The drum servo position indicator is derived from a tachometer, which is often only counting once per revolution. When the pulse from the tachometer appears the drum servo calculates if it is early or late, performs the necessary speed change and awaits the next pulse. Thus, the best that can be expected from this system is a video signal that 'jitters' in sympathy with the servo changes.

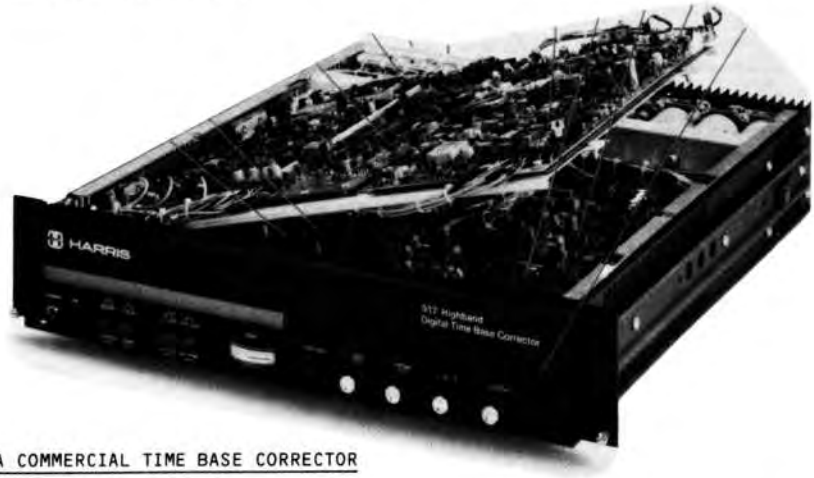
Robinson's first rule of time-base correction is to do as much of the correction as possible by making the servo system as near perfect as you can. Ampex on their AVR 2 machine were so pleased with their new Digital TBC they simplified the machine servo down to switch lock (vertical lock only) and did the bulk of the correction in the TBC, thus circumventing Robinson's first rule.

The way a TBC irons out video jitter is by feeding it through a variable length delay line and then making the delay longer when the video is early, and shorter when it is late. We can further divide this operation down to two stages: The first is deriving the error, the second is using the error to provide correction. To derive the error a stable reference is required, which usually takes the form of a sync pulse generator. If the vertical interval is removed and the remaining line rate pulses used to trigger a trapezoidal waveform generator, then we can use tape sync to generate a sample pulse indicating when to look at the trapezoid. Whenever the sample pulse occurs the trapezoid is examined and the voltage stored until the next sample. This stored voltage becomes the time-base error; when the video is early it will be more positive and lenghthen the delay line, and when it comes later it will be more negative and shorten the delay line. This correction could be as simple as a balanced variable video delay line made from fixed components and varicap diodes.

Time-base correctors of this style were very popular back in the 'quad' days of professional VTR operations. The above system, however, is not suitable for colour operation. A separate stage of colour correction would have to follow the TBC, where the sample is generated from tape burst and the trap derived from the station sub-carrier. The result is fed to a smaller variable delay line to finally correct the coarse correction left by a line-sampled

system. A variable delay line is also a variable equaliser, and in order to stop frequency response variations the variable delays must be followed by tracking equalisers.

A more modern approach to this problem is to present the video signals to a range of fixed video delay lines, then decide which is the correct length of delay and select its output signal. The approach to the error generator would be different in that the reference would need to run in advance of the VTR, and a clock could be started on the leading edge of the reference sync and stopped when the tape sync arrives. If this clock were used to advance a counter, then the number held by the counter could be used to select the correct length video path. The counter could then be cleared and loaded with the next path calculation.



A COMMERCIAL TIME BASE CORRECTOR

This last system may be the approach to stabilising a Betamax type of machine. In the Beta system the colour has already been stabilised, which leaves you with jittery luminance but stable chrominance. The jitter you are out to correct can be measured by locking a monitor to an external SPG and viewing a Betamax replay on it. The resulting jitter will be in the order of 30uS in duration for a first generation recording, and subsequently longer after editing and re-recording etc.

By now you will see the size of the problem. Time-base correctors are not units that can be constructed on the kitchen table. Perhaps the best way to approach them from an amateur point of view may be to get a professional TV station to stabilise and edit your material. If this is out of the question then perhaps gathering your material on film and editing/viewing it on a home-made telecine machine is the answer, thus avoiding mechanical scanning systems and their errors.

ATV WORKING - 10.25GHZ

SOFTWARE NOTEBOOK

No.11

By Roy Humphreys G4WTV

The program below is for the Spectrum computer and produces colour bars on the full width of the television screen. This is unlike others which only use the computers "screen" and leave a blank border around the edge.

It is of indeterminate origin, although I have tided it up with the help of Robin Stephens G8XEU, who has also included a basic routine and data which inserts a callsign in the center of the screen.

```
 1 REM Colour bar program * Press space bar to STOP *
10 LET P$="?????": REM Insert your callsign at ?????
20 IF LEN p$<3 OR LEN p$>6 THEN GO TO 200
30 IF PEEK 33273=201 THEN GO TO 80
40 LET b=0: FOR f=32976 TO 33273: READ a: LET b=b+a
50 POKE f,a: NEXT f
60 IF b=34415 THEN GO TO 80
70 PRINT "ERROR PLEASE CHECK DATA": STOP
80 RANDOMIZE USR 32976: DIM a$(20+(LEN p$-4)*6)
90 PAPER 7: INK 0: FOR F=8 TO 14
100 PRINT BRIGHT 1;AT f,26-(20+(LEN p$-4)*3);a$: NEXT f
110 LET x=128-(LEN p$*20): LET y=60
120 LET xs=5: LET ys=8: LET cs=8
130 GO SUB 140: RANDOMIZE USR 33055: CLS : BORDER 7: STOP
140 POKE 23297,175-y: POKE 23298,xs: POKE 23299,ys
150 FOR f=1 TO LEN p$
160 LET ch=15360+(8*CODE p$(f))
170 POKE 23548,ch-256*INT (ch/256): POKE 23549,INT (ch/256)
180 POKE 23296,x: LET w=USR 33178
190 LET x=x+(xs*cs): NEXT f: RETURN
200 PRINT ;"CALLSIGN TO LONG/SHORT": STOP
210 REM COLOUR BAR DATA ( of indeterminate origin )
220 DATA 33,251,201,34,34,128,62,7,50,141,92,50,72,92,205,175
230 DATA 13,62,10,237,71,237,94,33,0,88,62,7,14,1,205,7
240 DATA 129,61,6,6,197,14,5,205,7,129,61,193,16,246,14,1
250 DATA 205,7,129,0,0,0,201,245,203,39,203,39,203,39,17,32
260 DATA 0,229,6,24,119,25,16,252,13,225,35,32,241,241,201,118
270 DATA 6,27,16,254,6,62,205,116,129,221,35,134,16,248,14,192
280 DATA 62,7,211,254,6,9,16,254,62,0,211,254,6,3,16,254
290 DATA 237,68,13,32,235,35,205,116,129,14,0,237,68,237,68,6
300 DATA 54,205,116,129,221,35,78,16,248,62,7,211,254,62,127
310 DATA 219,254,31,48,2,24,185,62,62,237,71,237,86,62,0,211
320 DATA 254,205,107,13,201,62,7,211,254,211,254,62,6,211,254
330 DATA 62,5,211,254,0,62,4,211,254,62,3,211,254,0,62,2,211
340 DATA 254,62,1,211,254,0,62,0,211,254,201
350 REM CALL SIGN DATA ( by R. Stephens G8XEU )
360 DATA 237,75,0,91,237,67,176,92,237,67,254,91,6,8,197,42,252
370 DATA 91,126,50,129,92,35,34,252,91,237,75,2,91,197,58,129
380 DATA 92,6,8,197,203,23,237,75,1,91,197,48,15,229,213,245
390 DATA 237,75,176,92,197,205,229,34,193,241,209,225,237,75
400 DATA 176,92,12,237,67,176,92,193,16,226,193,16,216,237,75
410 DATA 254,91,5,237,67,176,92,237,67,254,91,193,16,194,193,16
420 DATA 175,201
500 SAVE "COLOUR BAR" LINE 1
```

VTR CLOCK - Amstrad 6128

By David Long G3PTU.

