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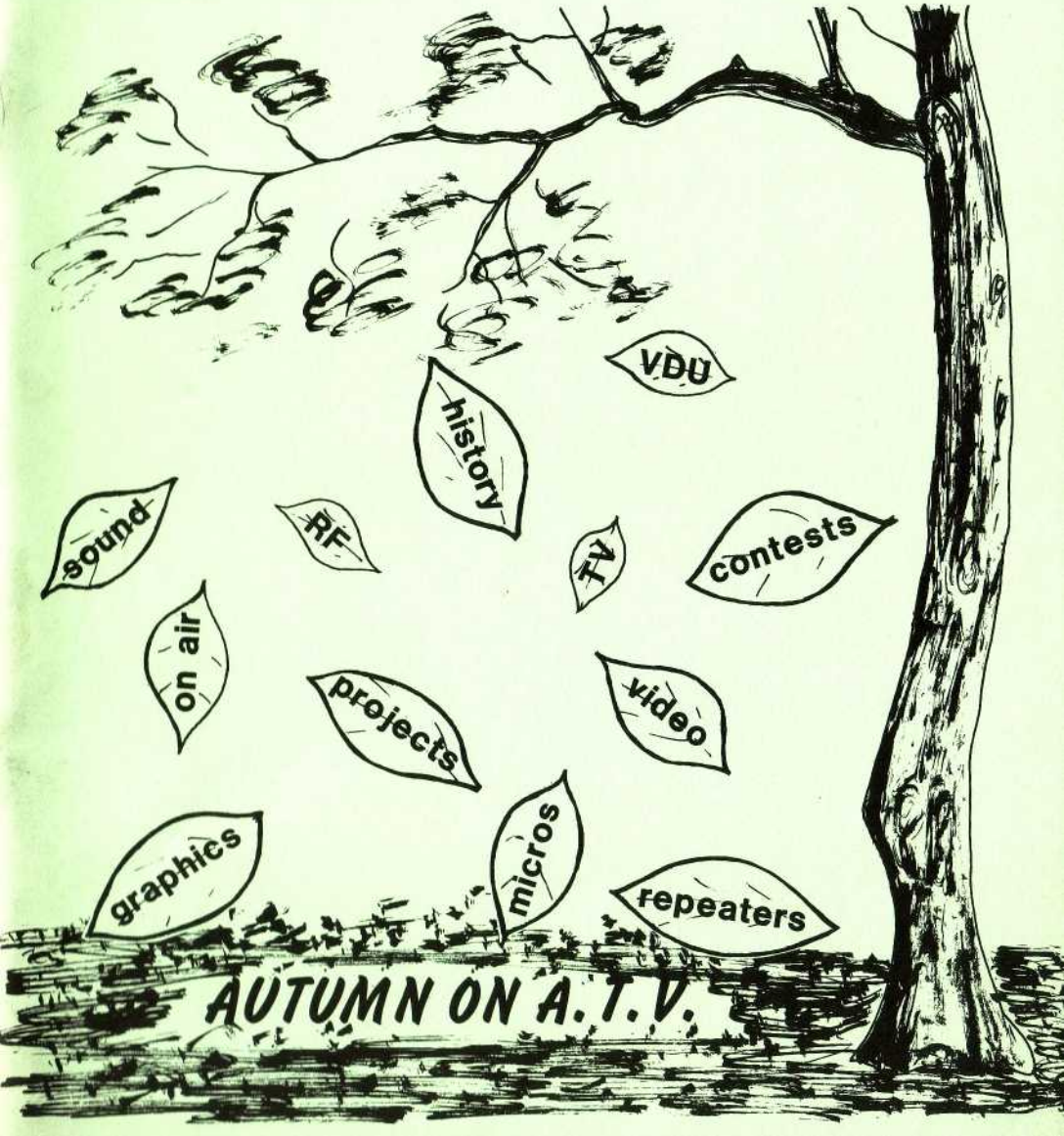
BRITISH AMATEUR TELEVISION CLUB

NOVEMBER 1985



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PLEASE NOTE: If, when writing to a committee member, a reply is required, please enclose a stamped addressed envelope or, in the case of an overseas member, an International Reply Coupon.

MEMBERSHIP

FULL YEAR: £4 or £1 for each remaining quarter of the year. (£5 from Jan. 1986). All subscriptions fall due on the first of January.
OVERSEAS MEMBERS are asked to send cheques bearing the name of the bankers London agent. Postage stamps are not acceptable as payment.

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CLOSE FOR PRESS DATE FOR THE FEBRUARY ISSUE.....20th December 1985

EDITORS POSTBAG

Dear Ed,

Three TV amateurs in this area - G4BBB of Worcester, G1MDD of Upton Bishop (near Ross-on-Wye) and myself, G8CGK of Perterstow (also near Ross-on-Wye) - have all had the experience of their TV receive converters dying for no apparent reason. In my case, I got the impression that it was losing sensitivity and it finally became completely dead. We are wondering if other BATC members have experienced this; and if it is more widespread, what is the cause. In all the three cases mentioned the input transistor was a BFR34A and there were NO protection diodes across the input. Various possible causes spring to mind;
1) an E.M.P.? - We havn't noticed any test nuclear explosions in the U.K. recently!
2) RF excess at the aerial - a) possibly due to radar beams or altimeters? b) RF from the transmitter leaking to the converter - certainly not in my case.
3) Highly charged static rain, or even lightning - no local lightning here, but some thundery rain.
4) What is the likelihood of the new methods of oil exploration from a satellite, which uses a type of radar, affecting our receivers? What wavelengths are used?

In general - what are the "other services" using the 70cm band and what sort of power do they use?

I should be very interested to hear from anyone else who has experienced my problems with their ATV converters.

Grant Dixon G8CGK
'Kyrle's Cross,
Peterstow,
Ross-on-Wye,
Herefordshire HR9 6LD

Dear Ed,

I have just started into SSTV and I wonder if you can help me.
I am using the DRAE and an old Marconi camera, but it is a lot of bother having to make captions on pieces of paper and holding them in front of the lens. I wonder if you could tell me about keyboards for my set up.
I have a 48k Spectrum, could this be used I wonder?
I have had a lot of fun on SSTV with my present equipment which comprises; a Trio TS530S and a 3-element tri-bander as well as a G5RV. So far I have only worked G3WW and G3NOX on 2m.

Philip Hulatt GOBDD.
484 Hern Road,
Ramsey,
St.Marys,
Huntingdon,
Cambs PE17 1TJ

Anyone help? (Ed)

Dear Ed,

We have just begun taking steps towards Sydney's first ATV repeater and happened to stumble across a BATC newsletter from one of our members.
We would be very interested in joining the BATC with the view to obtaining information, videotapes etc. I believe you have a videotape library, and we would be very interested in obtaining some tapes from you, with your permission hopefully, to show them here in Sydney, when the repeater is finally operational.

Unfortunately, Sydney has been very slow where ATV is concerned, being the biggest city in Australia, you wouldn't think so, but perhaps its size has been ATV's downfall. We are in the fortunate position of being 1500ft up in the Blue Mountains, and we can see most of Sydney. This is where the repeater will be sited, and later on we shall be looking at a secondary repeater.

Sue Smith VK2DCR
Secretary/Editor
Sydney ATV Group,
New South Wales.

NEWS ROUNDUP

MAGAZINE SLIP-UPS

It seems that however hard one tries the odd slip-up still occurs in CQ-TV. I've been properly in the doghouse with CQ-TV 131 so I had better make some excuses!

Due to an internal misunderstanding the notice in CQ-TV 131, requesting a further contribution covering the increase in subscriptions for 1986 from members who have already paid for that period, should not have been inserted. The committee had already decided to waive such extra charges. Any additional funds received have been returned to the sender with a covering letter.

Then there was the Solent Scientific ad., (or rather the lack of it). There was I waiting for some new copy and there was Alan Latham expecting me to re-run the previous one. Another misunderstanding i'm afraid.

And as for my poor old show reporter John Hirons well.... I (quite truthfully) said at the beginning of my BATC show report that no copy had been received from John - it still hasn't. I left a message with John's wife a few days before closing date to that effect and guess what? John had sent off the report weeks earlier and the message was never passed on. The worst part about that is that not only was the show report lost but also some computer discs and a rather expensive ROM. Darn the Post Office!

ADDRESSES - MEMBERSHIP AND TREASURER

Please note that the familiar address at 13 Church Street, Gainsborough - for many years the address for membership information - is no longer valid. All matters relating to BATC membership and records are now at the club's computer centre at; 'Grenehurst', Pinewood Road, High Wycombe, HP12 4DD. Any communication for Brian Summers (Hon. Treasurer) may now be sent to: c/o 7 Southlands Drive, Morton, Gainsborough, Lincs.

OVERSEAS SUB'S & MAILING

Would overseas members please note that any payments made to the BATC should be either by a cheque bearing the name of a UK banking agent, or by International Money Order. Please DO NOT send foreign cheques.

All overseas mail is sent surface unless requested otherwise. If you require your magazine by airmail, please add the appropriate amount to your subscription from the table below and state clearly on the renewal form that air mail is required.

Europe	£1.75 per year
Zone A	£2.50 per year
Zone B	£3.25 per year
Zone C	£3.75 per year

Principle countries and their zones are as follows:-

Australia	C
Bahrain	A
Barbados	B
Canada	B
Egypt	A
HongKong	B
India	B
Israel	A
Japan	C
Kenya	B
Kuwait	A
Malasia	B
New Zealand	C
Nigeria	B
Oman	A
Pakistan	B
Saudi Arabia	A
Singapore	B
South Africa	B
South America	B
United Arab Emirates	A
U.S.A.	B
Zambia	B

MERRY CHRISTMAS

The committee of the BATC would like to extend best wishes for the festive season and the new year to all its members. May you all renew your membership and sail with us through 1986, it certainly promises to be a super year for ATV.

WANTED - COMPUTER BUFFS

In response to my request for ATV related computer programs for publication in CQ-TV magazine, I am getting a number of programs for machines to which I have no access. The problems here are: 1) I am unable to verify that the programs work and are suitable for publication and, b) I am unable to produce an accurate printout, straight from the working listing, and in a form suitable for direct reproduction in CQ-TV.

I would be very glad to hear from members with computers other than BBC, who are reasonably knowledgeable about computing matters and who are able to produce good quality listings using, for example, double-strike printing.

Members who would like to help are asked please to write to me (Editor) at: 47 Crick Road, Hillmorton, Rugby CV21 4DU stating what machine you have, available mass storage media and, if possible, a short sample from your printer. Of particular interest are those machines which incorporate various graphics symbols in their listings. Please also indicate whether you could help possibly with original program writing, conversion from other programs, modification and answering technical queries on computing for your particular machine.

D15/1296 IS BACK

I understand that the fifteen-over-fifteen 23cm aerial by Jaybeam is back in production. Although rather expensive this little aerial is surprisingly good over a limited bandwidth. Provided you are working between about 1280 and 1320MHz this aerial is worth considering for local and semi-local contacts. If however you are working repeaters - with their wide frequency splits - the 15/15 is not suitable. In this case you should go for the loop Yagi, reviewed in CQ-TV131, or the 20-turn helix from Sandpiper Communications.

MONOLITHIC MICROWAVE AMPLIFIERS

MMIC's are "out of the lab and on to the shelf" so runs an advertisement from Wave Devices Ltd.

These cascadable microwave amplifiers, by Avantek, seek to replace the traditional hybrid modules which have been in use for some years. The series extends from 250MHz through to 3GHz with gains ranging from 8.5dB (per device at 2GHz) to 19dB at 250MHz. Of particular interest to amateurs is the MSA01 series which has a flat bandwidth to around 800MHz with gains typically around 19dB, and the MSA02 series which are flat to around 1.5GHz with gains of typically 12dB. Noise figures are generally around 5 or 6dB.

In appearance the amplifiers resemble small capstan transistors and they can be mounted onto a suitable printed circuit board. The only external components needed are chip-caps for input/output coupling and bypassing and an RF choke with a series resistor to convey the DC voltage and provide thermal stability.

The ability of the devices to be cascaded makes them particularly useful in amateur circles. Prices are not known as yet but information may be obtained from Wave Devices Ltd., 9 Betterton Street, Covent Garden, London WC2H 9BS

SUBSCRIPTIONS ARE DUE

Please note: ALL subscriptions to the BATC are due on the first of January 1986. Subscriptions are currently £5 and should be sent to: BATC SUBSCRIPTIONS, 'Grenehurst', Pinewood Road, High Wycombe, HP12 4DD. A subscription renewal form is included with this magazine (unless you have paid in advance). Please check your address details and note on the form any alterations.

MEMBERS SERVICES NOTES

One or two items have arrived a little too late to include on the Members Services order form.

A note on the form regarding problems with some TBP28L22 programed PROMS asks for any faulty ones, which have not yet been traced, to be returned for replacement. The batch code on the faulty device is J345A. If you have such a chip please return it for replacement straight away.

A new PC board is available. From 'Micro & TV Projects' a 4-way vision switch board is now in stock; price £3 plus 20p postage.

A source of electrostatic vidicons, such as 20PE20, have been located. They are industrial grade (not amateur) and will cost around £35 each to members - including VAT, P&P etc.

COMPUTER GRAPHICS MIXING SYSTEM

By David Wilson

The vision mixing system that I took to this year's BATC Rally at Crick caused quite a few enquiries. A lot of these were concerned with the system I use to superimpose computer generated graphics over any of my camera outputs.

Before anyone can think about using a vision mixer, they should first make sure that all their sources are gen-lockable and can be made colour synchronous. A video cassette recorder is unsuitable unless you can afford a timebase corrector or can lock all your sources to it.

Although not essential, my system was made genlockable to an external vision source using a subcarrier locking system similar to that described by John Goode in his Universal Sync Unit in CQ-TV 131, or the Colour Genlock Board from CQ-TV 129, and a sync serarator to lock up the Project 100 SPG. A feed of colour subcarrier is brought out of the Colour Pattern Generator board on a spare pin. The outputs from the P100 SPG and colour pattern generator are fed to distribution amplifiers and a subcarrier phaser (CQ-TV 122) to feed the rest of the system and to lock up the cameras, see diagram 1.

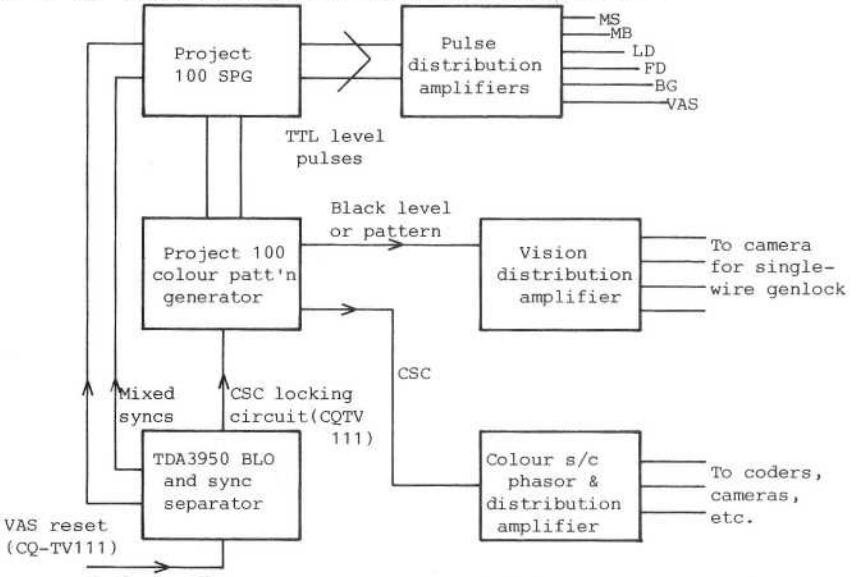


DIAGRAM 1

The BBC micro is made line and field synchronous by fitting one of the many available genlock boards and locking to mixed syncs. The RGB output is fed through a "Chameleon" unit which has been modified to provide an extra output for the coder together with a key signal. The extra output was provided by adding another emitter follower to each of the RGB outputs, and the caption

key was formed by putting the input RGB (TTL level) into a 74LS32 OR gate and an emitter follower. This ensures that dark colours (or even black) can be reliably keyed, see diagram 2.

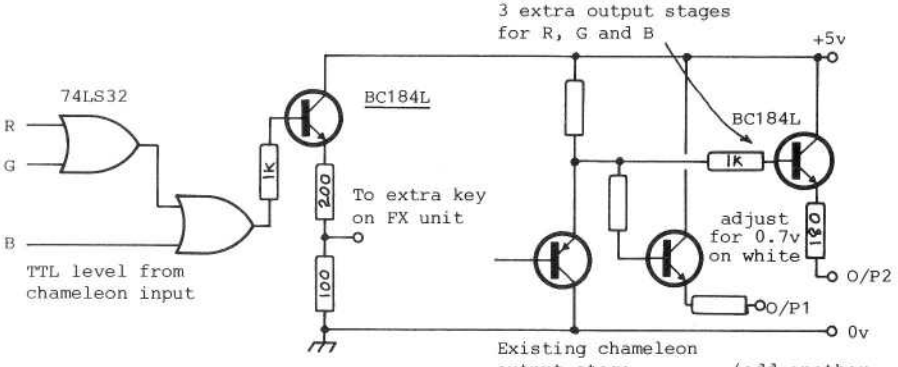


DIAGRAM 2

The "chameleon" device allows you to select any of 4096 colours for each of the logical colours from the micro. These are selectable under software control and I have seen an impressive demonstration where the colours appear to mix from one to another.

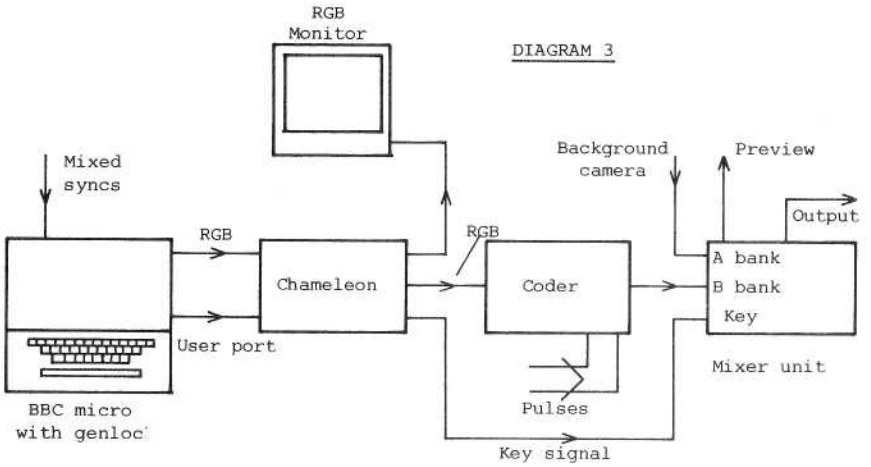
The modified RGB is fed to a coder (BATC 'Handbook-1') and the output from this is the source to one of the banks on a vision mixer. The key signal is used by the mixer to superimpose the computer caption/graphics over the source selected on the other bank. I had the use of a commercially made mixer but the same effect could be obtained if the inputs are applied to some of the effects units described in CQ-TV, or the one in 'Handbook-2', see diagram 3.