This program for the Amstrad 6128 computer produces a VCR clock on the screen.

```
 10 REM VT clock D J LONG
 20 MODE 2
 30 CLEAR INPUT
 40 GOSUB 700
 50 MODE 1
 60 BORDER 0:PAPER 0:PEN 1

 70 INK 0,0:INK 1,26:INK 2,14
 80 FRAME
 90 GRAPHICS PEN 2
100 q=1
110 DEG
120 FOR t=0 TO 360
130 ORIGIN 250,200
140 PLOT 45*SIN(t),45*COS(t)
150 NEXT t
160 FOR t=120 TO 360
170 PLOT 180*SIN(t),180*COS(t)
180 PLOT 175*SIN(t),175*COS(t)
190 NEXT t
200 FOR t=240 TO 270
210 PLOT 165*SIN(t),165*COS(t)
220 NEXT t
230 FOR t=120 TO 360 STEP 6
240 FOR r=178 TO 170 STEP -1
250 PLOT r*SIN(t),r*COS(t)
260 NEXT r,t
270 FOR t= 120 TO 360 STEP 30
280 FOR r=195 TO 160 STEP -1
290 PLOT r*SIN(t),r*COS(t)
300 NEXT r,t
310 LOCATE 27,19:
PRINT"--------------"
320 LOCATE 26,20: PRINT"40":
LOCATE 16,25: PRINT"30": LOCATE
5,20:PRINT"20": LOCATE 3,12:
PRINT"15": LOCATE 5,6: PRINT"10":
LOCATE10,2: PRINT"5": LOCATE
14,3: PRINT"Fade": LOCATE 2,25:
PRINT"CHR$(164)"G3PTU": LOCATE
27,3: PRINT"--------------"
330 IF (x)=1 THEN LOCATE
28,21:PRINT"625/PAL"
340 LOCATE 28,23:PRINT,"TAKE "(q)
350 GOSUB 630
360 CLEAR INPUT
370 LOCATE 1,1:PRINT "Press any
key(22 spaces)":WHILE INKEY$="":
WEND
380 LOCATE 1,1:PRINT"(24 spaces)"
390 DEG
400 FOR n=120 TO 360 STEP 6
410 MOVE 45*SIN(n),45*COS(n)
420 IF n=162 THEN GOSUB 890
430 IF n=240 THEN GOSUB 560
440 IF n=300 THEN GOSUB 580
450 IF n=306 THEN GOSUB 610
460 IF n=348 THEN INK 1,13:INK2,2
470 IF n=354 THEN INK 1,0:INK2,0
480 IF n=360 THEN GOSUB 910
490 a1=163*SIN(n):a2=163*COS(n)
500 DRAW a1,a2
510 pp=(TIME/300):WHILE
(TIME/300)<pp+1:WEND
520 GRAPHICS PEN 0:MOVE
45*SIN(n),45*COS(n):DRAW a1,a2
530 IF INKEY$="x" OR
INKEY$-"X"THEN 50
540 GRAPHICS PEN 2
550 NEXT n
560 LOCATE 2,14:PRINT"I":LOCATE
2,15:PRINT"D":LOCATE 2,16:
PRINT"E":LOCATE 2,17:PRINT"N":
LOCATE 2,18:PRINT"T"
570 RETURN
580 LOCATE 8,8:PRINT"*"
590 SOUND 1,235,50:
600 RETURN
610 LOCATE 8,8: PRINT" "
620 RETURN
630 LOCATE 28,5:PRINT a$
640 LOCATE 28,6:PRINT;f$
650 LOCATE 28,11:PRINT ;b$
660 LOCATE 28,14:PRINT c$
670 LOCATE 28,17:PRINT;d$
680 LOCATE 30,21:PRINT e$
690 RETURN
700 PRINT CHR$(164)"G3PTU(29
spaces)VTR CLOCK"
710 INPUT"Name of program ",a$
720 IF LEN(a$)>12 THEN PRINT"name
too long" : GOTO 710
730 INPUT"Name   line 2'",f$
740 IF LEN(f$)>12 THEN PRINT"name
too long ":GOTO 710
750 INPUT"date ",b$
760 IF LEN (b$)>12 THEN
PRINT"name too long ":GOTO 750
770 INPUT"System ?? ",c$
780 IF LEN(c$)>12 THEN PRINT"name
too long ":GOTO 770
790 INPUT"Company ?? ",d$
800 IF LEN(d$)>12 THEN PRINT"name
too long "GOTO 790
```

```
810 INPUT"625/PAL?; enter <n> or
<y>",e$
820 IF e$= "y" THEN e$="625/PAL"
830 PRINT"Mistake?<n>,<y>"
840 IF INKEY$="y" THEN GOTO 40
850 IF INKEY$="n" THEN GOTO 870
860 GOTO 840
870 CLEAR INPUT
880 RETURN
890 LOCATE 2,25:PRINT"(10
spaces)"
900 RETURN
910 t=TIME
920 WHILE TIME<t+1500:WEND
930 LOCATE1,1:PRINT"<r>epeat,
<a>bort,<t>ake-1 or <'n'>"
940 INK 1,26:INK 2,14
950 LOCATE 2,14:PRINT " ":LOCATE
2,15:PRINT " ":LOCATE 2,16:PRINT
" ":LOCATE 2,17:PRINT " ":LOCATE
2,18: PRINT " "
960 q=q+1
970 IF INKEY$="a" THEN GOTO 20
980 IF INKEY$="r" THEN GOTO 1120
990 IF INKEY$="t" THEN q=q-1
1000 IF INKEY$="2" THEN q=2
1010 IF INKEY$="3" THEN q=3
1020 IF INKEY$="4" THEN q=4
1030 IF INKEY$="5" THEN q=5
1040 IF INKEY$="6" THEN q=6
1050 IF INKEY$="7" THEN q=7
1060 IF INKEY$="8" THEN q=8
1070 IF INKEY$="9" THEN q=9
1080 IF INKEY$="1" THEN q=1
1090 IF INKEY$="0" THEN q=10
1100 LOCATE 28,23:PRINT
"TAKE "(q)
1110 GOTO 970
1120 LOCATE 1,1:PRINT"(36
spaces)"
1130 t=TIME
1140 WHILE TIME<t+300:WEND
1150 GOTO 320
```

PLEASE NOTE: In lines 370, 380, 700, 890 and 1120 the statement within the quotes in brackets indicates the required number of spaces to be printed.

THE TOWNSVILLE RAT

By John Allsop G3OGX

During a recent visit to Queensland, Australia, I had driven up the coast to arrive in Townsville around midday. My first task was to find suitable accommodation for the couple of days intended stay.

Having booked a room in Motel-16 on the outskirts of the City, I set about exploring the surroundings. It is an interesting City with a high hill near the centre, obviously well frequented by various mobile radio enthusiasts. However, my last trip of the day was to the top of Mount Stuart, which is just a few kilometres outside the City, but quite a drive up a winding and lonely road. This mountain carries the local TV and Radio masts together with a host of other interesting aerial arrays.

Upon reaching the summit, a particularly attractive array immediately caught my attention. This consisted of two circles of stacked radiators. One of them looked right for 70cm., but the other was an 'odd' size, suggesting about 600MHz. Closer inspection of the sight revealed a sign 'VK4RAT-ATV'.

It was well after sunset that I arrived back at the Motel. After settling into my room I examined the TV to see if it was fitted with a UHF tuner - it was, even though only VHF TV is available in the area.

I tuned the band and found nothing, although the tuner gave the impression that it was functioning. The receiver was fed from the Motel's master aerial system but had only one input socket.

Unfortunately, it seems that colour TVs in Townsville 'walk', just as they do in the U.K., so this one was padlocked to its wall bracket, making it impossible to move. With exceeding difficulty I excised the existing aerial plug and inserted the plug from the set's own rod aerial. A very fortunate facility this proved!

A scan of the UHF band now revealed a weak signal around channel 33. After prolonged adjustment of the rods - together with the blades of the ceiling fan, a P3 caption VK4RAT-ATV was achieved. Now it was a matter of waiting to see what materialised as the evening progressed. At that moment the lights went out - and so did the TV, of course!

It was now very dark. I fumbled and found my tiny torch. keeping its duty-cycle as low as obstacles allowed, I made my way out into the yard. The whole area was blacked out and, after a chat with my host and a number of residents, I strolled along the hot, unlit streets following the high voltage lines toward their source as best I could from their silhouettes against the stars. I chanced upon a crew with a floodlight and a long stick reaching up to open breakers on a branch line. After some shouted instructions over a radio telephone, the lights came back on to a chorus of cheers from the residents, their tellies again breathing life.

By the time I returned to my room, the RAT caption had gone and in its place was a very warm looking VK4ZT in person. Two metres is apparently used for talkback but on a frequency outside the U.K. band. Very shortly VK4AFS was making an appearance. Although there was a suggestion of sound on the TV it was quite unuseable, so lip-reading became the order of the evening. Not being very adept at this, I found our bearded brothers the more difficult to follow.

The third station to appear displayed a truly amazing array of equipment. This was VK4FXX whose pictures were clearly in colour. So complex did his shack seem that he appeared to be studying an instruction sheet on how to operate it. Without sound though, I just might be wrong about that!

Eventually, the RAT-cap' made its re-appearance and the evening's proceedings had come to a close. My stay was, alas, too short to get to meet the locals, but if they ever read this I would like to thank them for an evening's entertainment.

If you are planning to visit Townsville and seeking economical, yet comfortable accommodation with very friendly hosts, I can thoroughly recommend Motel-16 - but make sure your 2-metre rig includes 146.7MHz.

CONTEST NEWS

By Mike Wooding G6IQM,

Quite a busy contest news this issue with two sets of results, next year's contest calendar plus the usual chat, so without further ado let's get on with it;

MAY DAY MICROWAVE

This contest proved very enjoyable and the weather wasn't too bad either (makes a change). There was a lot more activity this year, proving that a lot more stations are becoming QRV on the band. I only managed to work the evening session as I was at work that day - see, no favouritism! Conditions were not particularly brilliant but some nice contacts were made. The portable stations were much in evidence I am pleased to say, in fact they outnumber the fixed stations as far as actual entries are concerned. The best reported contact was between Vivien GW1IXE/P located at Blorenee Mountain near Abergavenny and Peter G1COI/P on Walbury Hill in Berkshire, a distance of 120km. You may remember that I unfortunately missed Viv's entry out in last year's contest, well you've got your own back this year Viv as the results show! I doubt if it would have increased the activity any more but I did fail to remind you all in the last issue that there is a prize again this year of a Rigonda portable TV to the winning station on 24cm, donated once again by Rod Timms G8VBC for which many thanks.

I was particularly pleased this year to receive an entry from Gary G4CRJ for the 3cm section. This, coupled with the news in the last issue that Robert G8OZP is also QRV and looking for contest contacts on 3cm is very good news indeed. Well done Gary and don't be discouraged by us old (I use that word advisedly, see elsewhere in the magazine!!) stick-in-the-muds who can't get the energy together to go 3cm portable, if we had the gear that is. So, come on then let's have some more entries for the higher microwave bands. A little bird told me that he knows of one station constructing even higher than 10GHz. Dx contacts across the street what!

SUMMER FUN

The one resounding cry to be heard on '750 during the weekend of this contest was 'where is everyone?' A good question nicely presented - pass! Indeed where were you all? The weather was the usual rain on top of rain, so that can't be the excuse. All the regular contest groups were out and about, but it certainly seemed that activity was somewhat less than normal. However, we all enjoyed the contest even

though conditions were not particularly good. Although my own 24cm gear virtually packed up due to what appears to be a mast-head problem, the band was not up to much, with very few good contacts being made. Sunday afternoon was about the best, weather-wise, with the sun coming out to play again, but there were myself and the rest of the BATC committee stuck in a meeting! (well organised I thought).

So to a few of your comments:
G1COI, Peter, bemoans the lack of activity during the MayDay Microwave. You should have been here last year! (or were you???)

GW1IXE, Viv, said that if her results wern't good enough then perhaps I ought to enter her in the ladies section!

G8LIR/P, Andy and co., "This contest has been a first for us....the first time we have not had equipment failure".

RESULTS.....

MAY DAY MICROWAVE 24cm

Posn	Call	Points	Contacts	Best Dx @	Km
1	GW1IXE/P	958	9	G1COI/P	120
2	G3YQC	649	10	G4DVN	96
3	G1COI/P	638	5	GW1IXE/P	12
4	G1OTO/P	624	11	G3YLG	57
5	G3VXM/P	584	9	G6MPE	65
6	G4CRJ	532	6	G4VTD	57
7	G6IQM	523	8	G4DVN	100

MAY DAY MICROWAVE 3cm

Posn	Call	Points	Contacts	Best Dx @	Km
1	G4CRJ	10	1	G6GIF/P	1

SUMMER FUN 70cm

Posn	Call	Points	Contacts	Best Dx @	Km
1	GW8LIR/P	13053	67	G6WCI	307
2	GW4ZJY/P	6462	35	G4VTD	238
3	G8MNY/P	3845	25	GW8LIR/P	212
4	G6IQM	1198	11	GW8LIR/P	151
5	G1COI	1030	5	GW8LIR/P	188
6	G3KKD	351	2	GW8LIR/P	235
7	G6CEZ/P	197	4	G4CRJ	97
8	GW4KAZ	160	2	GW8LIR/P	75

SUMMER FUN 24cm

Posn	Call	Points	Contacts	Best Dx	@	Km
1	G8MMF/P	476	6	G4VTD		67
2	G6YKC	346	5	G1GST		84
3	G6IQM	278	4	G1GST		52
4	G1COI	106	1	G8MMF/P		53

CONTEST CALENDAR 87

The final contest in this year's calendar, and could we have a little more activity this time please?

SUNDAY NOVEMBER 25th
0001 TO 2359 hrs LOCAL TIME
SLOW SCAN TELEVISION - ALL BANDS

CONTEST CALENDAR 1988

There are some changes to the contests for next year due to the new European policy recently adopted by EATWG. It has been agreed that we will hold four joint contests through the year. One of these will be the 'International', which from now becomes an official IARU contest. This event will be run each year by a different member country - this time by Belgium and the BATC will organise the 1989 contest on behalf of the RSGB. The advantage of running contests at the same time is that, conditions permitting, inter-country contacts are far more likely.

The rules for all these contests will remain the same for now, but the IARU event will be subject to their which will be published in a future issue when they have been finalised. Please note that some of the contest times shown below are quoted in GMT and not local time. This is when the contest is a joint European one, and allows for the fact that some countries do not advance their clocks as we do. So remember, if a contest time is quoted as GMT, you must make the necessary adjustment to local time.

WINTER CUMULATIVE	Thur Jan 7th Fri Jan 15th Sat Jan 23rd Sun Jan 31st	1900 to 2399 GMT each session	All bands and modes
SPRING VISION (JOINT EUROPEAN)	Sat Mar 12th Sun Mar 13th	1800 Sat to 1200 Sun GMT	FSTV All bands
MAY DAY MICROWAVE	Mon May 2nd	0001 to 2359 local	24cm and above
SUMMER FUN (JOINT EUROPEAN)	Sat June 11th Sun June 12th	1800 Sat to 1200 Sun GMT	FSTV All bands

IARU ATV (INTERNATIONAL)	Sat Sept 10th Sun Sept 11th	1800 Sat to 1200 Sun GMT	FSTV All bands
SLOW SCAN TV & AUTUMN VISION COMBINED	Sun Nov 13th	0001 to 2359 local	Slow Scan FSTV All bands
WINTER ATV (EUROPEAN JOINT)	Sat Dec 10th Sun Dec 11th	1800 Sat to 1200 Sun GMT	FSTV All bands

THE 1986 INTERNATIONAL

Just time before closing for press to make reference to the annual International ATV contest held on the 12th and 13th of September. Once again the UK contingent was in good voice and large numbers of stations were reported on the bands. There was a marked increase in 24cm activity this year with one or two stations specialising in that band only.

Unfortunately the first day was plagued by high winds and rain. G8MNY/P lost a mast in the gales and the whole aerial head hinged down from a great hight. The contest was conducted at half mast! Similar sad reports were received from other portables and I think they deserve medals for braving the elements as they do.

Last year's winners GW8LIR/P arranged some prior publicity for their station by sending huge (12" x 8") QSL cards to stations worked in previous contests. The card provided not only QSO details but also much information about the group itself, and its activities. Some nice graphics make it worthy of a place on the shack wall.

I think this publicity paid off though since a rough count made their points total around 21,000 from 73 contacts. They worked all through the night and were rewarded by several contacts into Holland, Belguim and France.

Could we please ask the organisers of the Telford, Lincoln and Biggleswade rallies to move their dates for next year? They played havoc with our head-count!

Full report next time.

BATC AUTUMN VISION SATURDAY OCTOBER 25TH

0001hrs to 2359hrs (local)

ALL BANDS - ALL MODES

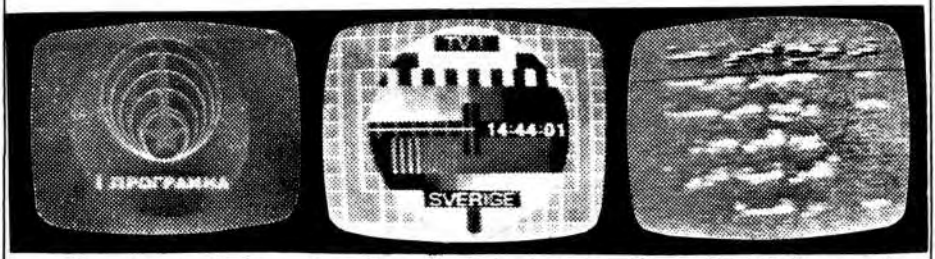
DX·TV CONVERTER

with WIDE and
NARROWBAND
I.F. SWITCHING

***Model* D100**

COVERS BANDS I, III & UHF

Only 180mm x 120mm x 90mm approx.



From May until September, Sporadic-E ionisation affects Band I frequencies between 40 and 70 MHz. Watch its fascinating effects by viewing TV pictures from Europe and even further afield. Countries logged last year included Russia, Poland, Czechoslovakia, Hungary, Yugoslavia, Rumania, Iceland, Norway, Finland, Spain, Italy, Portugal, Switzerland, Austria, Denmark, Sweden, Morocco, Tunisia, Jordan, etc., etc.

Interested? For further details send 52p in stamps (refundable against first purchase) and we'll send you a copy of our DX-TV starter guide which discusses the hobby of long-distance TV in general, the pros and cons of narrow-band DX-ing, propagation and the much acclaimed D-100 DX-TV Converter system. We'll also send details of our latest range of publications.

We can also supply the latest book by Roger Bunney ('A TV DXers Handbook') at £5·90 including P&P (UK only). Also available is 'TeleRadio News' at a subscription rate of only £6·00 (UK only) for 6 bi-monthly issues. Details of export prices for all items available upon request.

HS PUBLICATIONS

7 EPPING CLOSE DERBY DE3 4HR ENGLAND

NEW AERIALS AND POWER AMPLIFIERS FOR 24

By Mike Wooding G6IQM

Possibly a new name to many, Micromax R.F. Systems have recently entered the amateur TV world of 24cm. The equipment available so far comprises a range of quad-loop aerials and some RF linear amplifiers, more products are expected to follow later.