The software used for the large lettering came from a few commercially written programs. Beebugsoft's Hershey Characters provided the majority of pages on display. I must admit that there were some faults on the first program I bought which I then sent back to the shop and re-ordered a replacement from Beebugsoft. This had the same three faults! I wonder if they are all the same?

Another source of large characters is Beebtext, available from Proxima. This allows a wide range of character sizes, thickness, drop shadow, Italic etc., and should be very useful for main titles as well as subtitles.

The other program that I had available was Fontmaster by Integrated Video Systems of Watford. This is also called Masterfont and is available from G2 Systems, but this is VERY expensive as it is aimed at semi-professional users as an alternative to a specialised titler such as Chyron or Aston. The software provides a choice of fonts of up to 32 x 32 pixels in Mode-0 which gives very smooth curves.

I hope that the few notes I have given may be of help to anyone who is thinking of building a vision mixing system etc., and I must point out that I have no connections with any of the software or equipment firms mentioned.



LIST OF SUPPLIERS

Prices or specifications may have changed since this list was compiled and details are only shown for guidance. Always write or telephone to check current prices before ordering.

Timebase corrector for VCR
(Analogue. + or - 0.9H correction, 3MHz bandwidth. £1495 + VAT
Modification to VCR to work with above timebase corrector £45 + VAT
Vision mixer console, 2 i/p plus audio £1395 + VAT
BBC micro genlock board £185 + VAT
Unitron Products, Sunningvale Avenue, Biggin Hill, Kent TN16 3AX
Tel: (09594) 71313, 71314, 71315

Domestic camera genlock unit £225 + VAT
Modification to camera for genlock unit £80 + VAT
Simple 2-channel vision mixer £165.50 + VAT
2-Channel mixer with audio + extra FX £325 + VAT
BBC Micro genlock unit £125 + VAT
Elmwood Electronics UK, Riverside, Stanstead Abbotts, Ware, Herts SG12 8HG
Tel: (0920) 871514

Chameleon colour palette £77.40 + VAT
National Micro Centre, 36-38 St. Petersgate, Stockport, SK1 1LH
Tel: 061 429 8080

ELECTROCRAFT vision mixer and BBC micro genlock board.....
See advert on back cover of CQ-TV magazines.

SOFTWARE FOR BBC MICRO

Bigprint Cassette £5.95 inc VAT
Disc £8.95 inc VAT
Beebtext Disc £15.00 inc VAT
Proxima Personal Computer Software, Newlands, 30 Spareleaze Hill, Loughton, Essex IG10 1BT
Tel: 01 502 0230

Hershey font characters — Disc — £15.00 inc VAT
A cassette is available at £10.00 inc VAT
but this does not include the Multifont -
add 50p postage.
Beebugsoft, PO Box 109, High Wycombe, Bucks HP10 8HQ
Tel: (0727) 60263

Masterfont, 40 or 80 track disc + 8k ROM — £295 + VAT
This product is being changed to be all on
disc but with an autocopying device required
to be fitted to a ROM socket.

Also available:-
Mastercaption — £295 + VAT
G2 Systems Ltd., 5 Mead Lane, Farnham, Surrey GU9 7DY
Tel: (0252) 712525

This is by no means a complete list of vision mixers, micro genlock units or caption generator software, but it will give you an idea of what sort of device is available.

AN FM-TV GENERATOR

By John Wood G3YQC

Deciding on a design for a 24cm ATV FM transmitter can be a little perplexing for some, especially since there are several ways of obtaining the same end-result. Perhaps the two most popular methods so far are by generating a 430MHz oscillator, modulating it and then tripling up to the required frequency, or by generating directly at signal frequency, modulating and amplifying to the required level. Both methods have their merits and drawbacks so here is an alternative approach which could be said to be "nicer" and which is not dissimilar to methods used commercially.

For many of us, building and aligning RF power circuitry at 1.3GHz is not an easy task, and one is certainly tempted to buy commercial where possible. However, some of us may have a redundant 23cm narrow-band transverter or mixer-type transmitter in the cupboard, or may be able to aquire one second-hand at a reasonable price, so why not make use of them. Most transverters seem to have an IF at 144MHz as they are designed of course for use with 2-metre equipment, if this frequency were changed to say 70MHz (the industry standard), then a very nice FM-TV transmitter could be constructed with a minimum amount of effort.

Why not leave the IF at 144MHz? Well of course you can, that is if you want your 2m rig to be blocked out by vision every time you go on 24! Any reasonable IF frequency can be used however, perhaps to suit a crystal which happens to be in stock. The local oscillator frequency will need altering of course so that when mixed with the new IF the resulting signal will be on the frequency of your choice.

This article deals with the construction of a suitable IF generator for 70MHz and it must me left to the individual to ascertain whether or not a transmitter is suitable.

A 70MHz GENERATOR

This generator is designed to produce up to around 20mW of drive, although 5 to 10mW is usually sufficient to drive most transmit mixers, that is of course after any input attenuators which may be fitted have been disconnected.

Fig.1 shows the circuit of the complete generator. Video at the standard 1v p-p level is applied to the input which is provided with a gain control used to set deviation. The signal passes through a standard CCIR pre-emphasis network, this may be omitted if required although it will increase versatility if an arrangement were made to switch between the pre-emphasis network or a 'tee' or 'Pi' resistive attenuator, whose attenuation is equal to that of the emphasis network, in this way deviation will not be altered when emphasis is switched in and out.

The signal passes to a pair of transistors wired as a wide-band inverting amplifier. The swept frequency response of this amplifier shows it to have a virtually flat response between 20Hz and 7.5MHz. The circuit as shown is set

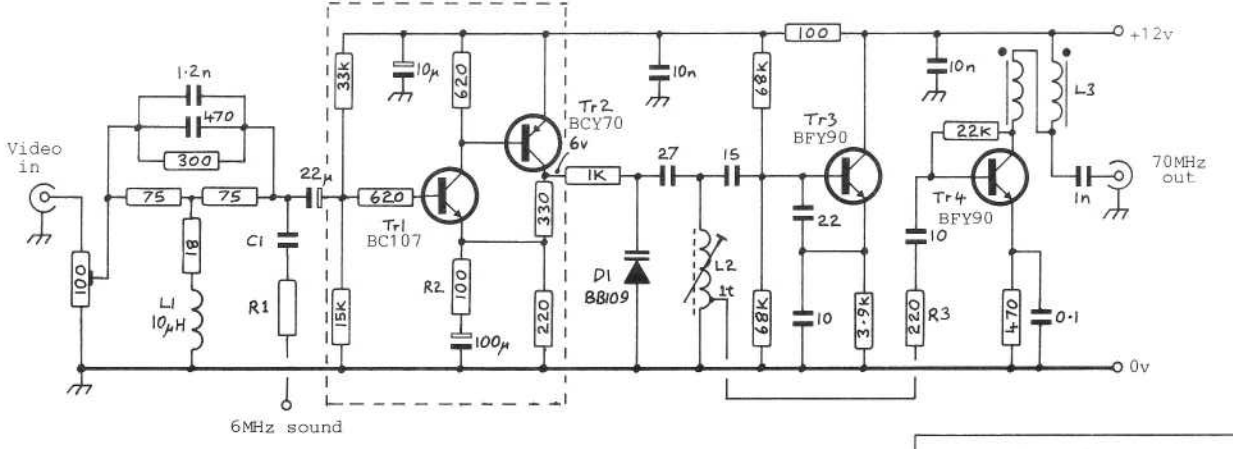


Fig.1 70MHz FM-TV GENERATOR

L1.	Fixed inductor
L2.	Toko S18 coil (white) Cirkit No. 35-10803 with can.
L3.	See text
D1.	BB109 (green tip)

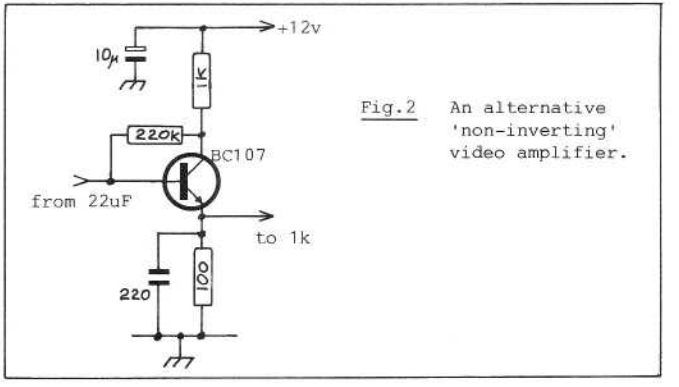


Fig.2 An alternative 'non-inverting' video amplifier.

for a gain of 5.5 however if less than that is required then the 100-ohm emitter resistor (R2) may be changed as follows:-

R2 = 220-ohms voltage gain = 4
R2 = 150-ohms voltage gain = 4.5
R2 = 100-ohms voltage gain = 5.5

A DC level of around +6v is present on Tr2 output (without modulation), this is to ensure that modulation takes place on a linear part of the diodes' characteristic curve, so providing good linearity. The 70MHz voltage controlled oscillator is based around a standard Colpitts circuit and has been optimised not only for stability but also for a reasonably flat amplitude response over the required frequency range. The circuit in use by myself uses the largest VHF Toko coil available and, provided a ferrite core is used, may be tuned well either side of 70MHz. A can should be fitted to this coil to aid frequency stability.

Automatic Frequency Control of the oscillator was not found to be necessary in this application; drift on the prototypes was within a very few tens of Hertz per minute - after a five minute warmup period.

The oscillator signal is lightly coupled to the output buffer by means of a tap, well down the 'earthy' end of the coil. A series resistor and capacitor provides very light coupling (preserving stability) and also a means of adjusting the output level of the amplifier. The 220-ohm resistor shown at R3 is typical of that needed in order to drive a transmit ballanced mixer, however it may be either increased or decreased as required. If there is still insufficient output then the tap on L2 (nominally at 1-turn from the ground end) may be taken further up the coil. Care should be taken with this adjustment however since too high a tapping could adversely effect the frequency stability of the oscillator.

Since a FM-TV signal with a reasonable peak-to-peak deviation occupies quite a large bandwidth, the output amplifier (and subsequent stages) should be wide enough to cater for such a wide signal. For this reason a wideband transmission line transformer is used as the collector load for Tr4, details of which are given in Fig.3 and under the heading 'Components' later in the text. The output impedance of the amplifier is around 50-ohms enabling efficient coupling into the mixer which will typically be via a link into a double tuned circuit.

Provision is made after the pre-emphasis network to insert a 5.5 or 6MHz sound carrier. The resistor/capacitor combination (R1/C1) should be made suitable for the system used, values being typically 470-ohm and 470pF.

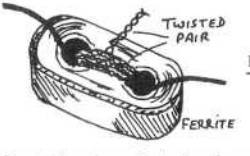


Fig.3

6-10t thin insulated wire bifilar wound onto a ferrite former or ring. Drawing shows typical 'surplus' shaped ferrite.

FURTHER CONSIDERATIONS

23cm transverters invariably have their local oscillators on the low side of the wanted frequency, this being so then sideband inversion will not take place in the mixer and therefore video inversion must not take place in the generator, (assuming that conventional

modulation standards are being used). The circuit in Fig.1 is non-inverting (actually double inverting) therefore, assuming no other mixes in the system, the signal should come out the right way up. If however a transmitter puts its local oscillator on the high side then an inversion will take place, therefore a similar inversion must also take place elsewhere in order to restore the status-quo. The circuit shown in Fig.2 is an inverting amplifier having a similar performance to the two stage one and may replace the circuit shown within the dotted lines if required.

To set-up the FM generator simply adjust the core of L2 for a frequency of 70MHz - measured at the output with a counter, after allowing a five-minute warmup period. No modulation should be present whilst this is done!

FILTER CONSIDERATIONS

Obviously it is in everyones interests to keep radiated harmonics to as low a level as possible therefore filters should be provided where appropriate. The 70MHz signal may be passed through a bandpass filter which should be centred on 70MHz. Carson's law states that the required channel bandwidth for a FM modulated TV signal is equal to twice the peak deviation plus twice the highest modulating frequency; a typical bandwidth for amateur transmissions could therefore be of the order of 15-20MHz.

As far as video is concerned a low-pass filter may be provided to cut off at around 5MHz. This will ensure that video does not get into the sound channel (particularly important if you are using digitally derived pictures from a computer). The choice of 5MHz ensures that the colour subcarrier is not attenuated but the option of both 5.5 and 6MHz sound is retained without the need to change the video filter.

COMPONENTS

L1 can be an ordinary fixed inductor or choke; the Toko range is suitable here. The BB109 diode is the green tipped device which has no suffix letter. L2 is a Toko coil as stated on the circuit diagram, however this may of course be hand wound on a coil former in which case around 8-10 turns of 24swg should be space wound on a former around 3/16" or 1/4" in diameter. A VHF ferrite core should be provided for adjustment purposes. L3 is wound on a suitable ferrite former. This may take many shapes: large bead (not the small ones widely used for decoupling and parasitic stopping), ring, single or double-holed moulding etc. Fig.3 shows the type used by myself and is typical of those available by the handful at rallies. The number of turns is not too critical (as long as there are sufficient to pass the required signal), 6 to 10 on a typical former is about right. The coils are bifilar wound using the following method: Take two pieces of thin insulated wire (wire-wrap is very good) and twist them together, wind this pair through the ferrite for a suitable number of turns, now connect one of the wires from one end to the other end of the second strand, this provides the three connections required. Two dots on the circuit diagram indicate the common end of each winding.

Most components are available from Bonex Ltd of 102 Churchfield Road, Acton, London W3 6DH (Tel: 01 992 7748) or from Cirkit Holdings.

My thanks to G8KER for his help in developing this design.

VINTAGE RADIO & T.V.

Mr.Journeaux, owner of the Journeaux Historic Wireless Collection, has recently joined the BATC. Aparently there are so many items in the collection now that they have to be kept in three houses. Every copy of Wireless World is included in the collection as are many other old magazines, and Mr.Journeaux has kindly offered to help members with information from back issues.

Any member who has anything which could be of interest to the collection is asked to write or telephone details please to:

Mr.H.H.Journeaux,
7 Blair Avenue,
Parkstone,
Poole,
Dorset BH14 0DA

THE JOURNEAUX HISTORIC WIRELESS COLLECTION

In 1970 Mr. Journeaux of Poole, Dorset, received a bequest of a large number of early wireless receivers, all in a very poor condition, with the hope that they would be eventually be restored to full working order.
During the next few years the story of the bequest and subsequent restoration was reported in the local press, radio and television.
This resulted in further donations of Vintage Wireless Equipment, including a large quantity of early Wireless books and magazines etc. It was therefore decided to incorporate everything into a historic wireless collection to include all items of Wireless History from 1900 to 1940. This has since grown into one of the largest private wireless collections in the country and now includes over 800 radios, televisions and related items, together with a reference library of 2000 wireless books and 3000 wireless magazines.
It is eventually hoped the whole collection will be on permanent display to the public. Until then most items are available on free loan for exhibition or research purposes.

TELEPHONE PARKSTONE (0202) 748072.

INTERNATIONAL ATV CALLING

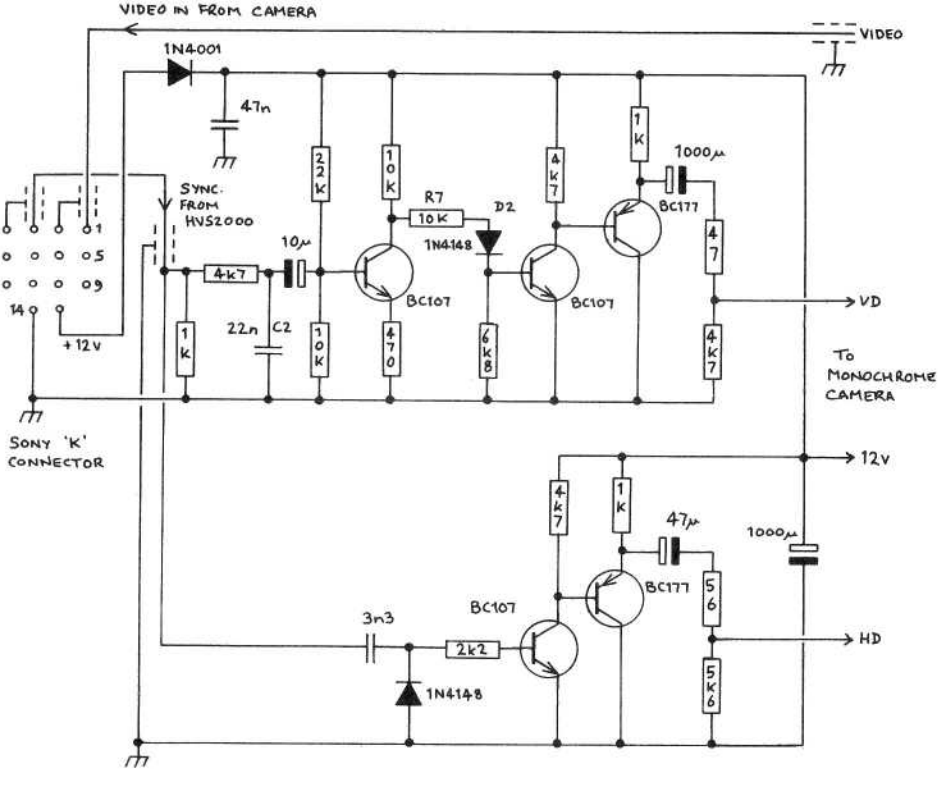
144.750 MHZ

MODIFYING THE SONY HVS2000 VIDEO MIXER

by Roy Humphreys G4WTV

This is the first of two articles describing some useful modifications to the Sony HVS2000 video mix/effects generator. This article describes a method of deriving suitable signals from the Sony unit in order to drive a monochrome camera.

The Sony HVS2000 video mix/effects unit has been mentioned before in CQ-TV, and represents excellent value for money (it has been available at around £30 although it seems that stocks are now just about exhausted). One of the main facilities it offers is the ability to key a caption from a monochrome camera, into a colour video signal with the option of colourising the caption. However, it is designed specifically to interface with Sony's own monochrome camera, and as such produces a non-standard drive waveform. In order to be able to drive a 'normal' camera, it is necessary to use an interface circuit such as that described here.



CIRCUIT

The Sony drive signal consists of mixed vertical and horizontal drives, but of opposite polarity. This circuit (see figure 1) separates the two components, and provides HD and VD signals of the correct polarity to drive a normal camera. There are two points which should be noted: firstly, the HVS2000 will not lock to a random-interlaced signal input, and secondly, the monochrome drive signals are directly derived from the input sync., and thus, if the input signal is interrupted, the output drives will cease. Hence, this circuit should only be used with a camera which will free-run in the absence of drives, otherwise scan failure could result in a burnt tube. The drives which this circuit produces are slightly delayed with respect to its input - in practice, this should not cause any problems. The value of C2 in the Vertical Drive path can be adjusted if necessary to reduce the vertical delay - however, the value of R7 will also need to be adjusted to ensure correct operation of D2. There will also be a slight delay in the Horizontal Drive signal, which will cause a shift to the right of the caption camera picture. However, this will not be a problem as long as the framing of the caption is viewed on the main monitor locked to the colour signal output.

CONSTRUCTIONAL NOTES

The layout of this circuit is not critical, and it may be readily constructed on Veroboard. There is sufficient room inside the Sony unit to accommodate this circuit if desired. If the rear plastic trim surrounding the connectors is removed, a hole is revealed which is just the right size to fit a DIN socket, which may conveniently be used to feed the monochrome camera. If the camera will operate from a 12-volt supply, it may be possible to derive this from the HVS2000 - it would be a good idea to check the camera's current consumption first! If the monochrome video input is also wired on the same socket, a very neat job will result, as all the wiring will be contained within the Sony unit. All the wiring for this mod. may be connected 'piggy-back' fashion onto the Sony K-connector already fitted, and thus does not prevent the alternative use of the Sony type camera if required.

The second article, which will appear in the next issue, describes how simple wipe patterns can be made from the Sony unit

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NEW 70cm CONTEST

APRIL FOOLS FIESTA

This brand-new 70cm ONLY contest is to be an annual event and will make its debut on the 1st of April 1986. The contest is a "whole-day" affair and the object is to enjoy it rather than win.

Don't be 'out' on all fools day, stir your stumps and make a day of it. Everyone gets a prize! HOWZAT THEN?

A brief outline of what has been accomplished in little over half-a-century

The following piece is taken from the very first issue of "Television" magazine (Vol.1 No.1) published in March 1928. Happily Television magazine is still going strong today, although things have changed a bit! The issue includes details on building a condenser type selenium cell, a simple Televisor and information on how to obtain a constructor's sub-licence which one needed in order to be allowed to build equipment to receive the Baird TV transmissions of the day.

I am grateful to Roger Bunney for sending copies of the original material, (Ed).

Television is the newest child of science, although even at this early stage it is an infant that shows great promise for the future, and therefore it is quite understandable that some people who have not closely observed the coming of this promising youngster might, on seeing the first copy of the first television journal in the world, exclaim "What *is* Television?"

Television is usually rather loosely defined as "seeing by wireless," for that is the popular term under which it so frequently masquerades. This is, however, hardly correct, for television is seeing by *telegraphy*, either with or without wires. The Patent Office, which defines such terms, makes this quite clear by correctly laying down that television apparatus is that used for "transmitting instantaneously to a distance images of views, scenes, or objects by telegraphy, either wire or wireless."

It may be regarded as reproduction of sight, for television enables us to actually, visually, witness living scenes, people, and objects at a distance just as if we were actual eye-witnesses on the spot. It means the transmission of the living image of living, moving things, with all gradation of light, shade, and detail, to a receiving screen where they are faithfully reproduced with all movements. Television, therefore, is instantaneous vision over any distance by wireless or wire. Natural colouring is not seen.

TELEVISION NOT PHOTO-TELEGRAPHY.

Television is frequently confused with photo-telegraphy, which is quite a different thing. Perhaps the most simple way to define the difference is to state that the former is *living* and the latter *still*.

Photo-telegraphy is the transmission of separate still pictures or photographs. Even "Webster's Dictionary" confuses telvision and photo-telegraphy, but it should be clearly understood that the one refers to vision of living scenes at

the moment of them taking place and the other to the mere sending of a "still" picture.

The history of television, or rather the history of television attempts, may be said to date from the discovery of the light-sensitive properties of selenium 54 years ago. Selenium, of course, is a metal, the electrical resistance of which varies when light falls upon it. The discovery of these properties was made quite accidentally in 1873 at the Atlantic cable terminal station at Valentia.

Three years after this discovery various experimenters had constructed selenium "cells", and it was imediately suggested that they would make it possible to see by telegraphy. Within the next few years many scientists described systems to accomplish this remarkable feat, and it was confidently asserted that vision over the telephone line would be an accomplished fact very shortly.

The problem of television was to break up each living image into many thousands of fragments, convey these "pieces" to the receiver and re-assemble them on the receiving screen in a fraction of a second. It is necessary to make a complete traversal of the screen in about one tenth of a second so that the images are seen instantaneously owing to the "time lag" of the eye.

ATV THREATENED IN U.S.

The eroding and proposed eroding of our valuable amateur bands by the authorities is, unfortunately, something which seems to continually raise its ugly head these days. We have heard recently of the problems being faced by our colleagues in such countries as West Germany, France, Belgium and Holland - to name just a few. Now it seems the rot is setting-in across the Atlantic in the U.S.A. According to a piece in the July issue of "Spec-Com" magazine the main ATV allocations are now under threat from business radio interests. The following extracts are taken from that article:-

MONEY TALKS

'There is no doubt that the undermanned and under-budgeted FCC has given in to the needs of the more powerful lobbying commercial enterprises, as well as its own self-employed ruling government agencies and military installations, against the protection of a much weaker amateur radio service. It additionally continues to ignore unquestionable 'illegal' RLS (Radio Location Service) violations to the amateur radio service, or delays action for up to two-years, as in one documented Calofornian case. The FCC's second report and order docket 80-739 provided for the removal of the 1215-1240MHz portion of the amateur 1200MHz band, in favour of the NAVSTAR positioning satellite service, as well as the removal of the 2310-2390MHz portion of the 2310MHz band to aerospace flight test users. But the "big blow" to the UHF amateur radio service was yet to come....:.

THE NEW THREAT TO 70cm

Announced to the general ham radio population in mid-May via W1AW, ARRL bulletins and other news media publications such as Westlink and W5YI reports, was word of a surprising move by the FCC towards a proposal labelled 'Docket 85-113' to band-share the longtime allotted amateur UHF 70cm low-end spectrum area of the 421-430MHz band, to business land-mobile interests; specifically (but not limited to) the initial cities of Detroit, Cleveland and Buffalo. A planned 204 new business-band channels (114 in Buffalo) is anticipated, with manufacturer claims of more than 48,000 radio unit sales and installations. Although un-named, it is suspected that it is the manufacturers who are once again pushing the proposed FCC legislation. General Electric and Motorola already manufacture equipment in this band area for Canada and the Middle-East, retailing in the $1,000 - $4,000 class range. The FCC docket 85-113 proposal is for PRIMARY business band use and not 'secondary' to the amateur radio service! More simply put; 'This means death to ATV simplex and repeater outputs' positioning requirements as it is known and enjoyed today! If enacted and later expanded into other areas, it's doomsday for 70cm ATV'ers.

THE BEGINNING OF THE END

It is believed that if this FCC proposal goes through, without a battle from amateur radio lobby groups and individuals, it will signal the beginning of the end for low-end 421-430MHz operation (especially for ATV'ers). The proposed FM business band operation will no doubt be vertically polarised (for mobile use) which will give some degree of partial security to those ATV'ers using horizontally polarised antennas. This legislation, if enacted, rivals that of attempts 10-years ago to ban the ham-TV mode from UHF frequencies. It was only through persistant lobying that the then threatening measures were finally defeated. As if it isn't enough to have to battle bordering operating restrictions, navigation pulse radar interference and government military installations, as well as our own internal controversies among ATV'ers, satellite users and SSB groups, the added limitation of a shared band with FM carrier business band users will be the final straw.

We urge all Spec-Com members and subscribers, ATV groups and clubs, as well as individual FSTV and other low-end mode operators to organise and write immediately to the FCC in Washington D.C., regarding the cancellation of docket 85-113, with the appropriate number of copies going to other chief personnel that perhaps could aid in the battle against this mode-threatening piece of legislation.'

IN THE STUDIO

Part 5 - STUDIO VIDEO RECORDERS

By John Goode.

Most people who are interested in the technical side of television these days will have had some dealings with domestic video recorders, and so I am taking the task of explaining the fundamentals of video recording to be outside the scope of this article. Rather, I will concentrate on the ways that studio machines differ from their domestic counterparts in order to achieve high performance with "programme production" facilities such as synchronous playback and editing.

Nowadays, there are really only two types of machine that one is likely to find in a small production studio -

(1) High Band U-Matic
(2) 1" C-Format

There are other formats, of course; but these are not likely to be on offer in this country at this time. The old 2" Quadruplex machines are still around, but these are considered uneconomic for new production, and are used mainly to replay old programmes. The other 1" type, Bosch Ferseh BCN (B-Format), has never really caught on in this country, although it is widely used on the continent. The only other format that could be on offer would be standard ("low-band") U-Matic, although this is regarded as "Industrial" rather than "Professional"; it would only be offered to the most "poverty-stricken" clients!

HIGH-BAND U-MATIC.

This is a development of the standard European (625/50) U-Matic, and it is of interest to trace the background story behind its appearance. During the Seventies the U.S. TV Networks began to use the standard 525/60 U-Matic to cover news stories in order to save on film processing, and thus the term "Electronic News Gathering"(ENG) was born. The U-Matic performed adequately in the U.S. for two reasons;

(1) The NTSC video signal bandwidth is restricted to 4.2MHz;
(2) Because of the 60Hz field-rate of US TV, the head-drum of the US machine

rotates at 1800rpm, and this gives a writing speed sufficient to provide pictures of comparable quality to 16mm colour film.

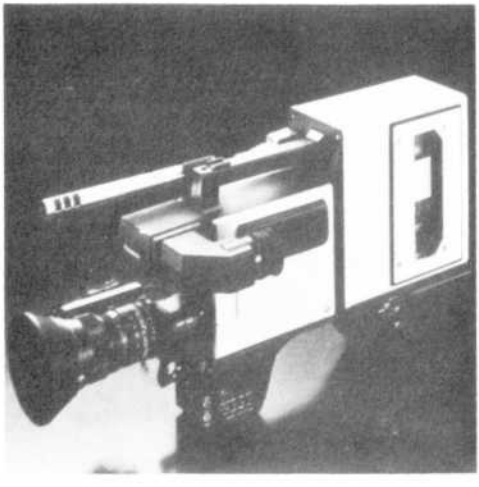
However, when the U-Matic format is adapted to European use on 625/50 systems two things change - both the wrong way!

(1) The required video bandwidth is increased to (ideally) 5MHz;
(2) Because of the lower field rate, the head drum speed drops to 1500rpm.

We therefore have to record a more demanding signal with a lower writing speed. (Incidentally, this same degredation occurs with all non-segmented helical scan vtrs that are converted from NTSC to PAL/SECAM operation - including VHS & Beta machines!).

Not surprisingly then, when the IBA and the BBC came to evaluate the European machine for ENG, they found that it could not measure up to 16mm film, and cast it into outer darkness. The main problem was in editing, because although first generation pictures (i.e., camera to vtr, no copying) were good enough, the quality degraded rapidly when edited, due to the copying involved.

The IBA and BBC suggested a specification to Sony for an improved machine that would meet their requirements, and in due course the high-band U-Matic was born. Because Sony was the only manufacturer of these machines, the format also became known as "BVU", after the model number prefix used by Sony. However, recently JVC has entered the market with high-band versions of their standard machines, and so "BVU" may not be appropriate soon.



Matsushita M-Wrap

Because high-band was developed for ENG, only two TYPES (not models) of machine are made - portable recorder and studio-based editor. In addition, a dedicated timebase-corrector and timecode based editing-controller complete the system. So, what is the difference between standard and high-band U-Matic? Well, the H.B. version is more solidly built with broadcast standard connectors (BNC/XLR), and a timecode track is over-recorded on part of the video tracks. An SMPTE/EBU Timecode generator can be fitted, and for broadcast use normally would be. The video tracks have been widened from 85 microns to 125 microns, improving signal to noise ratio. Using the latest head technology it has been possible move the luminance FM up in frequency (hence high-band), and the colour-under chroma channel has been moved up the band. In addition, a pilot-tone reference system is included to improve gain inequalities in the luminance and

chrominance channels.

The net effect of these improvements is to make the high-band machine "one generation" superior to the standard U-Matic. This fulfils the brief outlined by the Broadcasting Authorities. The differences between standard and high-band are:-

STANDARD HIGH-BAND

Video track width 85u125u

Luminance FM:-

Sync tip3.8MHz4.8MHz

Peak white5.4MHz6.4MHz

Colour-under frequency685kHz924kHz

Timecode track widthnone0.5mm

Note that due to the way high-band came into existance, it is the only Japanese-developed format that is unique to 625/50 television systems.

1" C-FORMAT VTRs.

The 1" C-Format machines represent the first generation of helical-scan VTRs to provide broadcast performance using a non-segmented scan. This is an advantage, since it is much simpler to provide "trick" effects such as still frame and slow motion when each recorded field occupies a single track on the tape. Previous broadcast helical designs (e.g. B-Format) use a small headwheel that rotates at high speed; consequently much less than one field is recorded on each track (in the case of B-Format, 52 lines), and so head-switching during the picture is necessary. (Hence the term "segmented scan"). With this form of recording, trick effects can only be achieved using a digital frame-store, a considerable extra expense.

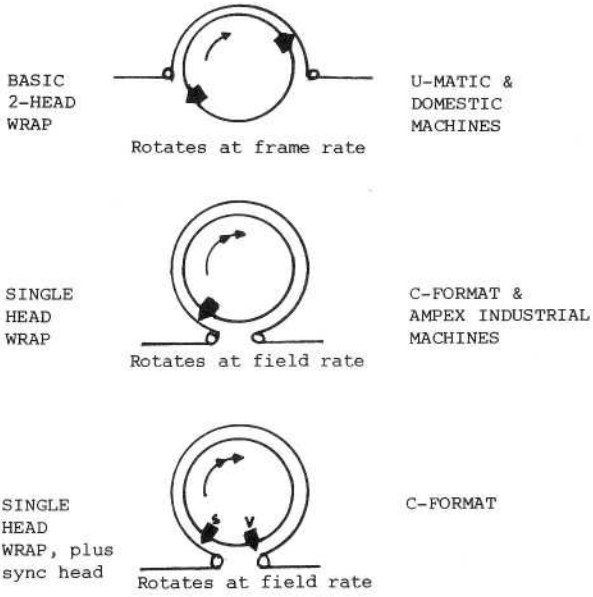
The reason that previous designs use segmented-scan is so that the head drum speed is not limited by the field rate of the television signal, as the non-segmented format must be. In this way a high enough writing speed is achieved so that the full video bandwidth can be recorded. On the B-Format machines this is 934"/sec; compare this with approx. 1500"/sec for 2" Quad machines, and 190"/sec for a VHS. With C-Format the head drum rotates once per field, having a diameter of 5.3". The tape is wrapped almost completely around the drum (346 degrees) and a single head is used. Unlike U-Matic, (which has two heads spaced 180 degrees apart, a 180 degree wrap, and a scanner speed of one rev. per FRAME), the C-Format uses a single head revolving once per FIELD as a means of doubling the writing speed. By this means a writing speed of approx. 835"/sec is achieved with a 50Hz field rate. With modern heads this is sufficient to record colour signals direct - that is, the colour subcarrier and sidebands are not separated from the luminance, but treated as a single composite signal and recorded using a single wideband FM system.

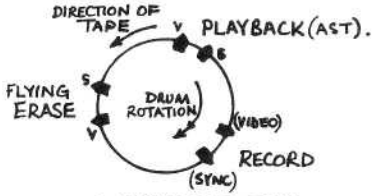
C-Format machines are presently available from Ampex (the VPR series), and Sony (the BVH series). They are open-reel machines, as the single-head wrap does not lend itself to the auto threading techniques that a cassette requires. The format offers 3 audio tracks (one for timecode), and there is

the option of a fourth audio track or a second video head. This statement requires some explanation.

With a single video head and a 346 degree wrap, there is obviously a period during each field when the head is not in contact with the tape (about 12 lines), and nothing is recorded. This is arranged to be during the vertical interval so that no picture information is lost; on replay the missing sync information is supplied by the machine's dedicated TBC. However, if required a second head can be fitted to the drum to record the 12 or so missing lines (plus an overlap) in the vertical interval. This could be necessary if these lines were used for programme identification (using teletext-type techniques); some organisations apparently do this. The option is therefore for this, or an additional longitudinal track.

NON-SEGMENTED HELICAL SCAN





C-FORMAT HEAD DRUM

Having explained that a single head machine can have a second head on the drum ("sync head"), it is time to confuse the issue even more, and admit that the scanner may carry up to SIX heads. It is normal for C machines to be fitted with separate replay "confidence" heads; these heads are fitted on piezzo-elecric bimorph mountings to give automatic tracking for noiseless still and slow motion playback. The third pair of heads to be carried on the scanner are flying erase, for editing. Of course, if the machine has the fourth audio track fitted, the scanner will only carry three heads. However, in this case 3 dummy sync heads will be fitted to maintain mechanical balance.

As a comparison, a chart is included to show the FM bands used in the various direct-colour recorders on the 625/50 system:-

1. 2" QUADRUPLEX

Low Band High Band Super Hi-band

Sync tip,MHz5.07.1611.0

Black level,MHz5.547.811.35

Peak white,MHz6.89.312.2

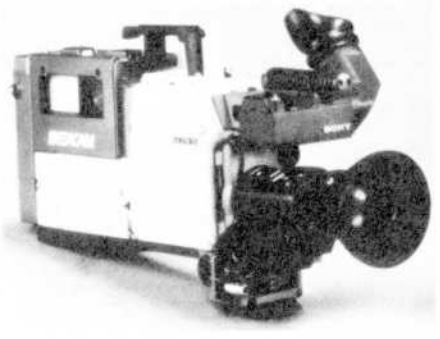
2. 1" BROADCAST FORMATS

B-Format C-Format

Sync-tip,MHz6.767.16

Black-level,MHz7.407.68

Peak-white,MHz8.908.90



All studio machines have full editing facilities, with provision to interface to a computerised edit controller for up to three machines. The editing decisions are implemented using SMPTE/EBU timecode, a system of recording digital information on one of the audio tracks that uniquely addresses every recorded video frame on the tape. With three machine editing there are two source machines fed via audio and video mixers to the editing recorder. In this way transitions other than simple cuts can be incorporated by using the so-called A/B roll technique - both source machines are run up together, and, because their dedicated TBCs make them synchronous sources, mixes, wipes, chroma-keys and other special effects can be performed between them. With a fully computerised system, these special effects can be pre-programmed from a menu, rehearsed until the operator is satisfied, and then memorised and performed under the computer's control.

TIMEBASE CORRECTION

As stated above, Studio C-Format machines are normally equipped with dedicated timebase-correctors. This is for two reasons:-

(1) With direct recording of the colour subcarrier, there is no means of separately correcting the effect of the timebase errors on the colour signal as there is with the colour-under heterodyne system used on U-Matic machines. Consequently, it is not possible to playback in colour without the TBC; however, with the TBC, since the luminance and chrominance are recorded and corrected as one signal, the sc/h relationship is preserved.

(2) The "trick" effects that the automatic tracking system makes possible have to be "sorted-out" by the TBC so that whatever playback mode is selected - fast, slow or still, forward or backward - the sequence of pictures at the output follow the full 8-field PAL specification. The way this is done is beyond the scope of this article, but suffice to say that some very tricky signal processing is involved.

Conversely, TBCs for use with H.B.U-Matic must separate the chrominance, as this has been heterodyne stabilised, whereas the luminance has not. This means that the sc/h relationship is lost, and so the TBC must restore this. This can be done by timebase correcting the luminance and chrominance separately, and then decoding to Y.U.V. Recoding to PAL then restores the signal to full broadcast specification.