AERIALS

The quad-loops are available in either 27 or 38 element versions. Construction is very robust although the aerials are lightweight. They employ a 15mm square-section aluminium boom with a sub-boom and a mast clamp which allows for horizontal or vertical polarisation. The boom is made from plated T-pieces, thus giving the facility of replacing damaged sections without having to replace the whole boom.

The aerial elements are made from heavy-guage wire loops soldered to saddle bolts. An N-type connector is coupled to the driven element using semi-rigid cable, thus giving a fully waterproof system. A single reflector loop and a final plate reflector completes the radiating system.

Bandwidth is quoted as 1250 to 1320MHz - just covering the major section of the band used by ATV'ers - with a slightly rising gain characteristic favouring the high end of the band.

Vertically stacked or horizontally bayed systems, complete with power splitter/phasing harnesses, are also available.

Under test by G1GST and G1GPE the aerials have proved equal to any other commercially available products and the overall impression is of a very well made high performance aerial.

LINEAR AMPLIFIERS

These power amplifiers are based on the 2C39A forced air cooled valve. The cavity consists of an aluminium cylinder closed with square brass plates. Good quality finger-stock is used to ensure a low resistance contact with the valve electrodes. A unique method of mounting facilitates valve replacement.

Drive input is via a BNC connector and input tuning is by an adjustable plate capacitor. The output from the cavity is via an N-type socket, the position of which is adjustable to optimise power transfer. The cavity is tuned by another plate capacitor, which is easily and safely adjusted for resonance. Safety and electrical insulation is adequate throughout.

The bias network (for setting power output) is mounted on a separate printed board fitted onto the side of the amplifier. Adjustment is by a variable resistor mounted externally (front panel?) Mounting plates for a fan are fitted to the base plate of the unit, although the fan itself is supplied as an optional extra.

Under test by G1GST and G6IQM, power levels of 60 Watts peak-sync for 2.7 Watts drive and 800 Volts HT, and 28 Watts peak-sync with 1.7 Watts drive and 1000 Volts HT were obtained. Good RF and thermal stability was noted with only slight adjustment required to the output tuning after warmup. The models tested were the low power (20W) and the medium power (50W) single valve versions. A two valve version is also available giving a projected 120 Watts for 10 Watts drive.

The amplifiers are extremely well engineered and give consistently good results and can be recommended.

Micromax R.F. Systems, 5 Pinfold Crescent, Penn, Wolverhampton, Staffs WV4 4ET.

AN ARTWORK LIGHT BOX

By Eric Edwards GW8LJJ,

Over the Easter break I decided to produce some artwork for a printed circuit board. Up until now I have used a drawing board with a light shining on the paper, which is fine up to a point and, considering the cost of artwork light boxes commercially available for A4 size at around £60, has sufficed quite well. However, I decided that perhaps constructing such a box might prove worthwhile and indeed it has been. My method costs a fraction of a commercial box, but for our purposes is adequate.

The box itself is a modified 35mm slide storage box. The internal plastic slide holders are removed and the lid taken off its hinges. An aperture is cut in the middle of the lid just a little longer than A4 paper size which is covered by a piece of 4mm glass cut slightly larger the aperture, this should cost around 60 pence.

A small striplight is required to provide the illumination. In my lightbox I used a 30W filament strip lamp and I need to use sunglasses! so I reckon that a maximum of 15W is all that is needed and, on reflection (excuse the pun), I think that a low voltage 13W flourescent would be perfectly suitable.

The next step is to secure the glass to the lid with strips of wood. There are various pre-moulded wooden battens available to suit the purpose. Then the light fitting is installed inside, mounted to give the most evenly distributed light possible. All that remains now is to attach a piece of A4 tracing paper, or better still graph paper to act as a diffuser to the underside of the glass. Fit the original lid back onto the hinges (this is to help keep the whole assembly clean and free from scratches) and that's it; an economy A4 light box for a fraction of the cost of a commercial unit.

MITSUMI TVRO MODULES

TVRO enthusiasts will probably know of the Mitsumi satellite TV receiver modules which are used widely in TVRO applications. The modules also make good receivers for the 24cm amateur TV band and many amateurs are using them for that purpose.

Phil Seaford, G8XTW, is one supplier and has sent the module interconnection details to CQ-TV in order that potential users may get some idea of what is involved. The module set comprises:-

1. Tunable down-converter covering 950 - 1750MHz with a fixed intermediate frequency of 479.5MHz.
2. Fixed down-converter which converts the first IF down to 70MHz
3. Video demodulator producing a composite video output. Note that this signal is raised on a 10-volt DC pedestal.

For amateur applications a pre-amplifier is needed in front of the tuner, not only to amplify the incoming signal but, more importantly, to significantly improve the system noise performance. The tuner is intended to follow a low-noise block down-converter from the 11GHz band in satellite applications and therefore is not really designed for weak-signal inputs direct from an aerial.

Fig.1 shows the connection details as supplied. Around +8v is needed on the tuning pin to cover the 24cm ATV band and this can easily be dropped from the +12v rail. The control can, of course, be panel mounted. For TVRO use provision is made to feed DC volts down the input coax to feed the block down-converter. If this is not required then no supply should be connected to this pin.

A useful prescaler output is provided which provides an output signal representing the local oscillator frequency devided by 256.

Because the video output pin is elevated to +10v the composite signal is AC coupled to the NE592 video amplifier. This amplifier has a video gain control and selectable video polarity outputs. The composite output is intended to feed either directly into an RF modulator or into a TV monitor whose input is unterminated.

(EDITOR'S NOTES) I think it desirable that some decoupling capacitors be provided around the circuitry. I would connect 0.1uF capacitors from each +ve pin of the modules to ground as well as the 'tune' pin. The NE592 should have a 0.1uF from pin-10 to ground and the main +12v rail provided with at least one 100uF capacitor to ground, preferably in the vicinity of the video amplifier.

The gain control preset on the NE592 is a bit vicious - being 'all or nothing' in range. It is nicer to restrict the range somewhat and this may be done by inserting (say) a 220-Ohm from the end of the control to pin-3, this prevents the amplifier from running at maximum but provides gain figures of between about 1.5 and 20. A table of resistor value versus gain may be found on page 54 of CQ-TV 132.

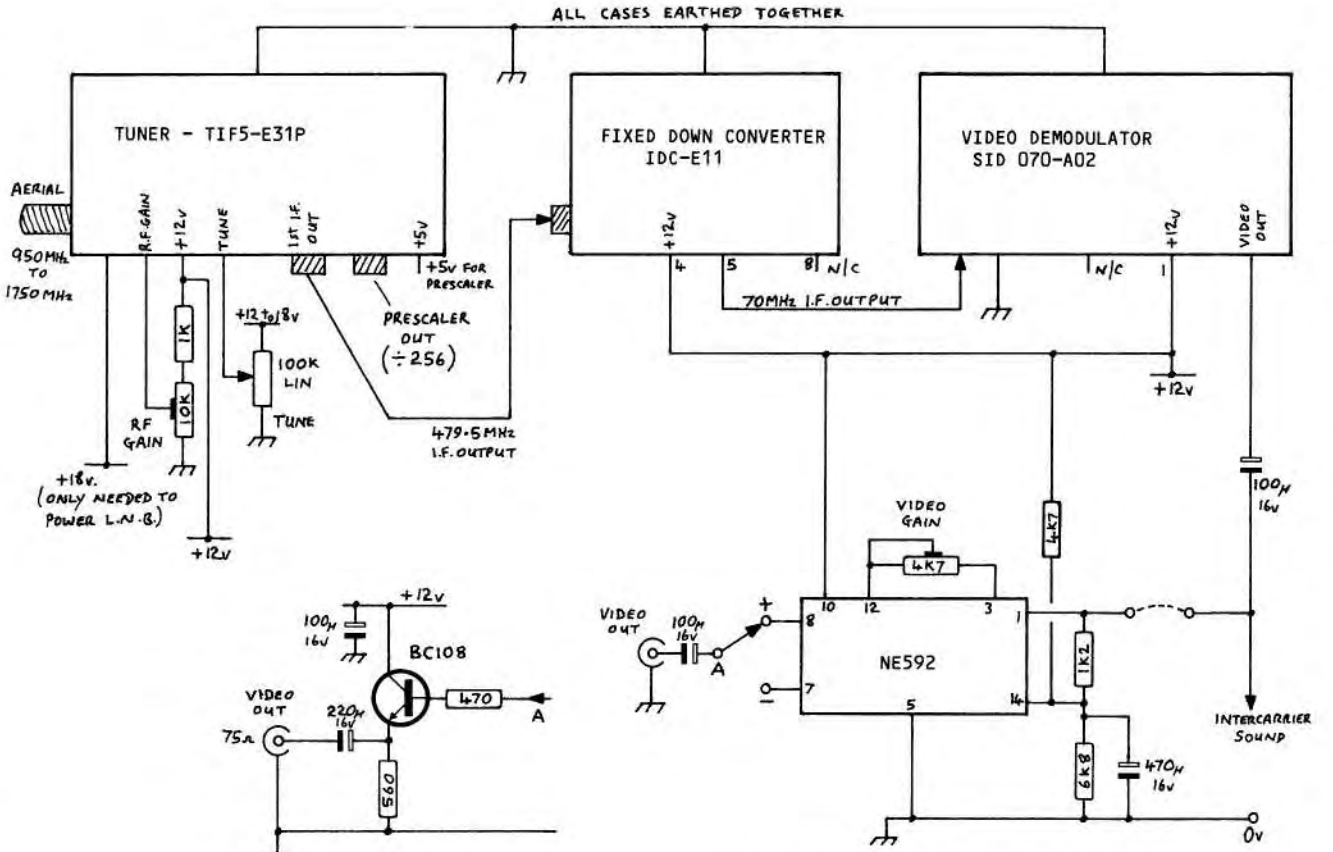


Fig.1 Interconnections for Mitsumi TVRO receiver modules.