NARROW GAUGE ENG FORMATS

Although not strictly within the definition of "studio recorders", a recent development is that of the ENG "Camcorder" - that is, a combined camera and recorder, compact enough to be carried and operated by one person, and capable of performance equal to, or better than H.B. U-Matic. Three formats have emerged:-

(1) Sony Betacam (records on Beta cassettes)

(2) RCA Hawkeye/Matsushita M-Format (records on VHS cassettes)

(3) Bosch Quatercam (records on 6.25mm wide cassetted tape)

In all cases the tape forward speed is such that the maximum recording time for a cassette is 20 minutes. In the case of the Betacam system 20 minutes is recorded on a cassete that would last 3hr 15min on a domestic machine; with M-Format, 20 mins requires the equivalent to a domestic E180!

These systems achieve their performance by recording the colour signal in "component" rather than in the normal encoded form. Because the camera is linked directly to the recorder it is possible to take the signal in its Y.U.V. form. The U (B-Y) and V (R-Y) signals (which are only of 1MHz bandwidth) are then multiplexed together so that there is a single colour signal; this is then allocated its own channel in the recorder, being recorded on its own helical track, quite separate from the luminance. The head drum therefore has two sets of heads, one for Y, and one for U/V; the Sony and Bosch machines use slant azimuth to reduce crosstalk between tracks. It should be noted that, unlike HB U-Matic, the colour signals are FM recorded, and this leads to a great improvement in colour stability and signal-to-noise ratio. Naturally, there can be no problems with cross-colour or cross-luminance, and it is unnecessary to restrict the luminance to 3.5MHz; in fact, the luma channel bandwidth is about 4MHz. In addition, chroma/luma delay is much better.

It might be thought to be peculiar that a system using narrow gauge tape is capable of superior performance to that of a proven threequarter inch system. Our confusion is not surprising as we have always in the past associated increase in tape width with increase in quality. However, the increase that is of real significance is increase in AREA of tape used, and in fact due to the fast forward speed of the component recorders they in fact use a greater area of tape per unit time than U-Matic does - the laws of physics still hold!

It is too early to judge the impact of the new "component" recorders, but already manufacturers are offering editing and mixing systems that handle the signal in Y.U.V. form, in order to minimise degredation; with this system the idea is that quality is best preserved by leaving encoding as late in the chain as is possible.

This completes this series of background articles on small Studio Practice. None of the generalisations that I have had to make in this series should be taken as "chiselled in granite" - there are always exceptions. Nevertheless, I hope that I have given some idea of studio working to readers who have no experience of the subject.

Further Reading:-

Videotape Recording (Third Edition) by Joseph F.Robinson & Stephen Lowe. Focal Press.

Video Techniques by Gordon White. Newnes Technical Press.

AMPEX C-FORMAT VPR 6

TV ON THE AIR

(Photo - G3XKX)

By Andy Emmerson G8PTH

Welcome back to our three-monthly activity newsspot. It is written, auspiciously I was going to say, on the first day of the annual international ATV contest, but looking out of the window I don't think auspicious is quite the word. After a week of indian summer, with even a couple of nights of improved tropo conditions, it is raining hard - this will make it interesting for the stations who have elected to go out portable for the contest! Never mind, I hope you had success, anyway.

On seventy centimetres new stations continue to spring up. One such is Rob G4IPL who resides in Towcester, 'a real hole'. (I presume he means from an RF viewpoint, after all they make Towcester cheesecakes there, a most pleasant local delicacy!). With just half a watt he manages to get a P1 signal to Albert G8UGU in Great Brington, which is not bad for a 10 mile path. He has also joined the BATC, welcome aboard Rob.

Talking of QRP, BATC member F2XO in Boulogne tells me of some experiments in the Pas de Calais area. On September 1st F1ESA in Oye-Plage tested a new transmitter designed by F3YX. With just 100mW he got a P4 picture over the 18km to F1FCS in Calais.

Moving up the bands we come to twenty four centimetres, on which Albert G8UGU has now established himself. Continuing our QRP theme, he bought the Solent Scientific 200mW transmitter and was pleased to find this worked first time, giving 150mW into a 20-turn helical set 10 feet above ground. With this QRO setup he manages to get a P4 picture to yours truly in Northampton. This is a 6 mile path, almost line of sight, and indicates the possibilities of 24 cm. Albert is now working on the PA design from the last issue of CQ-TV, also the new modulator design from Wood & Douglas, which will enable him to put audio on his transmissions.

Repeater news now. GB3PV is the proposed TV repeater for the Cambridge area: the chosen site is Madingley, near the BBC aerial. The receiver is already complete and tested, and a licencing application - for 1kW e.r.p. - has now been submitted. I have to agree with Chris G4HCL that this 'will hopefully provide a useful service' - certainly the 25 watts e.r.p. allowed on existing repeaters restricts their coverage unduly. Requests for further info (and letters of support!) to Chris Lorek G4HCL, 11 Bevills Close, Doddington, March, Cambs., PE15 0TT.

The new Hastings TV repeater is a project of the Hastings Repeater Group, and is to be co-sited with GB3ES and GB3HE. This site is 140 metres above sea level, with a good takeoff in all directions. Antennas will be of the Worthing pattern, to cover just Hastings initially but with additional aerials added later to increase coverage. Special features planned for the repeater are teletext-type pages, accessed at first by RTTY or ASCII commands but later 'hidden' in the vertical blanking interval as per broadcast TV. Another possible feature is an automatic steerable search aerial. Constructor of the transmitter/receiver and control logic is Brian G4BCO.

Well-places in previous contests were G4ARD and G4VBS
How will they do this time round?

Several people in the Hastings area have already built equipment for 24cm TV, including G4KMJ and G1FTX. Present proposals are that the 'box' should be AM or FM in, with output on AM (channel RMT1) only. Perhaps wiser counsel will prevail, perhaps the RSGB repeater management group will ban AM, perhaps pigs will fly! Anyway, thanks to Tim Anderson for the info.

Finally a letter from Charles Brain G4GUO (Ferring, Sussex). 'I'm getting interested in ATV again after a lapse of a few years and have rejoined the BATC. I've just finished (well not quite) the G3WCY/G4ENA SSTV system. I did originally put the colour memories in but it didn't work properly so now I'm back with black and white on rx/tx. I still have problems as when the width is increased for 50Hz pictures every fourth pixel does not get written to, also I have had to slug the D out lines of the memories with 100pF capacitors to get the tx board to function properly. (Any ideas, folks?). However it works and I have contacted the normal WW/CDK/OQD crowd on SSTV.

'I intend building a variant of G3OQD's lightpen for captions, answering CQ calls and so on. But I wish fewer people would use computers to generate their slow-scan messages as they are very boring - and an inefficient way of using the medium.

'I received a couple of good pictures from the Space Shuttle using G4BCH's FT290R and my 4-element Yagi, and we played them back on Pete's colour SSTV converter. I have seen most of the other pics on 80m and in the Essex 2-metre SSTV net (I work at Chelmsford for Marconi's in TV development!). That's about as far as SSTV is concerned.

'Now for 24cm. I'm about halfway to radiating on 24: so far I have built a receive converter and two-thirds of the transmit chain, with just the tripler to construct. I've already made a 'Worthing' aerial and because my main station is near Worthing I'm in a fine position as far as activity is concerned for TV operation, with GB3VR shortly moving to its new site over at Brighton. Well, I hope I've done my bit to show there is some slow-scan activity.'

Indeed you have, and thanks for the letter Charles - I can always use more like it! In fact this time we are not exactly flush with activity news, so I thought I'd mention a couple of points which may be of interest if you're keen on construction. 'VHF Communications' is always a good read but does not regularly carry ATV articles. The 4/84 issue is an exception, with a project by Dieter Meendermann DC1BP for a colour test card generator. This interesting device produces a choice of two separate PAL colour images stored in a 2764 EPROM. Chip count is just 15 and the project is built on a standard 100 x 160mm Eurocard, which is available from the magazine. The 'active' devices are a ZNA234 pulse generator and the LM1886/1889 combination for producing the colour. Two of these jobs have been built and both owners are very satisfied: check out the magazine at a good library if you are interested.

The other point concerns good mail order service; most of us have to rely on the post for buying specialised components, and this can be a gamble at times. I am pleased to give credit where it's due, so this is a plug for Bonex Ltd of Acton, London W3. They keep a comprehensive range of Toko coils and R&EW kits, usually more than the distributor has in stock, so it is worth trying them first (and avoiding that depressing 'out of stock' printout). On the one occasion when Bonex sent the wrong item it was corrected by return of post, with some extra components as a bonus, so well done lads!

That's it for this time. We can do with a few more letters for the next roundup, so don't keep all the news to yourselves. Drop me a line at 71 Falcutt Way, Northampton, NN2 8PH or leave a 3 minute message on 0604-844130.

Where can I get.....?

By David Wilson

Quite often I get people asking where they might obtain second-hand equipment such as monitors, vision mixers, sound mixers, cameras and the like. Besides looking in the "Market Place" section of CQ-TV there are a number of other sources of such 'non-domestic' equipment in the video section of "Exchange and Mart". Another possible source is the classified advertisements section of the trade magazines such as Audio Visual or Broadcast Systems Engineering or Televisual, that it if you have access to copies. An alternative to this is to telephone or write to some of the hire companies to find out when they have sales of their ex-hire equipment.

Single copies of Audio Visual magazine are obtainable, price £1.90 post paid, from; Audio Visual, Maclaren Publishers Ltd., P.O.Box 109, Maclaren House, Scarbrook Road, CROYDON, Surrey CR9 1QH. Tel: 01 688 7788.

Televisual magazine is available at £2 per copy from Televisual Magazine, Circulation Department, 60 Kingly Street, London W1E 5QZ. Tel: 01 439 4222.

A TUNABLE SOUND DEMODLATOR

By Mike Wooding G6IQM

Due to the tendency, inadvertently though it usually is, of stations often not having their sound subcarriers exactly on 6MHz, plus also the need for some (lucky) stations needing to provide sound demodulation at 5.5MHz in order to work into the Continent. This circuit, which is tunable between about 5 and 7MHz, is offered as one solution.

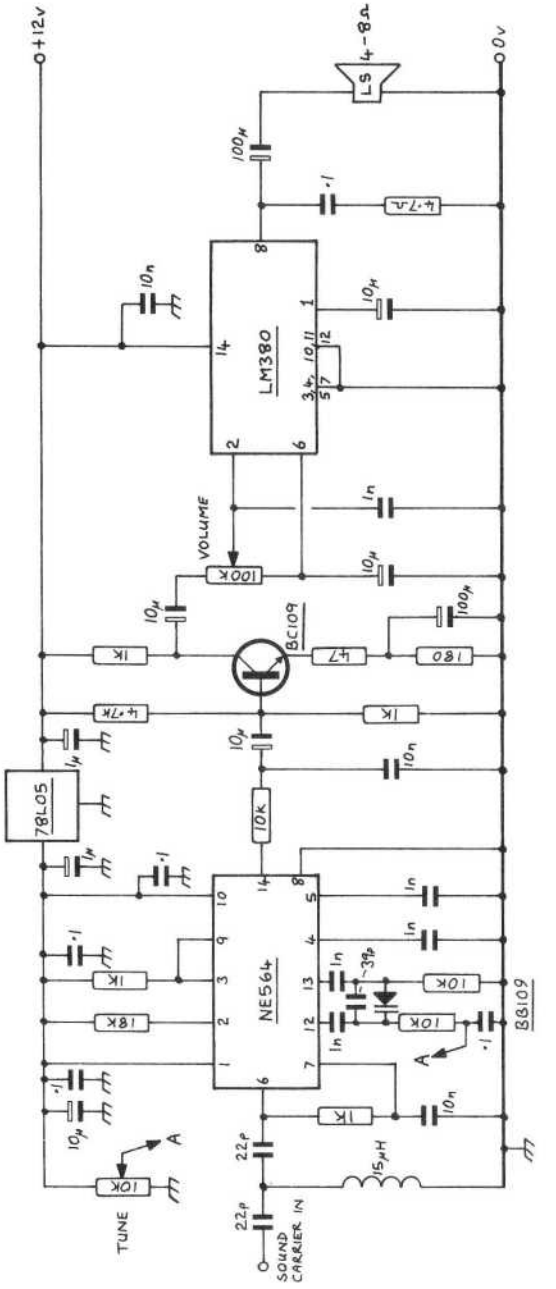
The design is straightforward, using the now familiar NE564 PLL often used for FM-TV demodulation on 24cm and above. A simple filter is provided at the input in order to keep unwanted noise to a minimum, and a varactor diode is used to tune the VCO so that tuning can be made continuously variable. A panel mounted control is available for tuning and the circuit "locks on" to the incoming signal ensuring good stability, provided the incoming signal does not drift out of the PLL locking range.

In this instance the NE564 is run at five volts d.c. as I believe that better stability is obtained at the relatively low PLO frequency - the prototype drifted only 15ppm over a 1 hour test after a very short warmup period. The audio stage can use any of the many op-amp's available, or even discrete transistors if required; the LM380 was chosen because I had one in stock and they are readily available. The BC109 pre-amplifier is necessary when using the LM380 but, if a different op-amp is used, then it may prove unnecessary.

One possible improvement I have found during testing is that the 39pF capacitor in parallel with the varactor diode could be replaced with a 1-60pF trimmer, this would enable more accurate range setting and would allow for any production variations in the BB109 and it's associated components. Also it would allow other varactor diodes to be used - I am using an STC VQA418B at present which has a different voltage/reactance curve; a trimmer would provide simple compensation.

Construction should preferably be on a double sided PC board, the topside being used as an earth plane. However, other methods of construction could undoubtedly be used provided reasonable care with layout is taken. Component leads should be as short as possible and the NE564 should be soldered into place rather than using a socket. The whole board should preferably be mounted in a screened box. The leads to the tuning control should not be made longer than necessary and the connections to the volume control should be made using audio screened lead.

If you are using this circuit with the BATC FM demodulator board (or similar), then the input may be connected straight to the pin provided. Other demodulators may need impedance and/or gain matching in order to transfer the sound signal correctly. The NE564 however has a very good dynamic operating range accepting very low input levels - the prototype fully quieting at -64dBM.



TUNABLE SOUND DEMODULATOR AND AUDIO OUTPUT

'ere, turn your dev' down a bit!

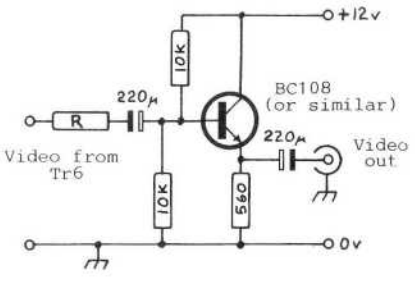
By John Wood G3YQC

Do you keep asking stations to turn down their deviation on 24? Listening (and working) on the air it would seem that many of you do. Having looked into the problem a bit, particularly at offending(?) station's receivers, these suggestions may help.

Accepting the fact that some stations do transmit (experimentally) too much deviation for the type of demodulators which we generally use, the other single most common fault is that of too much or distorted video. The level of recovered video from a demodulator is directly proportional to the frequency deviation of the signal. It follows therefore that, since some stations will be deviating more than others, it is difficult to set a receiver's video output level to a suitable value. The problem then is that if your video gain is set too high, and you are receiving a wide-deviation signal, the recovered video is likely a) to be larger than the monitor can cope with (causing poor syncing) and b) sync (or video) crushing may occur in the video amplifiers.

I have looked at several receivers recently and, almost without exception, the general level of video output is too high. It is most important to get it right and the obvious way is to connect a 'scope to the video output (whilst receiving a well deviated signal) and adjusting the gain for 1v p-p across a 75-ohm load. If you havn't a 'scope then turn the monitor's contrast control to maximum and adjust the video gain of the receiver until the picture is just slightly too contrasty, this provides sufficient range on the contrast control but ensures that the input video is not overloading.

The Wood & Douglas VIDIF board is particularly interesting. The demodulator is capable of correctly receiving quite wide deviations (generally a little more than the BATC board), however, in my experience, the larger video levels cannot be reduced enough by using the on-board control, (which doesn't seem to work much at all), and the video is often crushed. Investigating further I found that even when receiving very wide deviations the signal generally doesn't distort until it reaches the output amplifier (Tr7,Tr8). Using a 'scope I found that in fact there is usually over a volt of video available at the output of Tr6 (the invert switch), so I decided to do away with the on-board output amplifier and use a simple emitter follower instead.



The circuit I use is a conventional emitter follower. The resistor 'R' adjusts the output level of the video and should be selected on test - a suitable starting value could be around 220-ohms. The wire link selecting the vision sense should be disconnected at the common pin and connected to 'R' on the new circuit. Terminate the output in 75-ohms and adjust 'R' as detailed above. Now I find that no matter what level of signal is received the video never distorts.

A STRIPLINE FILTER

By Peter Johnson G4LXC

Due to the poor front-end selectivity of the BATC and other 24cm ATV down converters, it is necessary in many areas to use a selective filter to avoid broadcast TV signals entering the converter. Various filter designs are being used by amateur stations, but the main problem seems to be that most of them are very narrow and consequently need re-tuning for different parts of the band. A design which goes a long way towards improving this situation makes use of a new filter design in stripline.

This technique makes use of the fact that a stripline has a low Q factor and therefore wider bandwidth. The VHF-UHF Compendium outlines the design criteria and it is here that the principal arrangements are found to produce stripline circuits that work well.

PTFE printed board material produces striplines with much higher Q factors, therefore the advantage of fibreglass material is employed due to its much lower Q. 1.6mm thick fibreglass, double sided PCB is ideal for the filter which I shall describe here. The basic unit is illustrated in Fig.1 whereas fig.2a and b shows a more compact variation for use in tight spaces.

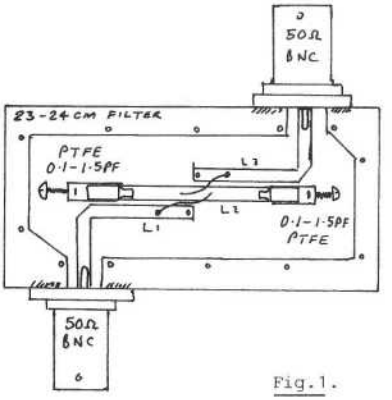


Fig.1.

L1*. 20mm x any length from angle to socket.

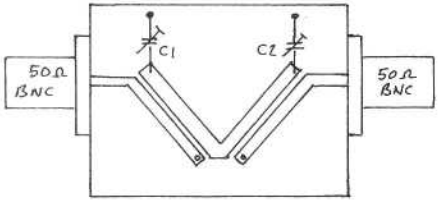
L2. 40mm x 2.5-2.9mm.

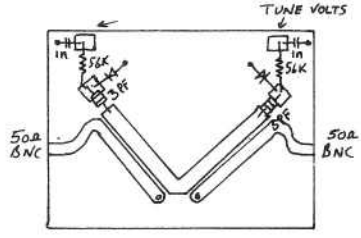
L3*. 20mm x any length from angle to socket.

* L1 and L3 are both 2mm wide. The gap between lines should be around 0.5mm. L1 and L3's ends should be pinned through to the ground plane.

CONSTRUCTION

The top and bottom ground planes should always be pinned through with 16-18swg copper wire at intervals of not greater than ¾". Coupling between striplines which are of bare copper is very small, therefore solder should be flowed liberally along the lines, this provides the necessary increase in surface thickness needed for optimum coupling. It is also possible to join the lines at the points indicated in Fig.1. In order to provide adjustment of the coupling, two pieces of 22swg plastic coated wire, around ¾" long and bent towards each other will form a very small value capacitor; the value for optimum coupling being around 0.5pF.





Total length of 'V' section = 35-40mm x 2.9mm wide.
Ground plane on the reverse side.
C1 - C2 = 0.1 - 1.5pF PTFE tubular or a matched pair of varicap diodes if the remotely tuned version shown above is used.

Figs.2a and b

TESTING

Assuming suitable test equipment is not available, the filter's performance may be assessed by using a low-level signal from a transmitter which can be tuned over the band required. A Suitable RF detector may be constructed according to the circuit shown in Fig.3. The components are mounted directly onto a standard BNC socket using the shortest lead lengths possible - the capacitor is a standard ceramic feedthrough type. Feed the low-level test signal into this probe and observe the meter reading. Now connect the generator to the filter and the probe to the filter output, adjust both trimmers for maximum output and compare the reading with the previous one. Now bend the two pieces of wire from their vertical position until optimum coupling is acheived shown by minimum insertion loss, (maximum indication on the meter). The probe will give a rough idea of insertion loss although, if possible, a method should be found to calibrate it. Losses on filters so far built have been around 0.5dB. The bandwidth may be ascertained by varying the input frequency of the test signal and observing the output indicator.

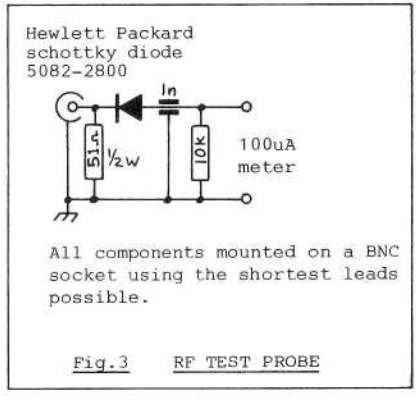


Fig.3 RF TEST PROBE

APPLICATION

The filter should now be ready for use in front of the BATC (or other) converters having breakthrough problems, and should, hopefully, provide complete attenuation of broadcast interference. In common with all such units, the BATC converter is best housed in a totally screened box and the power connections made via a feedthrough capacitor and an RF choke, this to avoid BCI entering by other routes. The TV varicap tuner used as an IF should also be contained in the same box as the converter, this will considerably reduce pickup of unwanted signals. The IF output at 36MHz is taken out via a BNC socket, and tuner volts should also be routed via a feedthrough capacitor and RF choke.

IN RETROSPECT

SOFTWARE NOTEBOOK - CQ-TV130 (CBM-64)

Slim Haines, G4IPZ - the author of the program - has reported a missing colon from line 10 of the listing. It seems that line 10 SHOULD read:

```
10 FOR I = 1024 TO 2023 : POKE I,224: NEXT I : REM SET UP SCREEN
```

The colon after the FOR statement is the rogue.

MONITOR CONVERSION FOR THE THORN TX90 - CQ-TV 131

Alan Warne, G4EZO advises some changes to the original article:

Page 12 - "PC1130 CONVERSION" Step 3 should read:
3. Remove C174 (470n), located near the rear edge of the PCB.

"PC1140 CONVERSION" Add note as follows after '5':
NOTE: R31 (470R) resistor should be fitted in line with the cable marked L106/R126. The preferred way is to mount the resistor vertically into the interface board using the hole marked L106/R126, then soldering the interconnecting lead to the top of it.

AN FM-TV RECEIVER - CQ-TV122 & REVISED ATV HANDBOOK

A noticable improvement in visible noise (white specking) can be effected by replacing C16, at pin 5 of the NE564, with a 2.2n capacitor. This modification alters the response of the PLL loop filter to a value more suited to our application. Thanks to G4MQS for this one.

ELECTRONIC CAPTION WRITER - Micro & Television Projects

Trevor Brown has sent in a couple of items relating to recent BATC publications. The first one deals with the caption writer on page 7. It seems the 74S262 character generator chip is becoming rather scarce (and expensive).

Unfortunately there is no plug-in replacement chip available so an alternative item in the form of a pre-programmed E-PROM (2716) has been developed for the unit. The E-PROM's are available from BATC Members Services but, since they are not pin compatible with the

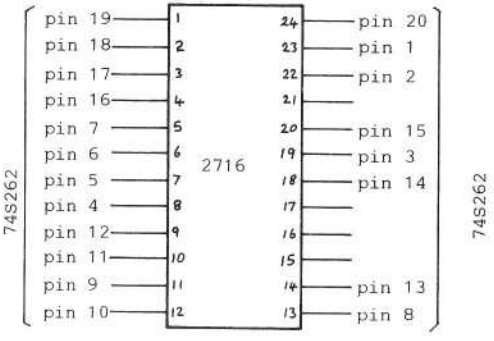


Fig.1. PRE-PROGRAMMED SUBSTITUTE FOR 74S262

PUBLICATIONS

QTY	PUBLICATION	PRICE EACH	UK P&P	TOTAL inc.P&P
.....	The revised AMATEUR TELEVISION HANDBOOK by T. Brown G8CJS (155gm)	£2.00	0.40	.....
.....	TV FOR AMATEURS by J.Wood G3YQC (85gm)	£1.50	0.25	.....
.....	MICRO & TELEVISION PROJECTS by T.Brown G8CJS (140gm)	£3.00	0.50	.....
	CQ-TV BACK ISSUES. The following issues are still available although stocks of some are low. Please circle those required.			
.....	127, 130, 131, 132..... *Please estimate appropriate postage (approx 90gm per copy)	£1.00	*	.....
.....	RE-PRINTS. Photocopies of any article from past issues of CQ-TV are available	0.20 sheet	0.20	.....
.....	INDEX. All main articles in past issues of CQ-TV and 5 Handbooks. Inc. page count, (essential for ordering re-prints). (40gm)	£1.00	nil	.....
		TOTAL		£ .....
		ANY EXTRA POSTAGE		£ .....
		TOTAL ENCLOSED		£ .....

Weights indicated above are in Grammes and are to assist in estimating the correct amount of postage. Overseas members should ask for a postage quotation before ordering and should NOT pay by foreign cheque.

Please send orders for publications only to:-

BATC PUBLICATIONS, 14 LILAC AVENUE, LEICESTER, LE5 1FN, ENGLAND

BLOCK LETTERS PLEASE

name	call
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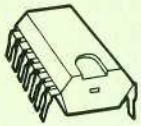
MICRO AND TELEVISION PROJECTS

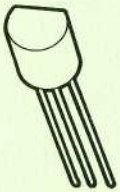
BY TREVOR BROWN



ANOTHER BRAND-NEW ATV BOOK FROM THE PEN OF TREVOR BROWN.

THIS ONE TAKES THE LEAD IN DIGITAL ELECTRONICS AND INTRODUCES IN A PRACTICAL WAY THE ALL-IMPORTANT SUBJECT OF USING A HOME MICRO-COMPUTER IN THE ATV SHACK OR STUDIO. THOSE WITH OTHER INTERESTS HAVE NOT BEEN FORGOTTEN THOUGH AND YOU WILL FIND MUCH TO INTEREST YOU.

CONTENTS INCLUDE:



Test pattern and sync generator.
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RS232 E-Prom programmer.
Spectrum freezer.
Teletron.
Teletron VDU.
Ham text.

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MEMBERS ONLY

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QTY	CAMERA TUBES, SCAN COILS, BASES & LENS MOUNTS	EACH	P&P	TOTAL
.....	1" Vidicon scan-coils (low Z focus coils)	£6.00	£1.20	.....
.....	1" Vidicon scan-coils (high Z focus coils)	£6.00	£1.20	.....
.....	2/3" Vidicon scan-coils	£6.00	0.80	.....
.....	Vidicon bases - 1" or 2/3" (state which)	0.50	0.17	.....
.....	Vidicon camera tubes - see below	-	-	
.....	TV camera lens mounts - 'C' type	£1.00	0.24	.....
.....	Image Orthicon camera tubes type 9565 **	£10.00	+	.....
.....	Photomultiplier tube type 9656A **	£2.00	0.60	.....
.....	Photomultiplier tube type 6097F **	£2.00	0.60	.....

(+ Buyer to arrange transport).

TOTAL THIS PAGE £.....

A variety of camera tubes can be obtained from Thorn-EMI and English Electric Valve Co. Members with special requests should contact Members Services at the address given below. 1" and 2/3" Vidicons can be obtained at a cost of £25 each, including post and packing etc. 1" tubes are available in different heater ratings (95 and 300mA) - 6" long, and also a 95mA 5" long version; (EMI types 9677, 9728, 9706 and EEV types P849 and P8031). 2/3" tubes have 95mA heaters (EMI type 9831, EEV type P8037). All tubes are of separate mesh construction. Both Leddicon and Ebitron tubes are also available. Members requesting information on different types of tube or equivalents for other manufacturers are asked to send a stamped, addressed envelope for their reply.

HB1 = ATV Handbook - blue. HB2 = ATV Handbook vol.2.
TVA = TV for Amateurs. MTP = Micro & Television Projects

QTY	PRINTED CIRCUIT BOARDS - HANDBOOKS	EACH	P&P	TOTAL
.....	Amateur television receiver (HB1)	£1.50	0.30	.....
.....	Electronic character generator (HB1)	£3.00	0.30	.....
.....	Colour test card (set of 3-double-sided)	£15.00	0.60	.....
.....	Horizontal aperture corrector (HB1) **	£3.00	0.30	.....
.....	PAL colour coder (HB1)	£3.00	0.30	.....
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.....	Vision switcher matrix (HB2)	£4.00	0.30	.....
.....	Vision switcher logic (HB2)	£4.00	0.30	.....
.....	Vision mixer (HB2)	£4.00	0.30	.....
.....	70cm VSB transmitter-7 boards (HB2)	£15.00	0.40	.....
.....	SSTV pattern/sync generator (HB2)	£3.00	0.30	.....
.....	Character colourizer,(printed legends HB2)	£5.00	0.30	.....
.....	70cm TV transmitter (TVA and CQ-TV122)	£3.00	0.30	.....
.....	ATV up-converter (TVA and CQ-TV112)	£2.25	0.30	.....
.....	Spectrum user port (MTP)	£3.00	0.30	.....
.....	Spectrum PROM blower (MTP)	£3.00	0.30	.....
.....	Teletron (MTP)	£3.00	0.30	.....
.....	SPG, greyscale, char gen (MTP)	£4.set	0.60	.....
.....	Keyboard add-on (for above char. gen) (MTP)	£2.25	0.25	.....
	CQ-TV & MISCELLANEOUS			
.....	'Project 100' sync generator (CQ-TV100)	£3.00	0.30	.....
.....	TX-9 video/audio in/out (CQ-TV119) **	£2.25	0.30	.....
.....	FM-TV demodulator (CQ-TV122)	£3.00	0.30	.....
.....	Video filter (TVA and CQ-TV122)	£1.00	0.17	.....
.....	Sync processor (CQ-TV129)	£3.00	0.30	.....

TOTAL THIS PAGE .....

QTY	SLOW-SCAN TV	EACH	P&P	TOTAL
.....	G3WCY SSTV to FSTV RX converter & reprint (Radio Communication - Feb.1983)	£10.set	0.60	.....
.....	G4ENA modifications for above CQ-TV127 - set of 4	£5.set	0.30	.....
.....	G4ENA SSTV transmit board (CQ-TV129) (Add-on to G3WCY converter) NB: Incorporates LSC and width circuit as in G4ENA SSTV mods. PCB set (above).	£6.00	0.30	.....
.....	G4ENA SSTV aux board (CQ-TV130)	£2.00	0.20	.....
.....	G8CGK SSTV pattern generator - inc. notes	£3.00	0.30	.....
	STATIONERY, ACCESSORIES AND COMPONENTS			
.....	BATC test card - with data sheet	0.50	0.24	.....
.....	BATC reporting chart (illustrated)	0.12	0.20	.....
.....	BATC lapel badge - diamond - button hole	0.40	0.17	.....
.....	BATC lapel badge - round - pin fastening**	0.50	0.17	.....
.....	BATC key fob	0.60	0.17	.....
.....	BATC equipment stickers - 1" round	0.15	0.17	.....
.....	BATC windscreen stickers - 2.5" round	0.10	0.17	.....
.....	Surplus delay lines (not KT-3) **	0.40	0.20	.....
.....	13.14MHz TV TX crystal (HB2)	£5.00	0.17	.....
.....	108.875MHz TV TX crystal (TVA)	£7.00	0.17	.....
.....	5MHz SPG crystal for P100 (CQ-TV 100)	£2.75	0.17	.....
.....	4.433618MHz PAL colour subcarrier crystal HC18-U (wire leads)	£2.75	0.17	.....
.....	TBP28L22 PROM. Pre-programed for colour test card circle. (eqt.74S471)*	£10.00	0.25	.....
.....	2732 E-PROM. SSTV program (HB2)	£12.00	0.17	.....
.....	2716 E-PROM - programed as a substitute for 74S262 (see mod in CQ-TV132)	£5.00	0.17	.....

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*SPECIAL NOTICE - PROM's for test card circle.
Some of the above PROM's have been incorrectly programed by our suppliers. If you have purchased a TBP28L22 from the BATC since October 1984, please contact Members Services as soon as possible. (see News pages in this issue).

ORDERING INFORMATION

OVERSEAS MEMBERS should ask for a quotation of postage costs and acceptable forms of payment BEFORE ordering from Members Services. Please enclose an International Reply Coupon for reply.

PUBLICATIONS must be ordered SEPARATELY from the Publications Department on the form provided in this magazine.

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name	callsign
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Please order publications on the separate order form in this issue.

Items from these lists can only be supplied to current members of the BATC. These lists supercede all previous ones.
Please note that components for club projects are not available from Members Services unless contained within these lists.

Items marked thus: ** are available only until present stocks are exhausted.

Do components make you MAD?

A number of members seem to be having difficulty in obtaining certain parts for club projects and circuits, so in answer to the questions most asked we have compiled a list of suppliers which may help:

Economic Devices of P.O.Box 228, Telford, Shropshire TF2 8QP stock the SL1432, TBA520 and many other discrete semiconductors.

Post-A-Part Electronics of 6 Chapman Court, Charfleets Road, Canvey Island, Essex SS8 0PQ stock the TDA2540 and SW153A filter.

Technomatic Ltd of 17 Burnley Road, London NW10 1ED stock ZNA134J, NE564, NE592, MC1495L, LM711, RO-3-2513-UC plus 74.., 74LS.., and 74S series as well as most of the C-Mos series IC's. This firm also keep a comprehensive stock of general electronic parts.

Greatech Electronics Ltd of Hay Lane, Braintree, Essex CM7 6ST stock 2N3866, BFR90, BLX67 together with other thermionic and solid-state RF devices.

The first two firms advertise from time to time in "Television" and the second two in "Wireless World".

These firms are not necessarily the only or cheapest suppliers, but all will supply in small quantities or "one-off's". The information given is offered for guidance only and is believed to be correct at the time of printing. The BATC does not necessarily recommend any company and it is the members responsibility to check prices etc. before ordering.

THE THREE R'S.....

YOU ARE A READER

YOU MAY BE A WRITER

ARE YOU A RENEWER?

Yes it's that time again, time to raid the money box or extract that white fiver from your wallet, and watch the Monarch blink as his eyes peer at the unaccustomed light! The only time of the year when the Treasurer smiles as he sorts through the brochures for Mediterranean cruises.

Unless you have already paid in advance, you will find a membership renewal form tucked in this issue of CQ-TV. Please fill it in, not forgetting to check your mailing address on the envelope to make sure it is correct, and, together with a remittance of £5, send it to:- BATC Subscriptions, "Grenehurst", Pinewood Road, High Wycombe HP12 4DD, England.

ATV is getting larger, the BATC is becoming stronger, CQ-TV is getting larger.....what more can you ask for? RENEW NOW, don't take the risk of forgetting and losing out on all this; it's the best value you are likely to get in 1986!

Don't forget...

74S262 they must be wired in as detailed in Fig.1. A piece of Vero board or just a DIL socket could be usefully employed here.

Trevor has also had a number of enquiries asking how to use the caption writer with an E-PROM for fixed captions rather than the memory board. Fig.2 shows not only how to wire a 2716 for a single message but also shows how the system may be modified to enable 8 message pages to be accessed. This makes use of a decade switch and takes advantage of the memory capacity within the chip. The E-PROM is programmed with the required messages in ASCII.

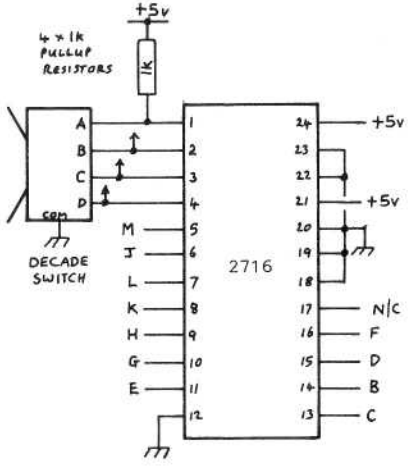
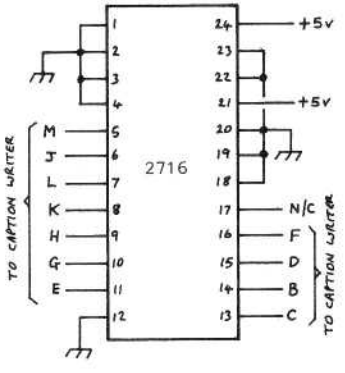


Fig.2 PAGED MESSAGE VERSION. (8 pages)



SINGLE MESSAGE

SOFT OPTION - The Revised ATV Handbook

Unfortunately Trevor has not yet found time to start on the PCB design (any volunteers for this kind of work would be VERY welcome - contact Trevor Brown G8CJS). A hand-made one turned up with a key bounce problem which was cured by adding a monostable delay to the strobe (see Fig.3). This modification also creates an auto-repeat when it times out - useful for clearing the screen. Just press the space keys and hold for a few seconds. The prototype is now on soak with me (Ed) and I find it most useful. PROM's are available from BATC Members Services.

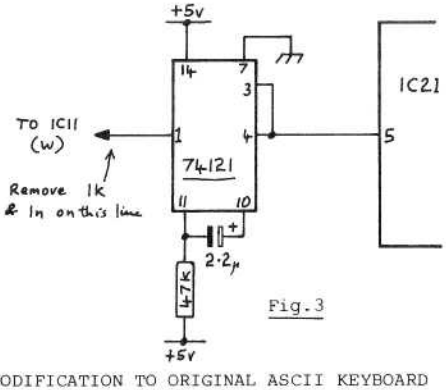


Fig.3

MODIFICATION TO ORIGINAL ASCII KEYBOARD CIRCUIT TO PREVENT KEY-BOUNCE.

CONTEST NEWS

By Mike Wooding G6IQM

Here I am suddenly up to my eyes in contest entries, surrounded by bits of 24cm receiver and the Editor sending test pictures from a new transmitter for GB3GV which he is fiddling with; however, as the computer is doing the sorting for me I had better get down to some pen pushing.

The 1985 Summerfun contest took place on a very warm sunny day (one of the only ones this year!) although the bands seem to have been somewhat flat. QSB was reported on 70 and in some cases poor talkback on 2m was experienced. I have no information regarding 3cm as only one station reported being QRV.