Fig.2 Alternative 75-Ohm video output circuit.

As previously stated the video output is almost certainly intended to drive medium or high impedance loads, since the NE592 is not specified to drive directly into 75-Ohms. You may however wish to provide a 75-Ohm output in order to connect to a terminated input, so I have included the circuit in Fig.2 to achieve this. You will notice that it derives its base bias from the NE592 therefore no series capacitor is needed.

No video de-emphasis is shown in the figures and, if this is required, the circuit may be wired directly in series with the 75-Ohm video output. Suitable video de-emphasis circuits have been published in several recent issues of CQ-TV.

* * * * * *

A tunable or fixed sound demodulator will be required to resolve the U.K. 6MHz sound subcarrier transmissions. Several circuits have been published in CQ-TV (issue 136 page 50 or this issue for example).

The Mitsumi units are available ONLY as a three module package and are priced at £64.00 plus £1 postage from: Phil Seaford, 14 Nevis Close, Leighton Buzzard, Beds LU7 7XD. Modules are also available from CQ-TV advertiser Silverstone Electronics Ltd of 78 High Street, Whittlebury, Towcester, Northants NN12 8XJ.

Mr.Seaford also advises the development of a new "high performance" FM-TV receiver using the Mitsumi front end and the latest Plessey demodulator chip. The receiver is to have the following features:-

Full-band coverage for satellite TV - 950 - 1750MHz.
Bandspread facility for amateur TV applications.
A "decent" 'S' meter.
Polarotor drive circuit.
Buffered baseband outputs for decoders.
Fully tunable sound IF with speaker output.
RF output for domestic TVs.
Built and aligned PCB.

A SAE will bring all the details.

POPULAR SLOW-SCAN FREQUENCIES

80 metres: 3.730MHz
40 metres: 7.040MHz
20 metres: 14.230MHz
15 metres: 21.340MHz
10 metres: 28.680MHz
2 metres: 144.50MHz

TWO TAPES REVIEWED
....One video and one audio

VIDEO

HS Publications, well known for their DX-TV magazine 'Teleradio News', have recently brought out a video tape entitled 'Examples of Propagation' under the brand name 'Audiotel-7'. The tape lasts for 33-minutes and is available on standard VHS or Beta formats. It comes complete with a two-page leaflet giving details of the recorded examples of broadcast DX-TV propagation.

The tape has a lively start with nice titles over shots of some broadcast transmitting aerials. The title sequence continues with indoor shots of DX-TV receiving equipment and the whole is accompanied by some lively organ music.

A text page explains the purpose of the tape and warns that apparent sync disturbance on many pictures is caused by the propagation mode being illustrated - and not by your TV or video recorder! In fact all the off-air shots are taken with a video camera so there is no actual disturbance to the viewing equipment.

The program opens with a nice animated drawing illustrating the principle of sporadic-E propagation. This is quite easy to follow for those who are familiar with the mode, but a voice-over giving more details would no doubt help the newcomer. Then follows a text page, explaining more about sporadic-E, which, due to some first-line indents on most of the two-line sentences, made for a rather ragged looking text layout.

There are a great number of shots of all sorts of different foreign TV programmes, some good, some poor, but all illustrating very well the effects of sporadic-E propagation. Many different stations are shown together with their own sound. Particularly interesting is the doppler-shift effect which sounds a bit like tape 'wow' or a machine slowing down. The colour comes and goes on some signals but is again illustrative of the

reception mode. There is one shot of Roumanian TV reception from this country which is quite rare DX. One Russian caption was out of frame lock for most of its duration and it is therefore questionable whether or not it is suitable for inclusion. The constant frame slipping became annoying after a while, especially since the shot went on for some time. The accompanying sound is non-existent and all one could hear was receiver noise.

The section contained, apart from test cards, quite a bit of programme material including news broadcasts, news films, programme titles and station logo's.

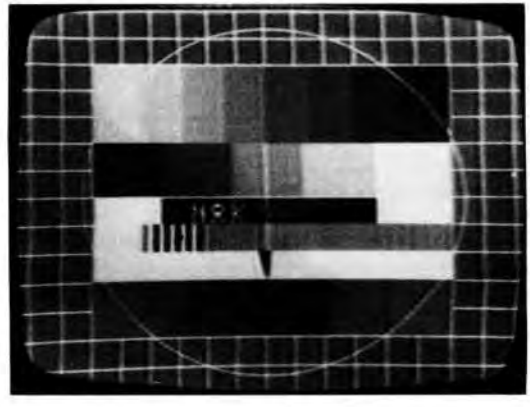
Next comes a 'meteor shower' text screen - again poorly laid out. The examples of reception by this mode are fascinating and illustrates perfectly the receiving technique. The sound however consists of noise which got a bit wearing after a while, surely it would have been better to dub some music over instead.

'F2' propagation follows with the now familiar on-screen description. The sequence shows the effects on pictures quite well although, because of this, many of the shots are not easily recognisable by the in-experienced eye. Again there is only noise on the sound track, apart that is from someone moving around in the room and the occasional whirring of the camera's zoom motor.

Next comes tropospheric propagation. Some excellent quality material here, with often good colour and sound which shows off the intense lift conditions well. Some of the test cards are on screen for far too long as is the "tropospheric propagation" overlay caption which fades in and out with monotonous regularity.

There follows a nice ending with captions overlaid on a foreign cartoon film. Then comes a copyright warning notice - rather strange since almost all the material was 'lifted' from foreign commercial broadcasts!

Overall the tape is nicely thought out and well produced. Quite a number of shots are far too long and the programme got a bit boring at times. Although there is an accompanying paper identifying each shot, it would have livened things up a lot if the information were voice dubbed onto the tape. This would also remove the need to constantly refer to the 'crib sheet' where you invariably lose your place and can't pick up where you are. The captions are well produced and executed although the layout of the information pages could be better.



The price, at £14.50 (inc), seems a bit high, but I suppose since there is nothing else like it on the market it is reasonable, especially for those not familiar with DX-TV and therefore not knowing what to expect. It is my opinion that if 10 minutes were edited from its length, some voice-overs used and background music where there is no useful sound, the tape would be cheered up considerably.

The tape is available from HS Publications, 7 Epping Close, Derby DE3 4HR.

AUDIO

This tape is a collection of British broadcast TV station identifications, many of which are now defunct, as well as some radio and other recordings.

The tape opens with a G9AED experimental channel-9 station announcement, from the Winter Hill transmitter. It is fascinating to hear the transmission which asks for reception reports and promises a QSL card in return. Following that are some really nostalgic ones such as ABC, Rediffusion, ATV, Anglia, Southern, BBC, LWT, Thames, Yorkshire etc. Then comes the old Greenwich time signal followed by announcements of the BBC radio's home service, light program and BBC Wales. Next is John Kelly's introduction to the last transmission (July 23rd 1968) from Rediffusion's London station of the ITA. A whole host of similar items follow including various handovers of stations and franchises etc. Some first transmissions are there such as; TVS, Southern, Westwood and Anglia.

Side B contains the openings of Rediffusion in May 1968, Yorkshire Television and Tyne Tees in June 1980. These are followed by "Tale of a Tower", the audio track from an ITA film describing the action taken following the collapse of the Emley Moor mast in 1969. The principles of radio propagation are briefly described, illustrating the need for a really tall mast or tower for the Emley Moor TV transmissions, and the construction and commissioning of the present tower are described in some detail. Although only the audio track is available it makes for fascinating listening.

The tape is well assembled although one or two points of editing are a bit ragged. This is no doubt due to the vagaries of some of the original material. Quite a lot of this material is many years old therefore the audio quality on the occasional item is a bit below par, nevertheless the overall quality is excellent.

The cassette running time is around 77 minutes and, at £5 all-in, is well worth the money for the nostalgic interest alone.

Andy Emmerson - G8PTH, 71 Falcutt Way, Northampton, NN2 8PH.

A MODIFIED SYNC SEPARATOR FOR TELETRON

By Anthony Fouracre

After building the TELETRON micro controller and VDU from the project originating in 'Micro & Television Projects' by Trevor Brown (BATC), I found that generally the system works very well indeed, at least with the software 'TRON-1' which is all I have so far.

However, I have to say that I found the sync separator somewhat intolerant of varying picture content, so I decided on the simple modification described here. The process enables the original PC board to be used and, indeed, no tracks need be cut at all. This means that the unit can be restored to its original state at any time.