I have received the usual crop of complaints, some of which need airing: Neil G6CUQ reports local stations transmitting for long periods on 70; please remember, especially during contests, to keep vision transmission times to a minimum, this allows everyone in with a chance. Andy G4HJD bemoans the fact that P.W. had their 2m contest on the same day (so many contests - so little time), and that many DX'ers thought that all the activity on '750 was their contest! John G1GST wants certificates for BATC contest winners. Yes I agree, the matter is already in hand and is to be aired at the next committee meeting. Subject to approval it is hoped that certificates will be available for the start of the 1986 season. And finally; not a few of you complained that it was too hot! Pre-amps breaking down, PA's overheating and no sunglasses!

Many thanks to G1GST for the only receive-only entry and to all stations who took the trouble to enter. Congratulations to G6RAF - the overall winner, to G8DIR, the 70cm winner and to G6MBE for being first on 24cm.

RESULTS

70cm

POS'n	CALLSIGN	POINTS	LOCATION	BEST DX
1	G8DIR	3839	IO82RJ	G6CEZ/P
2	G8LIR/P	3785	IO83VQ	G1COI/P
3	G8MNY/P	3692	IO91MQ	G4DVN/P
4	G6RAF	2994	IO92QP	G1COI/P
5	G4CRJ	2878	IO91OO	GU8FBO
6	G4WRA/P	2768	IO92CA	G1COI/P
7	G1COI/P	2467	IO90VV	G8LIR/P
8	G8GLQ/P	1952	IO81WG	G6MNJ
9	G6CUQ	1750	IO92AG	G8GLQ
10	G6HMS	1258	IO93QE	G4DVN/P
11	G6CCV/P	1232	IO93RS	G4DVN/P
12	G6MPE	1201	IO90WT	GU8FBO
13	G6SKO	1149	IO93HB	G8DIR/P
14	G1GST	1130	IO82WM	G8LIR/P
15	G6CEZ/P	1072	IO81JD	G8DIR/P
16	G4VID	822	IO91XJ	G6RAF
17	G1BTF	527	JO81DN	G8MNY/P

24cm

POS'n	CALLSIGN	POINTS	LOCATION	BEST DX
1	G6MPE	1968	IO90WT	G1DSO
2	G6RAF	1172	IO92QP	G4DVN/P
3	G4CRJ	936	IO9100	G4WHO
4	G4VTD	456	IO91XJ	G4CRJ
5	G1COI/P	412	IO90VV	G4WTV
6	G4JQP	96	IO81SF	G4GLQ/P
7	G4GLQ/P	66	IO81WG	G4ZQF

COMBINED SCORES

1	G6RAF	4166
2	G8DIR	3839
3	G4CRJ	3814
4	G8LIR/P	3785
5	G8MNY/P	3692
6	G6MPE	3168

1986 WINTER CUMULATIVES

Once again, and in all BATC UK contests in future, SSTV is to be included as also is 3cm, so let's have a little more activity please or at least reports of attempted contacts. Multi-operator stations must use one call sign only and the same station may only be contacted once per session to count for points. Log sheets - available from me - are preferred, and a separate sheet is required for each leg please.

DATES

Thursday January 9th
Friday January 17th
Saturday 25th January
Sunday 2nd February

TIMES

1900 - 2400Hrs local time each day

BANDS

Fast-Scan on 70, 24 and 3cm - Slow-Scan on 2m. Separate entries for each band please.

EXCHANGES

A four digit code group (ie 4247), which may be changed each session and should be different for each band on any one night, should be sent by vision only.

Call, Maidenhead locator, report and serial number (to commence with 001 each session and each band) may be exchanged by either vision or phone.

TRANSMITTING AMATEURS who can receive vision only should enter the receive section and claim as for a one-way contact for each correctly identified TV station.

SHORT WAVE LISTENERS may also enter the receive only section but cannot 'give' points to other stations.

SCORING

A maximum of any three sessions will count towards an entry but please submit a checklog for the fourth if worked.

2-way contact on 70cm, 24cm, 3cm and SSTV:- 2 points per Km.

One-way only contacts score half points for each station.

LOGS

Must include your postal address, Maidenhead locator, code group used in each session and band, date of sessions, claimed scores for each band and session plus brief station details. Entries must be received no later than April 1st 1986. Comments or suggestions on the contest are always welcome as are your stories and humorous anecdotes.

Please remember to QSY from the calling channels as soon as a contact has been established, and please keep your vision transmissions to an absolute minimum duration.

Supplies of contest log and cover sheets - for use in ALL BATC contests - are available on receipt of a large (A4 - 12" x 8.5") stamped addressed envelope from; Mike Wooding G6IQM, 3 Perkins Grove, Rugby, Warks CV21 4HU. ALL contest entries and any other contest correspondence should also use this address please.

DATE FOR YOUR DIARY

A new 70cm ONLY 'whole-day' contest the "APRIL FOOLS FIESTA" is to take place on April 1st 1986 from 0001Hrs to 2359Hrs local time. BATC general contest rules apply and logs should be in by April 30th. Worth taking the day off for?

Fiftieth Anniversary of the Last BBC 30-Line T.V. Broadcast

On the 11th of September 1935 the low definition TV service of the BBC came to an end after 1,500 programmes.

To celebrate this event, Doug Pitt and Jeremy Jago, of the Narrow Bandwidth Television Association, are producing a special magnetic recording of 30-line TV signals. A limited number of copies will be made available in due course.

If you know of anyone owning a FUNCTIONING 30-line receiver (commercial or home-made) who may be interested, please send details to: D.B.Pitt. 1 Burnwood Drive, Wollaton, Nottingham NG8 2DJ. Tel: 282896

A MECHANICAL CAMERA

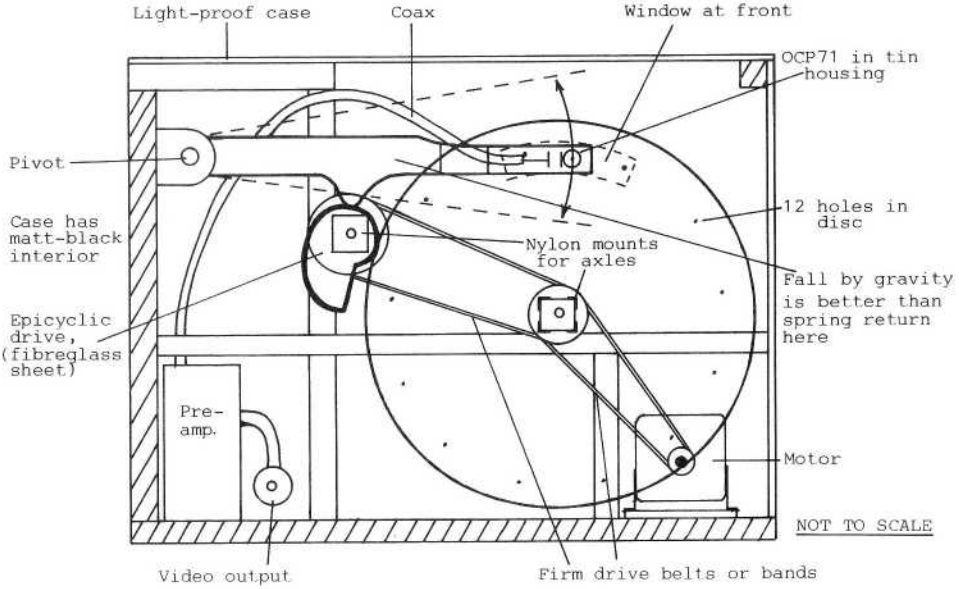
By Alan Short

In CQ-TV 130, in an article by Doug Pitt, my system of producing 96-line pictures using a Nipkow disc was reported. Mechanical systems have always fascinated me, and recently I have discovered a new workable system which may not have been seen before.

This system enables easy changing to any number of lines, i.e. 32 for normal N.B.T.V. or up to 128 or more for slow scan: It is particularly suitable for SSTV captions which is the main reason for this article appearing in CQ-TV.

Construction is simple and it can outstrip the Nipkow disc for detailed pictures. It is also reasonably compact and is cheap to produce. The diagram shows, in a matt-blackened light-proof box, a disc with twelve concentric holes driven by a motor and pulleys. From the disc axle, pulleys and a band drive a spiral-shape mounted on a second axle which in turn moves an arm, pivoted at one end, thus giving the necessary movement for frame scan. At the tip of the arm is mounted an OCP71 photo-cell which, with its spot sensitivity, passing across and behind the disc holes, gives sequential scanning. A co-axial cable earths the photo-electric cell housing, which has a window at the front, and carries the video signal to the pre-amplifier. The disc holes need to be about 1.5mm in diameter and the disc at least 10cm diameter to give a readable caption or portrait. Larger discs give proportionally more detail etc. Changing pulley sizes gives a great variety of lines and frame speeds and the use of Meccano parts makes this easy.

I found my camera worth building and the results amazingly good, though in this simple form, a little noisy at over 8 frames per second.



AXLES & PULLEYS - MECCANO

NEW TELETRON VDU

By Trevor Brown G8CJS

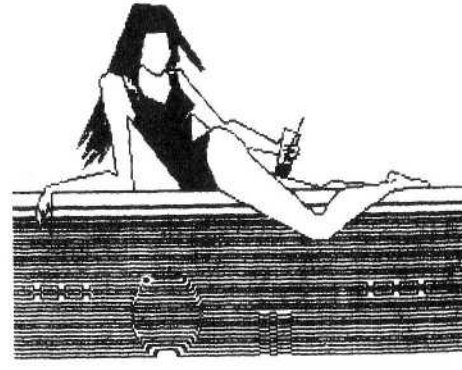
This article is concerned with both the TELETRON and TELETRON VDU projects in my latest book 'Micro and Television Projects', and reference should be made to the original for full details.

Teletron is a small, TV orientated micro which uses just five IC's for the basic card. It features 2k of on-board RAM and the program is resident in a single PROM (2716, 2732, 2764 or even 27128). 24 I/O lines are provided by an 8255 PIO - just the job for controlling a TV repeater - and a printed circuit board is available from Members Services. I have not yet been inundated with software listings but I am sure there are many of you who can write Z80 code. I am looking for a volunteer to write the first PROM and help get this very useful television building block moving.

TELETRON VDU

The VDU which accompanies Teletron has now been re-designed to improve its flexibility. Fig.1 shows the new circuit (it replaces the one on page 79 of the Handbook) which is bit-mapped, ie, the computer can access each individual pixel, the screen being 128 x 128 pixels. The character font ROM is replaced by character font information in the program ROM. When a character is printed an 8 x 16 dot pattern is moved up onto the screen for each character. The format of 16 characters per line is unchanged and a total text of 8-lines, one being in the vertical interval and not used for text, but reserved for creating vertical interval data. This flexibility means that the programer can now create graphics and custom fonts and even animated characters, because the hardware barrier has been removed.

The memory map changes as the spare screen memory is taken up by the more powerful VDU. The new memory map reserves up to 32, 767 or 7FFF in hex for PROMS, the remaining memory being divided into 4 pages of 8k. The top page is where the new VDU resides; above 57344 or E000 hex. The bottom page, which starts at 32, 768 or 8000 hex, is where the RAM on the Teletron card is located (6116 for the time being). This leaves two spare pages, and the chip enables are Ram-1 and RAM-2 on the VDU card. These pages are as yet not filled with RAM but do mean that the system can be expanded to include more later. The new map still works with a bare Teletron board without VDU, provided the link connecting pin-18 of the RAM chip to pin-8 of the 74LS04 (on the Teletron board) is made. Pin 18 of the 6116 is re-routed to pin 14 of IC1 on the VDU when the VDU is fitted (remove link). The new map is as follows:-



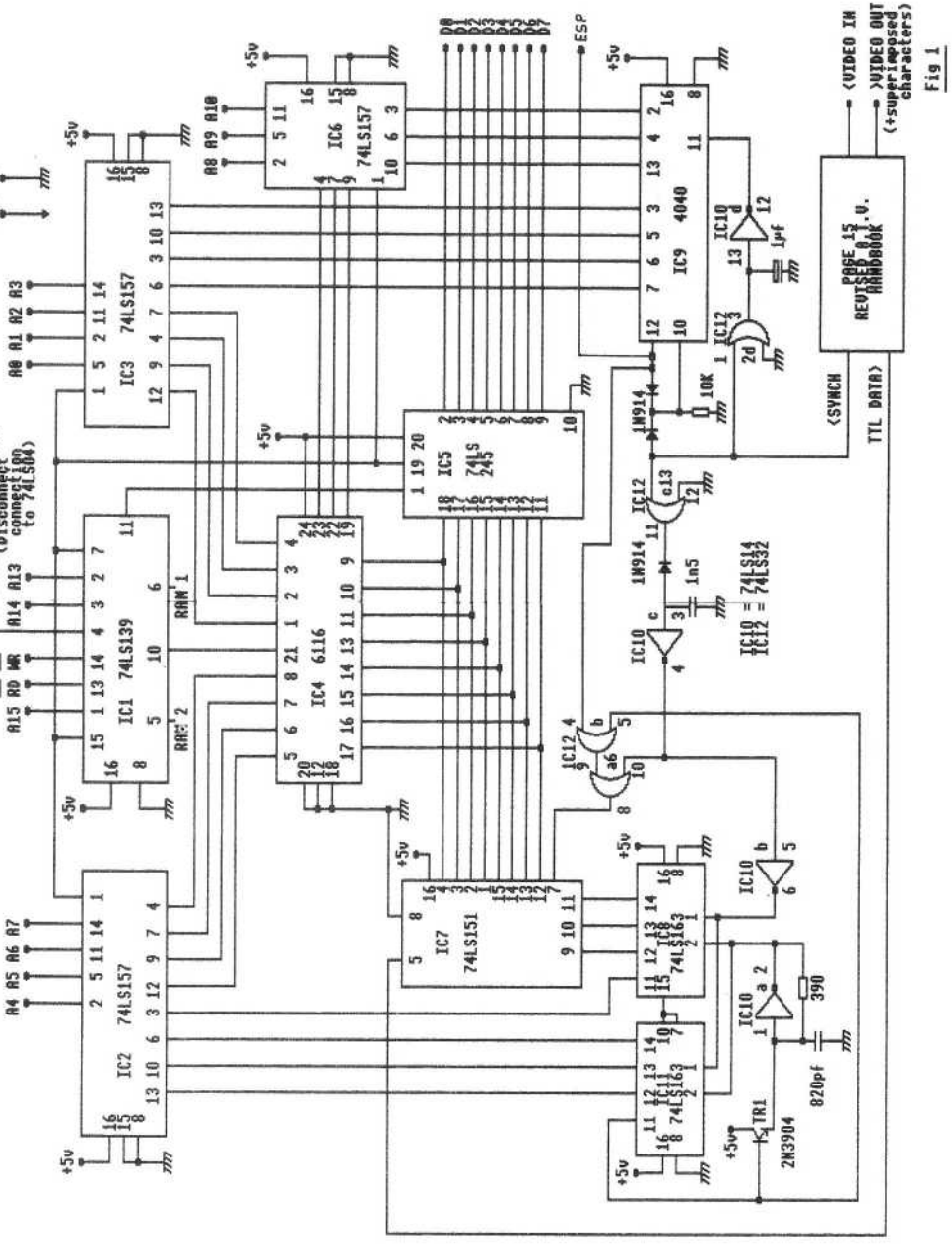

IC1 74LS139
IC2 74LS157
IC3 74LS157
IC4 6116
IC5 74LS 245
IC6 74LS157
IC7 74LS151
IC8 74LS163
IC9 4040
IC10 a
IC10 b
IC10 c
IC12 a6
IC12 b
IC12 c13
IC12 2d
1N914
1n5
10K
1pf
390
820pf
2N3904
TR1
RAM 1
RAM 2
+5v
0v
ESP
A0 A1 A2 A3
A4 A5 A6 A7
A8 A9 A10
A12 A13 A14
A15 RD WR
D0 D1 D2 D3 D4 D5 D6 D7
To Pin 18 TELETROM RAM (disconnect connection to 74LS04)
PAGE 15 REVISED O.U.V. HANDBOOK
(SYNCH
TTL DATA)
(VIDEO IN
)VIDEO OUT (+superimposed characters)
IC10 = 74LS14
IC12 = 74LS32

Fig 1

	65535		FFFF	
TELETRON VDU		SCREEN		
	57344		E000	
NOT FITTED AT PRESENT		RAM-1		
	49152		C000	
NOT FITTED AT PRESENT		RAM-2		
	40960		A000	
EXISTING RAM ON MAIN TELETRON BOARD		RAM		87FF RAM TOP
	32768		8000	
	32767		7FFF	TOP OF 27256
	16383		3FFF	TOP OF 27128
PROM AREA				
	8191		1FFF	TOP OF 2764
	4095		0FFF	TOP OF 2732
	2047		07FF	TOP OF 2716
	0000		0000	
	DECIMAL		HEX	

The VDU is locked to a video or mixed sync signal and is equipped with a video superimposition port. The PCB will not now be a piggy-back but rather a separate module. It still requires connecting to the pads provided in the middle of the Teletron PCB however, and not to the edge connector. The best way to do this is to use a DIN 41612 double 32-way edge connector, the bottom row routing to the PCB in the normal way and the top row being cut short and routed to the pads via a small wiring harness. In this way all the necessary connections are available at the edge connector. The VDU uses A10, A13, A14 and A15 which are not on the pads. Spare pads S1, S2, S3 and S4 should be wired under the board to pins 5,4,3 and 40 of the Z80 to create the necessary pads.

VDU SOFTWARE

Screen RAM is organised so that the 16 data words which make up each character are adjacent to each other in program memory, and, when moved to screen memory, are separated by 16 locations.. In this way they appear on the screen as 16 words, one above the other, ie; a 1-word by 16 matrix or an 8 x 16 matrix. To move a character onto the screen load HL with the address of the first byte of the character font, load BC with 10 hex (16 decimal) and load DE with the screen address of the required character position. LDIR will then move the character onto the screen. The address of the first character is E100, the second being located at E110. E000 to E1FF is in picture blanking and is for creating vertical interval data.

THE P.I.O.