Fig.1 shows the original sync separator circuit, whilst Fig.2 the modified one. A suggested order of modification is detailed below. Reference should be made to Fig's 3 and 4 which illustrate the 'before and after' layouts:-

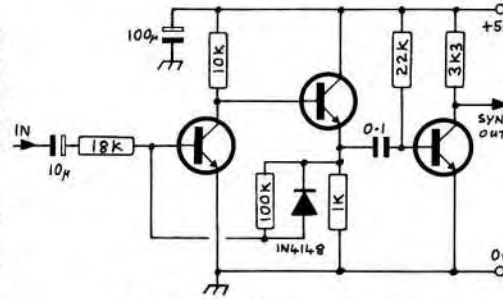


Fig.1 Original sync separator

1. Remove the 18k and replace with a 330-Ohm.
2. Remove the 10k and 100k resistors and the diode.
3. Remove the first transistor and fit a wire link between the original base and collector pads.
4. Fit a 1M resistor into the original emitter hole and the lower original 10k resistor hole.
5. Remove the second transistor and replace it with a PNP device such as a 2N3906. Be sure to fit the new transistor as shown so that its EMITTER goes to +5v and the collector to the 1k and 0.1uF capacitor.

I have carried out this modification to my own unit where it has worked very well. However, it is still likely to be intolerant of a noisy signal.

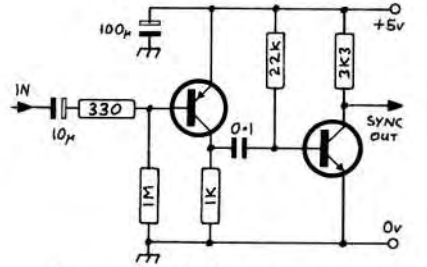


Fig.2 Modified sync separator

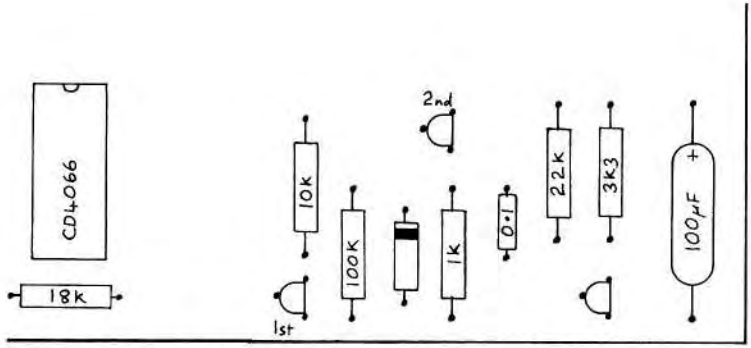


Fig.3 Detail of PC layout before modification

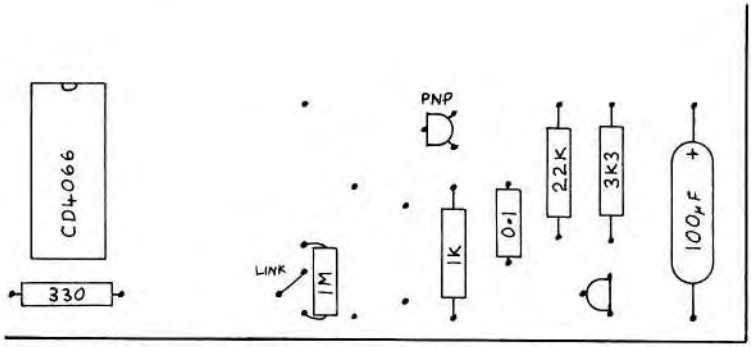
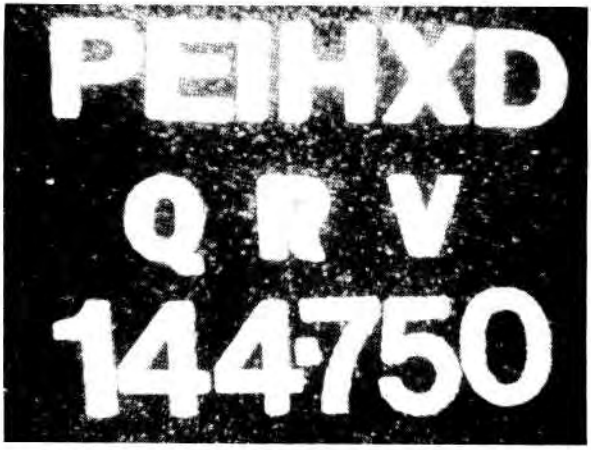


Fig.4 Detail of PC layout after modification



PE1HXD as received during some lift conditions by G6SKO near Derby.

A 'NON-SYNC' DETECTOR

By Anthony Fouracre

This simple circuit can be used with the CQ-TV mix/effects amplifier card or any vision mixer which uses a composite video input.

CIRCUIT DESCRIPTION

The complete circuit diagram is shown in Fig.1. Q1 and Q2 form two simple sync separators. IC1 is a C-MOS exclusive NOR gate which looks at the lack of coincidence between the 'A' and 'B' row sync separators, which causes positive pulses to pass through D1 which are rectified to produce a DC level of +0.6v at pins 1 and 2 of IC2.

Positive feedback is applied through the 2M2 resistor and Q3 sinks the current through to the LED. RV1 sets the sensitivity of the sync signal bias-to-IC2 feedback circuit. In other words TV1 sets the 'H' phase window between the two rows of cross points.

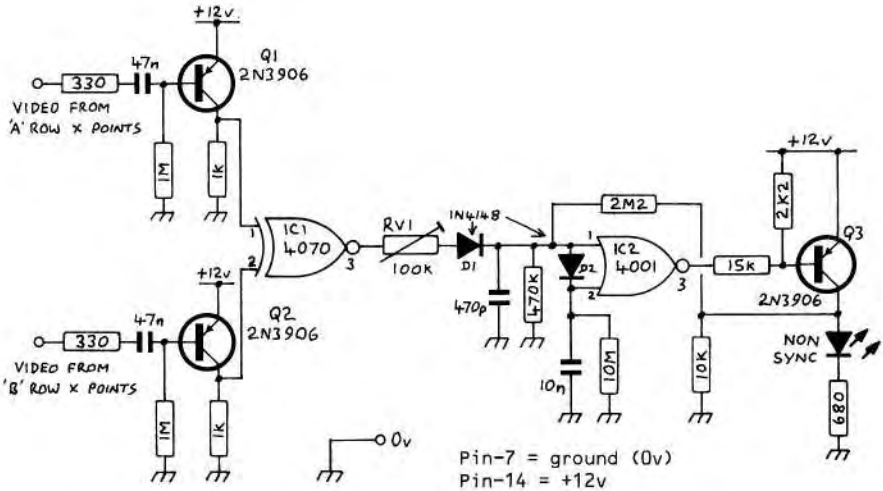


Fig.1 Circuit diagram

SET-UP

Feed two synchronous video signals to the vision mixer. If you dont have locked sources select the same signal on both banks. If the LED is ON adjust RV1 until it goes out. Now select a non-synchronised signal on a 'B' button and the LED should light, if not re-adjust RV1 and start the 'set-up' operation again.

For a more accurate procedure use a reference grey scale or black level signal. Connect the 'scope's number one timebase to 'A' mix effects amplifier and number two to the 'B' row. On the 'B' row you will need a camera with an 'H' phase adjustment or a genlock SPG with 'H' phase adjustment. The sync window should be +/- 500nS from the leading edge of sync.

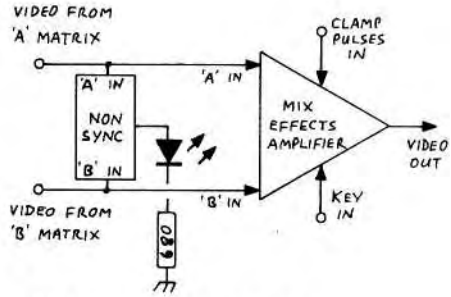


Fig.3 Block diagram

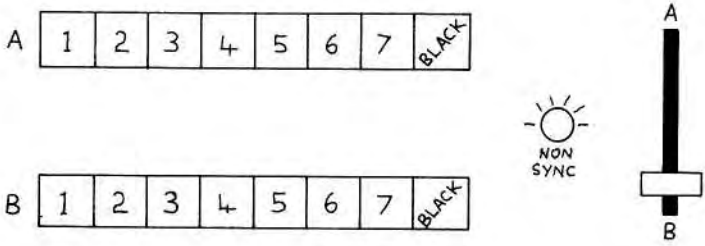


Fig.2 Panel layout

SILENT KEY - G3WW

It is with deep regret that we must record the passing, on May 26th in Eley Hospital, of Richard Thurlow, G3WW, known on the bands as 'Three Whiskey Whiskey'.

Richard, although perhaps a trifle outspoken on occasion, will be remembered as a very kind person who was always ready to help and advise others. he was dedicated to his hobby and recognised the world over as one of the leading figures in slow-scan television. He has set many SSTV operating records and his activities on the LF, HF and VHF bands will be sorely missed.

The BATC extends its deepest sympathies to Richard's widow Helen, and to his family in their tragic loss.

SPECMANSHIP

PART-3 VSWR

By Mike Wooding G6IQM

In part 3, of this exciting series, I am going to discuss SWR - or more particularly - VSWR, and the consequences of having one!

Voltage Standing Wave Ratio is a very important parameter to be considered in radio systems. It is, however, probably one of the most mis-quoted, mistaken and maligned ones in general use by amateurs. Whenever we think that a problem exists within our station we reach for the bridge and start to blame everything on the VSWR. In fact it is quite rarely the cause of any real problems with the type of equipment generally in use by amateurs, but it can be quite significant in the cause of TVI etc.

When pieces of equipment are connected together care must be taken to ensure that their impedances are matched as closely as possible. This is also true of stages within transmitters and receivers or whatever. If the impedances are not correctly matched, then the load will not be able to absorb all the power being delivered to it, and some will be reflected back towards the sending end. Thus, a net loss will occur, which is quite remarkably called the RETURN LOSS, and is usually quoted in decibels.

OK then, so we may have a loss of power due to a mis-match between - say - our transmitter and the aerial system (we could of course have mis-matches throughout the system, but this is less likely with modern equipment and methods of interconnection). Surely we can make up for this loss by 'turning the wick up a bit'? This is not however considered to be a very good idea for many other reasons. The real problem is not so much the effect of the loss of power, but the reflected power travelling back along the feeder toward the sending end, causing an interference wave to be set up as it interacts with the wave travelling out, (Fig.1).

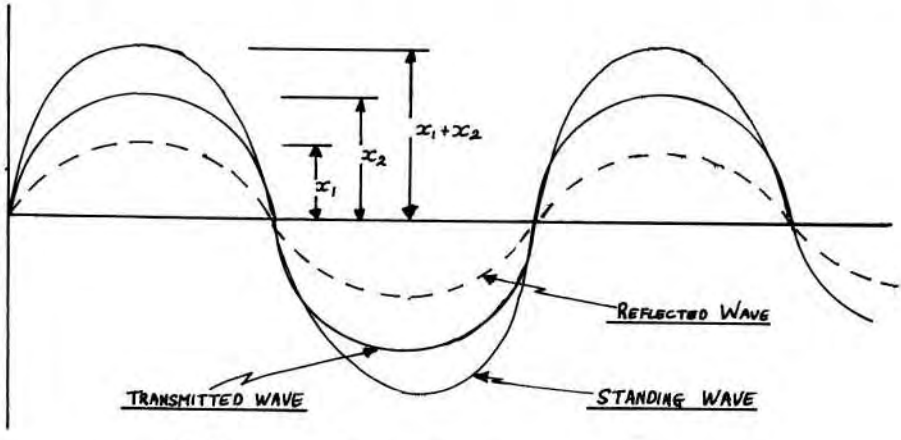


Fig.1 A standing wave

The amplitude of the reflected wave is the sum of the amplitudes of the forward and reflected waves at their points of coincidence. Referring to Fig.1, at the point of maximum voltage the instantaneous value of the transmitted wave is X1 volts, the value of the reflected wave is X2 volts, thus the instantaneous value of the Standing Wave is X1 + X2 volts. This amplitude is dependant upon the amount of mis-match; the bigger the mis-match - the bigger the interference wave. For simplicity, the diagram in Fig.1 assumes that no phase shift has taken place between the transmitted and reflected waves, but in practice this would probably not be the case.

Although the transmitted and reflected waves are travelling along the feeder, albeit in different directions, their relationship in time is the same. If that seems difficult to grasp, just remember that they are in fact the same signal travelling at the same speed. Because of this time relationship the interference wave that is set up is standing still in time, and hence is known as a STANDING WAVE.

Now for an experiment. Get two willing volunteers to stand several feet apart holding a piece of string taught between them. One of them causes the string to oscillate by moving it up and down fairly quickly, thus causing a wave to travel down the piece of string. When the wave reaches the far end it sets off back again. It has not been absorbed (ie. it has seen a mis-match) because the far end has been kept still. However, an observer (that's you) standing side on to the string does not see a moving wave but a stationary one - this is the result of the original and reflected waves adding together. This Standing Wave has been caused by a mis-match between the two ends, one moving and one stationary.

So, we have our standing wave, now what do we do with it? Whenever we talk of sending a signal there is always both voltage and current present. A reflected signal will be similar so there are actually two interference waves produced; a current wave and a voltage wave. The voltage is the one which is generally used for measurement purposes because it is easier to measure. Both, however, give

VSWR	POWER TRANSMITTED (percent)	POWER REFLECTED (percent)
1.ØØ	1ØØ.Ø	Ø.Ø
1.Ø5	99.9	Ø.1
1.1Ø	99.8	Ø.2
1.15	99.5	Ø.5
1.2Ø	99.2	Ø.8
1.25	98.8	1.2
1.3Ø	98.3	1.7
1.35	97.8	2.2
1.4Ø	97.2	2.8
1.45	96.6	3.4
1.5Ø	96.Ø	4.Ø
1.55	95.3	4.7
1.6Ø	94.7	5.3
1.65	93.9	6.1
1.7Ø	93.3	6.7
1.75	92.5	7.5
1.8Ø	91.8	8.2
1.85	91.4	8.6
1.9Ø	9Ø.4	9.6
1.95	89.6	1Ø.4
2.ØØ	88.9	11.1
2.5Ø	81.6	18.4
3.ØØ	75.Ø	25.Ø
3.5Ø	69.1	3Ø.9
4.ØØ	64.Ø	36.Ø
4.5Ø	59.5	4Ø.5
5.ØØ	55.6	44.4

Fig.2 VSWR versus power

the same mathematical results, but by different routes. We'll confine ourselves to the voltage wave.

The Voltage Standing Wave Ratio is the ratio of the maximum voltage on the line to the minimum voltage. Maximum voltage occurs at the points where the transmitted and the reflected waves are in phase with one another, and, conversely, minimum voltage occurs where the waves are in anti-phase. Thus, the ratio is in direct proportion to the amount of mis-match on the line and the loss caused by it. A perfect match will produce a VSWR of one (or if you prefer one-to-one). Note that the VSWR is never less than one. The table in Fig.2 shows the effect of VSWR on transmitted power, with the resultant reflected power.

In our stations, since the output impedance of the transmitter is usually 50-Ohms, then the VSWR is a direct indication of the impedance of the aerial system. For example if your aerial has an impedance of 75-Ohms then the VSWR would be 75/50 or 1.5:1. A 300-Ohm aerial would produce a VSWR of 300/50 or 6:1. Interestingly, there are always TWO impedances which will give the same VSWR. A 37.5-Ohm load in a 50 Ohm system would produce 50/37.5 or 1.5:1 - just as with the 75-Ohm load!

Now let's scotch some frequent mis-understandings;

i) Just because you are using 50-ohm low-loss co-axial cable, it cannot be taken for granted that it is in fact exhibiting that impedance within your system. Cables will only exhibit their quoted impedance when correctly terminated....a bit of a chicken and egg situation you might say.

ii) At UHF frequencies and above, it is quite possible to employ lengths of feeder that are a discrete number of wavelengths long at the operating frequency, thus producing a line transformer which can also effect the characteristic impedance of the system.

iii) Losses at fairly low VSWR's are not that great, if you use a 75-Ohm aerial with a 50-Ohm transmitter the loss is only 4% - yet some would believe that the resulting VSWR of 1.5:1 is a major catastrophy. Even 2:1 only loses you around 10% - it wouldn't even be noticed by a receiving station.

iv) VSWR bridges are usually inserted in the line at the shack end, this often masks the true story! If your coax had a loss of 3dB from transmitter to aerial (quite feasible at UHF) then the power actually arriving at the aerial is only half that seen by the bridge. Similarly, any reflected power will be halved again by the time it arrives back at the bridge. The ratio being measured is very considerably less than that actually at the aerial so you think the system is OK. To be sure you must either calculate out the error, use lower loss feeder or move the measuring point close to the aerial.

Assuming that the feeder is OK, then the VSWR will be directly proportional to the impedance of the aerial itself. It may be worth considering here some of the possible causes of high VSWR generated by aerials: Poor termination of the feeder at the balun, or whatever, is the most usual cause of problems, as is poorly fitted coax plugs and sockets in the system (not just at the aerial itself). Another prominent reason is the ingress of moisture into the termination point and hence the feeder. Damage to the elements of the aerial

will also change its impedance. (It appears to be quite a common misconception that the directing elements of a Yagi aerial only affect the directivity of the aerial. Another point sometimes overlooked is that any aerial has its impedance quoted at a particular frequency, hence it will not neccessarily be 50-ohms, or whatever, over the whole band in use, although in practice, if the aerial is being used within the bandwidth stated by the manufacturer, then any change in impedance across the band will be quite small.

CONCLUSIONS

Maximum power is transferred from a feeder to its load when the load impedance is the same as the source impedance, thus giving a VSWR of 1.

The power reflected by a mis-matched load will travel back towards the sending end producing a Standing Wave by interference with the outgoing wave. This will result in a loss of power being transferred to the load.

Finally, a point that is rarely considered (if even realised) but one that could have serious consequences in a high power set-up. At a point of maximum voltage on the line, due to the coincidence in phase of the transmitted and reflected waves, the Standing Wave could have an RF voltage of twice the transmitted voltage. Care must be taken when handling live feeders, especially open wire feeders as may be used in HF installations. Also, the breakdown voltage of the feeder must be taken into account. For example: a 50-ohm output transmitter sending 400 Watts into an aerial system exhibiting a high VSWR, could cause RF voltages approaching 400V to appear at the nodes of the Standing Wave in the feeder. RF voltages of these orders can be lethal, or at the very least cause very serious burns, so great care must be taken when handling live feeders.

2TV IS ALIVE AND WELL

In August 1926 J.L.Baird obtained a licence, 2TV, to broadcast television signals. This historic call-sign became that of the Motograph House transmitter in London W.1. Although intended for reception at Harrow-on-the-Hill eight miles away, the strange whirring signals were intercepted by many intrigued amateurs.