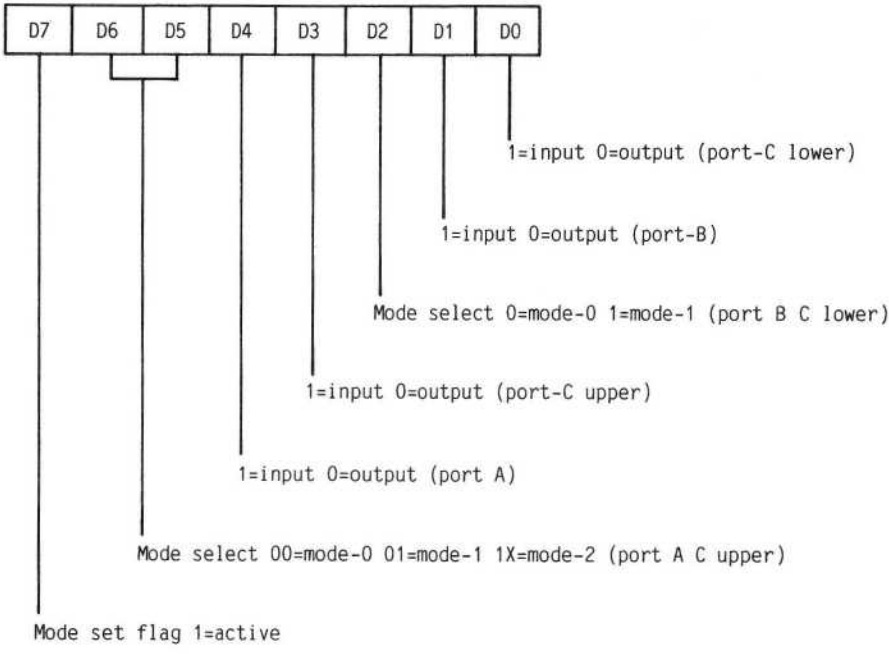
The 8255 PIO was not covered in depth in the book text. This is a very complex chip which merits a book on its own - indeed there is one on the market. If we stick to mode-0, ie latched output ports and non-latched inputs, then Fig.2 shows how one can arrive at a single 8-bit word necessary to initialise the port. The word should be outputted to the control register and an example word could be 82 in hex, this would set the A and C ports to outputs and the B port to an input.

1.0.0.0.0.0.1.0

eg; 82 HEX

A word of warning now to software writers; the PIO takes longer to recover from the initial power-on reset than does the Z80, so do not make PIO initialisation the first instruction, leave this until a little later on in the program, after the PIO has setled down.

8255 CONTROL WORD



	A1	A0
Port A	0	0
Port B	0	1
Port C	1	0
CONTROL REGISTER	1	1

Fig.2

E.S.P.

When the micro writes to the screen it takes posession of both the screen RAM address and data bus leaving the screen without any memory, this causes momentary disruptions to the picture which are rather annoying. If text line one is used to create vertical interval data, then these disruptions could cause data errors. The answer to this problem is E.S.P. (End of Screen Pulse). By writing to the screen only during the 56 lines existing between the last line of text and the vertical interval, the problem is eliminated. This period is signalled by a high on the end of the screen pulse. The micro should check via the PIO for the start of this pulse by initially finding a low and then re-checking until a high is found; the screen may then be updated without fear of disturbance for 3.5 mS; a time period which should be sufficient to update the whole screen if necessary.

NEW GOODIES FROM W&D

Since the last CQ-TV appeared the team from Aldermaston have released three new modules which should appeal.

They are:

TVSG, a sound sub-carrier generator for transmitters,

FIF1, an audio board for the VIDIF, and

VP/D1, a video pre-emphasis or de-emphasis module for use in transmitters and receivers.

Although intended for use with other W&D products, they can of course be adapted for other uses.

The two audio boards are available in both 5.5 and 6.0 MHz versions (how sensible). The transmitter one is inserted in the video line feeding the power oscillator (or other transmitter) in use, while the receiver unit connects direct to the VIDIF (and other similar demodulators) and provides a partially squelched loudspeaker output as well as a 600-ohm line output for your VCR, hifi system or whatever! The pre/de-emphasis board can be used in either configuration by connecting the appropriate links and follows the CCIR curves published in the last issue of CQ-TV. All three items are sold as assembled boards and operate on a nominal 12V or 13.8V.

I have added samples of the sound and de-emphasis boards to my receiver, and I am very pleased with both. The squelch is not 100 per cent, but mutes 'inter-station' hiss to a low level. Volume control is an on-board preset: you might like to bring this outside to the front panel. The de-emphasis makes a considerable improvement (assuming the transmitted signal has correct pre-emphasis) and has enabled me to see fine detail previously unreadable. Highly recommended!

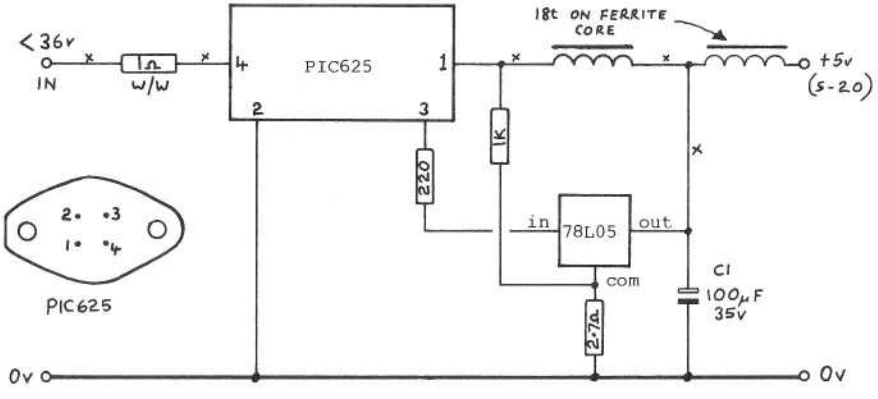
Price of the audio board is £11.75 the transmit sound modulator £8 and the emphasis board £4.75. A 24 cm preamplifier is also promised soon.

(G8PTH).

A SWITCH MODE PSU

By Clifford Brownbridge G6BIN

Switch mode power supplies all use some kind of oscillator to achieve greater efficiency, some even put the oscillator ahead of the mains transformer in order to use the smaller high frequency transformers. This design uses a standard mains transformer but does achieve a very high degree of efficiency. The heart of the circuit is a special i/c - the PIC625.



SWITCH MODE POWER SUPPLY CIRCUIT

The external circuitry is not very critical although short, thick cable must be used on paths indicated on the circuit with an "x". C1 should not be a tantalum component as they often object to a high frequency charge and discharge. The output voltage is set by the 78L05 regulator but the circuit is not limited by the current handling of this device, a 78L12 should be used for a 12v power supply etc. The typical output range for this type of circuit is around 5 - 20v. The circuit is about 75% efficient, that is, for a mains transformer having a 30v secondary rated at 2Amps (60VA) then 5 volts at 5A can be realised or 12v at 3A. 5v at 5A = 25Watts, much less than 75% of 60VA, and 12v at 3A = 36Watts, again less than 75% of the transformer's VA rating. In order to stay within limits:-

1. Do not exceed 75% of the mains transformer's VA.
2. Do not draw more than 5A from the PIC625 or drive it with more than 36v.
3. Do not short circuit the output. The circuit is not short circuit proof, although the inclusion of a low value resistor in series with the input attempts to make it so, and the PIC625 may be destroyed.
4. If the output IS shorted then power down before removing the short as this is when the damage occurs. Remember that the circuit oscillates and a good metal box will help to reduce radiation.

The PIC625 is available from: Thame Components, Thame Park Road, Thame, Oxon OX9 3XD.

A CHEAP AERIAL FOR 1.3

By Godfrey Spires B.Eng. G4XHM

The following article is re-printed from the Cambridgeshire Repeater Group Newsletter No.7, with grateful thanks to the Editor G4HCL and the author.

Now that 24cm ATV is catching-on in the Cambridge area and, not wishing to spend a lot of money on aerials, I began to look for cheaper alternatives. being an active 70cm ATV'er with increasing interest for 24cm FM-TV I ideally wanted a cheap, wideband aerial which wasn't going to hurt my pocket. My thoughts strayed towards commercial broadcast TV aerials.

I thought that if a C/D group aerial works over the frequency range of 680MHz to 860MHz then it must be feasable to scale the aerial to work between 1240MHz and 1325MHz. Simple calculations showed that the C/D group aerial must be scaled in size by 0.6 to optimise the aerial for the middle of the 23cm band. The factor was obtained by dividing the middle of the TV band, namely 770MHz, by the middle of the 23cm band, namely 1282.5MHz.

The aerial was purchased from a local TV wholesale shop for £5 and measurements were taken and recalculated. The element lengths were trimmed to the new lengths and the spacings between elements were also adjusted. The element widths were not altered.

ELEMENT	C/D GROUP AERIAL	AERIAL FOR 23/24cm
Reflector	75 x 265mm	45 x 159mm
I/D Dipole	167 x 30mm	100 x 18mm
1st director	158mm	95mm
2nd director	158	95
3rd director	158	95
4th director	158	95
5th director	158	95
6th director	158	95
7th director	151	90.5
8th director	151	90.5
9th director	151	90.5
10th director	151	90.5
11th director	151	90.5
12th director	145	87
13th director	145	87
14th director	145	87
15th director	145	87
Radiator/radiator spacing	75.5	45
1st rad./2nd rad. spacing	68	41
1st rad./dipole spacing	30	18
Dipole/reflector spacing	85	51

The dipole on the original aerial was not used, but rather remade from 0.25" diameter copper wire so that the coax could be soldered directly to the dipole. The fact that the original aerial was matched for a 75-ohm system was of no importance as this represents a VSWR of 1,5 which is acceptable in a 50-ohm system.

Once the aerial was completed it was checked against a known working 6-element beam. Initial tests showed promise. The following day, extensive tests were carried out using accurate measurement equipment.

RESULTS

The gain was greater than 11dBd (dBd = dB relative to a dipole) over the 1240 - 1325MHz region, dropping to 10dBd at 1200 and 1350MHz, and peaking to 12dBd at 1280MHz. The VSWR was less than 1.4 over the whole band, measured at 50-ohms impedance.

So with a £5 aerial and about one hour of cutting and drilling, a wideband aerial can easily be built, saving many pounds over commercially available aerials. For the keen amateur it is quite possible to phase four such aerials together, using the G4XHM splitter design to obtain an aerial gain of around 16dBd over the whole band.

SOFTWARE NOTEBOOK

5 - VTR CLOCK BBC-B

By Chris Cooper
& Dave Lawton GØANO

Be like the professionals, put a VT clock on the front of your tapes, or use it on the air to announce items about to be transmitted. This clock, written for the BBC model-B micro, is in fact used in a commercial VT scanner.

The red function keys control the clock as follows:-

f0 - Runs the clock to zero or stops it.
f1 - Runs the clock - the screen goes black at 3-seconds.
f2 - Sets the clock to 20-seconds.
f3 - Sets the clock to 30-seconds.
f4 - Sets the clock to 40-seconds.
f5 - Sets the clock to 45-seconds.
f6 - Sets the clock to 60-seconds.
f7 - Clears the text area.

The cursor keys allow movement around the text (top half of the screen) area and your own callsign and locator may be inserted at line 130 of the program. The underline character is the one on the £ key. The clock will reset itself a few seconds after the screen blacks out.

The program was written to run from disc, however it will also work in a tape system. Anyone who would like a copy, ON DISC ONLY, is invited to send a formatted disc, together with stamped addressed return packaging to Dave Lawton, "Grenehurst", Pinewood Road, High Wycombe, HP12 4DD.

```
 10 REM Written by Chris Cooper
 20 REM Modified by Dave Lawton
 30 ON ERROR GOTO 1720
 40 @%=2
 50 *FX4,1
 60 *FX225,128
 70 VDU 23,130,255,0,255,0,
    255,0,255,0
 80 radius=350
 90 START%=45
100 DIM X%(60),Y%(60) ,CHAR% 9
110 MODE1
120 CLR3=0
130 NAME$=" CALLSIGN ":TEL$=
    " LOCATOR "
140 DATA0,0,"Title:",0,4,"Date:
    ",0,8,"Spool No.:"
150 DATA 7,0,""
160 BACK=0:CLOCK=1:HAND=2:
    BOTH=3
170 GCOL 0,CLOCK
180 CLG
190 VDU 19,CLOCK,7,0,0,0,
200 VDU19,HAND,7,0,0,0,19,BOTH,
    7,0,0,0
210 FOR ANGLE=60 TO 0 STEP -1
220 X%(ANGLE)=radius*SIN
    (RAD((60-ANGLE)*6))
230 Y%(ANGLE)=radius*COS
    (RAD((60-ANGLE)*6))
240 NEXT
250 VDU5
260 VDU 29,radius+135;
    1023-radius-80;
270 MOVE radius,0
280 FOR ANGLE=45 TO 3 STEP -1
290 DRAW X%(ANGLE),Y%(ANGLE)
300 IF (ANGLE MOD 5 =0) OR
    (ANGLE<=10) THEN PROC_SECOND
    _MARK
310 NEXT
320 MOVE -1.3*radius,-1.2
    *radius
330 PROC_LOGO
340 VDU4
350 PRINTTAB(20,27);:PROC_DOUBLE
    (NAME$)
360 PRINT TAB(20,29);:
    PROC_DOUBLE (TEL$)
370 PRINT TAB(5,0);:PROC_DOUBLE
    ("F A D E")
380 IDENT$="IDENT"
390 FOR I%=1 TO LEN(IDENT$)
400 PRINTTAB(0,4+3*I%);:PROC_
    DOUBLE (MID$(IDENT$,I%,1))
410 NEXT
420 PROC_WINDOW(1)
430 CLS
440 PROC_TITLES
450 S%=START%
460 REPEAT
470 GCOL 3,2
480 PROC_HAND
490 REPEAT
500 A=GET
510 IF A=13 THEN A=&8A :VDU13
520 IF A=127 THEN A=&88:VDU8:
    PROC_DOUBLE(" ")
530 IF A=&81 THEN CLR3=1
540 IF A=&82 THEN PROC_HAND:
    S%=20:PROC_HAND
550 IF A=&83 THEN PROC_HAND:
    S%=30:PROC_HAND
560 IF A=&84 THEN PROC_HAND:
    S%=40:PROC_HAND
570 IF A=&85 THEN PROC_HAND:
    S%=45:PROC_HAND
580 IF A=&86 THEN PROC_HAND:
    S%=60:PROC_HAND
590 IF A=&87 THEN CLS:
    PROC_TITLES
600 IF (A=&8B) AND (VPOS>1) THEN
    PRINTTAB(POS,VPOS-2);
610 IF (A=&8A) AND (VPOS<9) THEN
    PRINTTAB(POS,VPOS+2);
620 IF (A=&88) AND ((POS<>0) OR
    (VPOS<>0)) THEN VDU8
630 IF (A=&89) AND ((POS<>23) OR
    (VPOS<>9)) THEN VDU9
640 IF A<&80 THEN PROC_DOUBLE
    (CHR$(A))
650 IF (VPOS MOD 2)=1 THEN PRINT
    CHR$10;
660 IF VPOS>=11 THEN PRINT
    TAB(POS,10);
670 UNTIL A=&80 OR A=&81
680 VDU7,23,1,0;0;0;0;
690 START%=S%
700 TIME=1
710 REPEAT
720 REPEAT UNTIL TIME MOD
    100 =0
730 PROC_SECOND_HAND
740 IF S%=10 THEN VDU19,BACK,
    7,0,0,0:A%=INKEY(4):VDU19,
    BACK,0,0,0,0
750 IF S%=3 AND CLR3=1THEN
    VDU19,1,0;0;19,2,0;0;
    19,3,0;0;
760 PROC_BIG
770 A=INKEY(0)
780 UNTIL (S%=0) OR (A=&80)
```

```
 790 IF CLR3=1 THEN A%=INKEY
     (300):VDU19,1,7;0;19,2,7;0;
     19,3,7;0;:CLR3=0
 800 PROC_WINDOW(2)
 810 CLS
 820 PROC_WINDOW(1)
 830 VDU7,23,1,1;0;0;0;
 840 A=INKEY(300)
 850 PROC_HAND
 860 S%=START%
 870 UNTIL FALSE
 880 DEF PROC_SECOND_MARK
 890 IF ANGLE MOD 5<>0 THEN
     PROC_MARK(0.95) ELSE
     PROC_MARK(0.9):PROC_DIGIT
 900 ENDPROC
 910 DEF PROC_MARK(F)
 920 IF ANGLE=3 THEN MOVE
     1.1*X%(ANGLE),1.1*Y%(ANGLE)
 930 DRAW F*X%(ANGLE),F*Y%(ANGLE)
 940 MOVE X%(ANGLE),Y%(ANGLE)
 950 ENDPROC
 960 DEF PROC_DIGIT
 970 LOCAL X%,Y%
 980 X%=X%(ANGLE):Y%=Y%(ANGLE)
 990 MOVE 1.15*X%-30,1.1*Y%+10
1000 PRINT ANGLE;
1010 MOVE X%,Y%
1020 ENDPROC
1030 DEF PROC_SECOND_HAND
1040 PROC_HAND
1050 S%=S%-1
1060 PROC_HAND
1070 ENDPROC
1080 DEF PROC_HAND
1090 MOVE 0,0
1100 PLOT 5,X%(S%),Y%(S%)
1110 ENDPROC
1120 DEF PROC_LOGO
1130 GCOL 0,HAND
1140 PLOT 0,0,20
1150 PLOT 0,100,160
1160 PLOT 81,100,-160
1170 PLOT 0,-100,-160
1180 PLOT 81,-100,160
1190 GCOL0,BACK
1200 PLOT 0,88,108
1210 VDU66,10,10,8,65,10,10,8,
     84,10,10,8,67
1220 ENDPROC
1230 DEF PROC_TITLES
1240 LOCAL X%,Y%,T$
1250 RESTORE
1260 REPEAT
1270 READ X%,Y%,T$
1280 PRINT TAB(X%,Y%);:
     PROC_DOUBLE(T$)
1290 UNTIL LEN(T$)=0
1300 ENDPROC
1310 DEF PROC_DOUBLE(A$)
1320 LOCAL I%,A%,X%,Y%
1330 IF A$="" THEN ENDPROC
1340 A%=10:X%=CHAR%MOD 256:
     Y%=CHAR% DIV 256
1350 FOR I%=1 TO LEN(A$)
1360 CHAR%?0=ASC(MID$(A$,I%,1))
1370 IF CHAR%?0 <&20 THEN
     PROC_CONTROL(CHR$(CHAR%?0)):
     NEXT:ENDPROC
1380 CALL &FFF1
1390 VDU 23,128
1400 FOR Z%=1 TO 4
1410 VDU CHAR%?Z%,CHAR%?Z%
1420 NEXT
1430 VDU 23,129
1440 FOR Z%=5 TO 8
1450 VDU CHAR%?Z%,CHAR%?Z%
1460 NEXT
1470 PRINT CHR$128;CHR$8;CHR$10;
     CHR$129;CHR$11;
1480 NEXT
1490 ENDPROC
1500 DEF PROC_CONTROL(A$)
1510 ENDPROC
1520 DEF PROC_WINDOW(X)
1530 IF X=1 THEN VDU28,16,12,39,0:
     PRINT TAB(7,0);: ELSE VDU
     28,30,25,37,17
1540 ENDPROC
1550 DEF PROC_BIG
1560 LOCAL X%,Y%,A%
1570 PROC_WINDOW(2)
1580 CLS
1590 IF S%>9 THEN PROC_WINDOW(1):
     ENDPROC
1600 A%=10:X%=CHAR% MOD 256:
     Y%=CHAR% DIV 256
1610 CHAR%?0=&30+S%
1620 CALL &FFF1
1630 FOR ROW%=1 TO 8
1640 MASK%=&80
1650 FOR COL%=1 TO 8
1660 IF (CHAR%?ROW% AND MASK%)=0
     THEN PRINT " "; ELSE PRINT
     CHR$130;
1670 MASK%=MASK% DIV 2
1680 NEXT
1690 NEXT
1700 PROC_WINDOW(1)
1710 ENDPROC
1720 MODE7
1730 REPORT
1740 PRINT " at Line ";ERL
1750 *FX4,0
```

Grateful thanks to Chris Cooper for permission to publish this program..