Now, as a result of much work by the President of the NBTVA Ray Herbert, on behalf of the newly formed Baird Radio Society, the Department of Trade and Industry has agreed that the call-sign G2TV can be issued to its new custodians.

The new radio society will be based at the Museum of the Moving Image which is currently being constructed next to the National Film Theatre on London's "South Bank". Organisation is being handled by Ray G2KU, acting as secretary, and Chairman R.W.(Russell) Burns, whose writings as an authority on television history have made him widely known.

Other officers, as required, are to be chosen at a later date.

Reprinted from 'NBTV' the newsletter of the Narrow Bandwidth Television Association, Vol.13 No.1 with thanks to the Editors.

AN INTERCARRIER SOUND DEMODULATOR

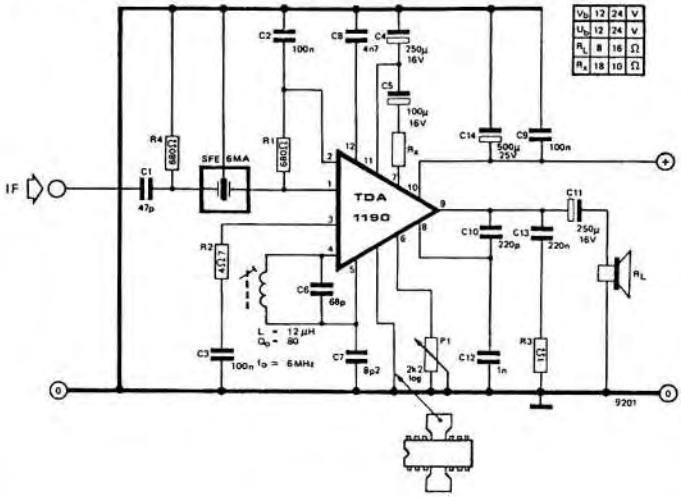
By Dennis Anderson G6YBC

Whilst gathering information on sound systems for use in my 24cm and 10GHz ATV equipment, I came across this little circuit, whose origin is unknown.

The design is based around a TDA1190 chip whose principle contents are:-

1. I.F. limiter/amplifier
2. Active low-pass filter
3. F.M. demodulator
4. Audio volume control
5. Audio pre-amplifier
6. Audio power amplifier.

The circuit can be used for any carrier frequency up to about 10MHz, provided of course appropriate input filtering and quadrature coils are used.



The chip is provided with two cooling fins which, under normal volume operation, may be soldered to the ground plane of a PC board. Alternatively a suitable heatsink may be fabricated. In either case it is essential that these tabs are connected to 0v (ground) since they provide the power return rail to the chip.

The applied DC may lie anywhere between 12 and 24v but should be well regulated.

A simple ceramic filter (used in most domestic TVs these days) is used for input selectivity. The quadrature coil is specified as 12uH with a Q of around 80. A look through the Bonex catalogue will no doubt provide a suitable component. I see no reason though why the 'conventional' Toko coil: MKANSK1731HM should not be used. In this case a 560pF polystyrene capacitor will be required to resonate it to 6MHz. This replaces the existing C6.

There are no critical points of construction. Rx can be 15-Ohms; the loudspeaker should be around 8-Ohms; the volume control (P1) is a linear track component and can be front panel mounted. The 1-Ohm resistor is probably not hyper-critical and could probably be made up from a couple of 2.2 or 3.3-Ohm resistors in parallel. C14 and C9 should be wired close to pin-10.

A DOG'S LIFE

By Eric Edwards GW8LJJ

After doing the usual round of 'exciting' jobs around the house, such as painting the bathroom and stripping paper off the kitchen walls, I ventured out to the shack leaving my wife Pam shouting at me for making a mess, (She won't ask me again!).

My shack is an extension made to the front of an existing building and, because of this, there is a channel running in front of the door leading to a drain. Littered all over the garden is a load of debris, the result of recent renovations to the house. One particular piece of this is a short length of plastic drain pipe, to which our dog (I use the word loosely, as it is a sort of cross between a Labrador and a Donkey!) has become irretrievably attached.

So, there I am in the shack doing some construction work when I realise that I need something from the house. Heyho, heart in hand I head toward the shack door and the impending doom of Pam's wrath. What's this? the door's jammed! A quick look through the shack window reveals the problem, that stupid dog has left its piece of pipe in the channel in front of the door, jamming it closed. The dog is sitting on the patio and no amount of cajoling from me convinces him that fetching his piece of pipe is a good idea. I even asked him in Welsh!

This left me with something of a dilemma. The shack is located a few yards from the rear of the house, the rest of the family were out front, so no chance of anyone hearing my desperate pleas for help. What to do? Hark, the 2 metre rig is singing away in the background so I put out a call for assistance, with the result that within a couple of minutes Martin, my number two son, came and let me out, much to his and the rest of the family's amusement.

The moral of this tale is; never castigate the local 2m men, you never know when you might need them! The dog? Oh yes, he's got a new non door jamming toy.

- TVI -

By Eric Edwards GW8LJJ

I had just completed the construction of my 2C39A linear for 70cm and, after having been 'bitten' several times by the 1kv HT, I decided that the time had come to load it into my 88 element. Great, no problems at all, full power apparently being delivered to the aerial, I decided to put out a few CQ's on the calling channel. Unfortunately my location is not very good although the aerial is about 60ft from the ground, but that is moderated by the fact that I can practically paddle in the Bristol Channel whilst sitting in the shack. Anyway, test card on the air I popped into the house to check the broadcast TV, no problems there so I surmised that I wasn't causing any problems elsewhere. How wrong can anyone be?

The tellingbone rang and, upon answering, a voice was heard to say, 'Are you GW8LJJ?'.

'Yes', I replied ' are you receiving my pictures?".

'AHA!' says this disembodied voice, 'as nice as it may be, I find it somewhat disconcerting to see your test card in the middle of Eastenders!"

'OH!" says I, " I had better switch off"

"Yes!" says the voice.

Armed with as many apologies as I could think of I called on the owner of the voice's house. A local neighbour, he showed me into the lounge where his wife had been watching my pictures with amazement. Apparently they had been viewing alternately, 5 seconds of their program and 5 seconds of mine. As I had previously checked my own broadcast sets for interference and found none, I surmised that the problem was at their end. All very well these suppositions until you come to tell Joe Bloggs that the problem is his set and not your transmitter. 'It was all right before you came along!!!!!', is the usual retort. Therefore, a scientific approach was required (Help!). Why was there interference on my neighbours set but not on mine? Well, it transpired that he uses five receivers in his house (he takes in lodgers!) and consequently employs a six way splitter amplifier, you know the sort of device, 100dB from DC to ultra violet! I could have told him that if he removed his pre-amp all would be well, but his lodgers are bigger than I am!

What I did tell him was that I would make and install a filter to remove my interference (ever the diplomat.....and coward). So, that evening I went into the shack and, with the aid of a sweep generator and oscilloscope, I made a filter to the RSGB Handbook design. Once installed in the input to my neighbours amplifier it only required slight adjustment to optimise it.

Back to the shack and on with the transmitter at full power to continue my tests in readiness for the contest. Several off-air tests with locals proved very successful. Now for the real thing, lets look for some DX. Hang on, a message from the house: a phone call: "Are you GW8LJJ?"

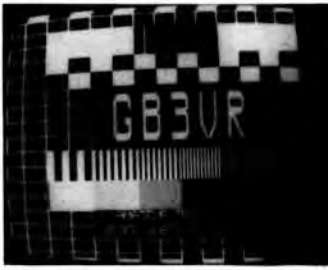
That's it. The aerials are coming down! Goodbye 70cm!!

(Try G8KLH Eric, his address is on page-2 - ED)

THE WORTHING AND DISTRICT VIDEO REPEATER GROUP

BATC TYPE

TEXT



IBA TYPE

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THIS TRANSMITTER GENERATES ITS SIGNAL DIRECTLY AT THE WANTED FREQUENCY, WHICH MAY BE SET ANYWHERE IN THE BAND. ON-BOARD INTERCARRIER SOUND AND FIXED PRE-EMPHASIS ARE STANDARD FEATURES. THE KIT INCLUDES A DIECAST BOX AND COSTS ONLY £65.00.

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THIS UNIT BLOCK CONVERTS THE 1.3GHz BAND TO THE DOMESTIC UHF TV SPECTRUM. USE THIS KIT WITH A STANDARD TV TUNER AND BATC IF PCB, FOR A COMPLETE FM RX SYSTEM. SUGGESTED APPLICATION NOTES INCLUDED. £35.00

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12 element Yagi	£3:00	14.0	6'0"	£12:00	-
17element Yagi	£4:00	15.0	8'0"	£18:00	£14:00
24element Yagi	£4:00	17.0	10'0"	£25:00	£19:00
Double Delta	£4:00	16.0	4'6"	£35:00	-
8 turn helical	£4:00	13.0dBi	5'0"	£35:00	-
12 element crossed Yagi	£4:00	14.0	6'0"	£22:00	-
23/24cm AERIALS					
20 turn Helical	£4:00	17.0dBi	4'0"	£33:00	-
PARADELTA	£5:00	18.0	3'x2'x12"	£40:00	-
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