CAD

A CUSTOM-DESIGNED FM-TV VIDEO STRIP

By John Goode &
John Wood G3YQC

Having now had some considerable experience of various FM-TV demodulator strips, including some commercially built ones, it has become apparent that in many cases the baseband video processing circuitry leaves something to be desired. Problems range from poor syncs, poor HF response - often impairing colour performance, poor filtering - allowing excessive noise onto the screen and a basic inability to handle the widely varying levels of recovered video from the demodulator itself. This latter problem is particularly relevant in amateur circles, since stations can vary considerably in the amount of frequency deviation used in their vision transmissions. Since the amplitude of recovered video is directly proportional to the signal deviation one can readily appreciate why such changes can occur. If a video amplifier is unable to handle these higher level signals then the most probable effect is either white or sync crushing, neither of which is exactly desirable!

Now that there are so many of us working with FM-TV, including satellite TV enthusiasts, it seems an appropriate time to publish a new circuit, which has been custom designed for CQ-TV and intended to follow FM demodulators. It has in fact been specifically designed to follow the ubiquitous NE564 PLL although little or no modification to the input circuit should be necessary to enable it to follow other circuits.

DESIGN SPECIFICATION

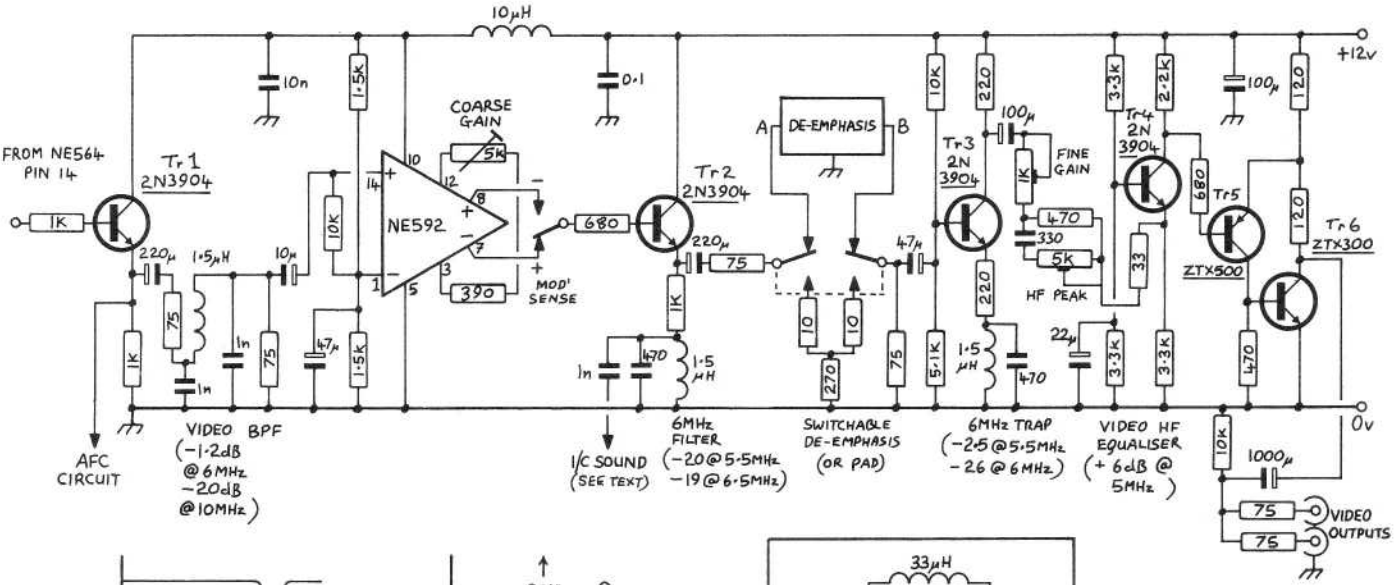
A basic specification, detailing the required facilities, was first drawn up by myself (G3YQC) and this was then sent to John Goode for the actual design work. The original design requirements are listed below:-

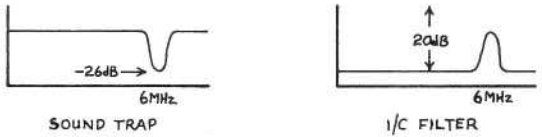
1. An AFC output should be available.
2. A video filter is required.
3. Positive or nagative modulation capability.
4. Sound takeoff point.
5. Switcheable CCIR de-emphasis.
6. Sound trap in the vision circuitry.
7. Wide range video gain control.
8. High frequency peaking or lift after de-emphasis.
9. Two independent video outputs each providing 1v p-p across 75-ohms.

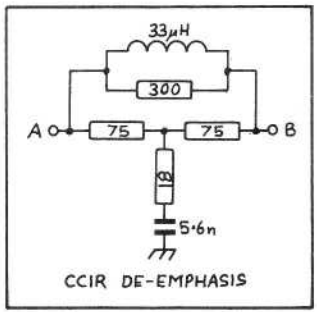
THE CIRCUIT

The final circuit is illustrated in Fig.1, with a suitable CCIR de-emphasis circuit inset in the box. Sketches of the various filter responses are also shown for interest.

For possibly the first time in a design made especially for CQ-TV the various filter circuits have been designed using a computer. Such computer analysis not only makes the design work more accurate but also eliminates the need to







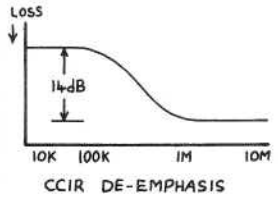


Fig.1 VIDEO STRIP FOR FM-TV RECEIVER.

try them on the bench first before including them in a finished design. In practice the calculated responses agree very closely with those measured using sweep equipment.

Video from the demodulator (pin 14 - NE564) is applied to the base of Tr1, an emitter follower, via a 1k matching resistor. An AFC signal is taken directly from the emitter of this stage and may be used to drive an AFC circuit such as that used in the Wood & Douglas receiver and others. Video from Tr1 is passed through a video filter to remove high frequency noise and on to an NE592 i/c. The use of an i/c here seemed an appropriate way of coping adequately with the potentialy wide range of video amplitudes as well as providing convenient mod' sense switching. The gain pot. may be considered as a 'coarse' control having a variable voltage gain of between around 1.3 and 15. It may be of interest here to show a table of voltage gain versus gain set resistance (between pins 3 & 12) from measurements taken during the research for this unit:

R between pins 3-12	GAIN
6k8	1.0
4k7	1.5
3k3	2.125
1k	6.25
680R	9.0
560R	10.0
470R	12.5
220R	21.5
150R	27.3
100R	33.3
12R	50.0

It should be noted that measurements were not made with the uA733 version which may differ slightly in performance.

The output from the NE592 amplifier passes to another emitter follower stage (Tr2) from which the sound is extracted. A sound filter is provided at this point, shown in the diagram for 6MHz, although other values may be used for different standards, (more on that later). Intercarrier sound takeoff should be fed to an input impedance greater than 10k-ohm to prevent undue damping of the tuned circuit in Tr2 emitter. The circuit shown in Fig.3 will allow connection to a lower impedance sound demodulator input.

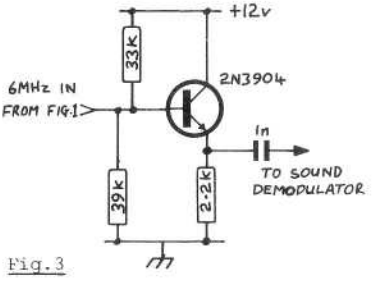


Fig.3

Video is matched into 75-ohms in order to correctly terminate the de-emphasis network, this being switched either in or out of circuit as required. If the network is switched out of circuit then a 'T' pad resistive attenuator, having a similar attenuation to the de-emphasis network (about 3dB), is provided in order to equalise the through-video and eliminate the need to adjust the monitor's contrast control.

Tr3 amplifies the resulting video signal and provides a sound trap at its emitter. The following R/C network provides a 'fine gain' control as well as introducing a measure of HF equalisation. This was thought desirable as it

may prove useful in lifting the colour information which may have been somewhat reduced during transmission. The signal from Tr4 is applied to an output pair which is capable of delivering a 1v p-p composite video signal from both outputs simultaneously.

FURTHER CONSIDERATIONS

Some stations may not be using a standard pre-emphasis circuit in their transmitters, therefore a receiver would normally be set for a 'flat-band' response. Nevertheless it may still be advantageous to provide a general degree of high frequency enhancement at the receiver in order to partially compensate for possible non-linearity or bandwidth restriction in the transmission path. Fig.2 shows a circuit which provides either standard CCIR recommended de-emphasis or a lift of +6dB at 5MHz. This circuit may be wired into the main unit in place of the de-emphasis network shown.

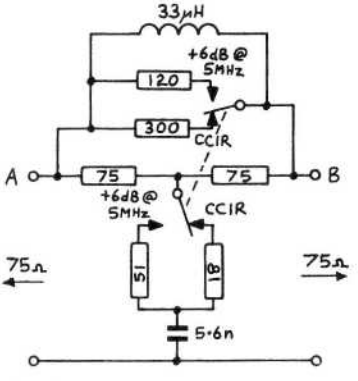


Fig.2 CCIR de-emphasis. Switched to allow +6dB at 5MHz if required.

There is virtually no alignment to be carried out, only the setting of the two gain controls: The fine gain control should be set to mid-position and, whilst receiving a 'typical' FM-TV signal, the coarse gain should be set to give 1v p-p composite video across a 75-ohm termination, measured with an oscilloscope at the video strip's output. Small adjustments to the video level should then only be carried out using the fine gain control.

COMPONENTS AND CONSTRUCTION

There are no special components in this design. The fixed inductors may be from the Toko range available from Bonex Ltd or Cirkit. The de-emphasis circuitry is best switched using miniature relays in order to keep lead lengths short. The 'fine gain' control may also be panel mounted if required although, since it is signal-carrying, short leads should be used here as well.

Construction of the prototypes have been on PC boards (no layout available at present) but careful construction on Vero board should be OK. If an existing demodulator is being used the lead from pin 14 should be as short as practical to avoid any stray pickup. To alter both the sound trap and filter to 5.5MHz operation the 470pF capacitor should be increased to 560pF in each case.

RESULTS

Prototypes have shown a noticeable improvement in video quality over many of the circuits published so far. Video or sync distortion does not take place even when the output voltage is much larger than 1v. The wide range of video gain control ensures that most signals - even those from satellites with their wide deviations - can be handled with ease. The colour performance is excellent and the various facilities make it a very useful and worthwhile project for the discerning amateur.

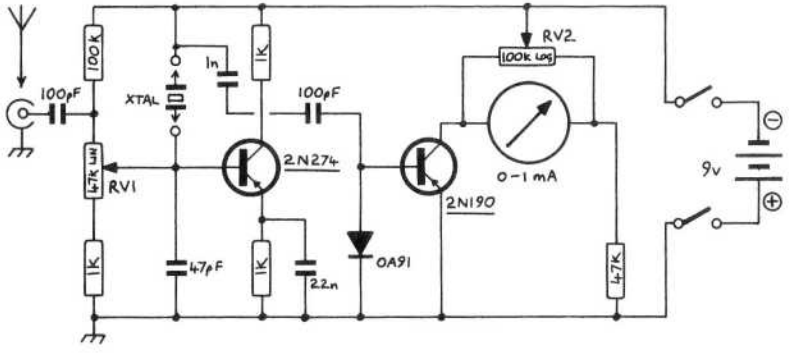
A GO/NO-GO CRYSTAL CHECKER

By Jose Robat ON7TP

Quartz crystals are widely used in amateur radio shacks, and none more so than in ATV. Crystals are used here in rigs, colour subcarrier generators, clock oscillators etc therefore it is important to be able to check them for activity since some will doubtless have been picked up at rallies or from surplus equipment.

I built this little unit several years ago with parts taken from the junk box, hence the use of germanium transistors! The circuit is shown below and needs little explanation except to say that it comprises a wide-range oscillator and a meter circuit.

Construction is not too critical, vero board being perfectly OK although a printed board would undoubtedly be nicer. The meter is not critical and any 1mA movement should work fine. On the original unit I used an FT243 crystal holder however different styles may be decided upon by the individual.



USING THE TESTER

1. Clip on the 9v battery.
2. Plug in the crystal and wait for a minute to allow the crystal to cool down after being handled.
3. Switch on, the meter needle will move up.
4. Turn RV2 slowly until the needle returns to zero.
5. Turn RV1 slowly until the needle moves, the moving of the needle indicates that the crystal is working.

NOTES

If a transistor with a higher Ft is used for Tr1 the unit may be used as a field strength meter.

Once the checker has been tested it should be housed in a suitable box. RV2 can conveniently carry the 'on-off' switch and the battery (PP3) should be provided with a suitable clip and housed in the box. It is best to remove the battery when the unit is not in use.

SOUTH AUSTRALIAN ATV

The South Australian ATV Group held its annual general meeting in June to discuss their affairs and elect officers.

The group's magazine 'The ATV'er' has ceased publication by the group however they hope to produce a newsletter in the future - copies of which are to be sent to the BATC Editor.

During the last year the group has undertaken many activities including the following:-

1. Building a new transmitter and receiver at their repeater, sited at O'Halloran Hill. The work has been done by Bill Simister and other members of the group.

2. A feasability study to determine the practicability of using mobile ATV equipment for bushfire fighting. Initially car and subsequently, helicopter-borne equipment was linked to equipment at the fire-fighting headquarters. Initial results showed that the method was definitely practical.

2. South Australia celebrates its 150th Jubilee in 1986. It has combined with Texas, U.S.A. in these celebrations since Texas is also holding its 150th Jubilee. At the opening, using the callsign VK5JSA, HF contact was made with the city of San Antonio, Texas. Dignitaries in Adelaide exchanged greetings with their counterparts in San Antonio. The amateur radio display had an average of around 2,000 visitors each day.

The ATV group set up its part of the display on the 6th floor of the Renaissance building - in Adelaide's business centre. The station was manned by members for a week and contact was made with members of the group in their home stations. The public were able to see and use amateur TV equipment and the children particularly enjoyed the contacts.

4. Visit to Telecom (our telephone authority). Members were shown much of what goes on in communication facilities provided by Telecom.

5. Visit to a local video production unit. Members saw interesting equipment being used in the production of effects for TV programmes. An impressive piece of equipment was a unit that enabled many visual effects to be digitally produced.

6. Demonstration of ATV to Adelaide Hills Amateur Radio Club at the local school. The demonstration took the form of a talk illustrated by two-way contacts with members of the ATV group in their own shacks.

7. The ATV group took part in Jamboree on the Air. Scouts and Guides from different troups were able to communicate with each other.

All in all it has been a very satisfactory year and membership is still growing.

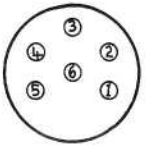
Charlie Baldacchino VK5ACF

CAMERA CONNECTIONS

By Andy Emmerson G8PTH

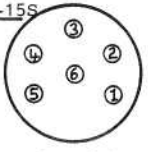
Users of Japanese cameras with external drive inputs may find the following table useful. The exact pulse amplitude is not critical and generally anything between 2 and 4 volts will suffice. On some cameras these inputs are terminated in 75-ohms, so a low impedance source is necessary (not TTL or C-MOS unless a line driver chip, such as the 74128, is used). Japanese cameras develop their own blanking and syncs, so only line and field drives are required. Additions to this table will be welcomed.

SONY



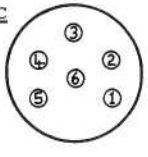
1. Video out
2. Field drive
3,6. Ground
5. Line drive

SHIBADEN HV-15S



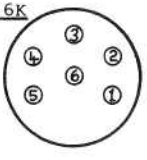
1. Line drive
2. Field drive
3. Mixed blanking*
4. Mixed syncs*
5. Ground (*not required)
6. Video out

PANASONIC



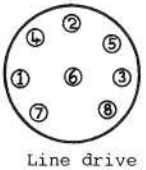
1. Video out
2,4. Ground
3. Field drive
5. Line drive

HITACHI HV-16K



1. Video out
2. Field drive
3,6. Ground
5. Line drive

IKEGAMI CTC-5000



1. Line drive
2. Tally light
3. Intercom
4. Field drive
5. Intercom Ground
6. Video out
7. Video in
8. Ground

CQ-TV - 35 YEARS AGO

In June 1950 CQ-TV number 5 was issued. The BATC had been in existence for a little over a year and the editorial (or "Editor's Note" as it was then known) makes interesting reading:

Dear OMs,

On the brighter side this month is the great encouragement we have received from the Editor and staff of the "Short Wave Listener". From now on, a page of notes on BATC activities, plus constructional articles, photographs, etc., will appear in that magazine, and possibly also in the "Short Wave Magazine" too. You will all appreciate what this means in terms of publicity alone, but also it means that the necessity for CQ-TV (which was only started as a temporary measure) will diminish. In time, I hope it will be possible to reduce the mag to a news sheet. The circulation is now too large for the printing to be easy.

I realise that more of you probably take the "Magazine" than the "Listener", but as we are not actually transmitting yet, it seems reasonable that we should appear in the latter. I think all members will join me in thanking the "Listener" for its help.

As far as the licences are concerned, it has been another negative month or so. No reply has been received from our own overtures, but the RSGB say they are "still negotiating". Apparently, questions are being asked in the House of Commons, which may be useful.

In the meantime, there appears to be nothing in the licence conditions, except the stipulation that "messages shall be in plain language", to prevent TV signals being transmitted as AM or FM, so long as no pulses are radiated. Thus, if the BBC's sync signals, picked up by an O-V-2 on 45mc/s, are used at each end for sync purposes, then only the picture content need be transmitted. This method has been employed in the USA, and is quite satisfactory, although, of course, transmission is limited to TV hours - when many TXs are silent because of TVI. A ruling on this method of transmission is awaited with interest from the GPO.

73s to you all,

Michael Barlow, G3CVO

As if to reinforce one of the above comments regarding CQ-TV but demonstrate doubts about another, the following advertisement also appeared in the same issue:

DOES ANYONE HAVE a rotary duplicator upon which they would turn out the mag. If I provide cut stencils and paper? No paging binding or crimping needed. You print it, and I'll put the covers on. Approx 80 copies, eight pages each. Offers to your perspiring editor, who is short of time! Would consider buying machine or swap for flatbed type, suitable cash adjustment.

REPEATERS AND THINGS

REPEATERS LICENCED AND OPERATIONAL

GB3GV is operational on FM only on channel RMT-2 (1249MHz input and 1318.5MHz output). Since a change to the new site at Markfield earlier this year, coverage has improved dramatically and operation has been virtually uninterupted for several months now. The aerials were installed at their permanent mast position on September 1st so improving coverage even further. Drawing from experience gained with the original hardware; a completely new repeater is under construction for GB3GV and this should be installed sometime this winter.

GB3TV, on top of the Dunstable Downs, continues to be operational. Also on RMT-2 activity through this repeater continues at a high level. Equipment reliability has been excellent and access is achieved regularly from as far afield as Northampton, whilst under lift conditions the machine has been seen in Whitstable and Rugby.

GB3VR - operational on RMT-2 although, at the time of writing (early September), it has been moved from its original site in Worthing to the QTH of another local amateur where it is only operational when the station can be manned. This new temporary location is just 200 yards away from the new permanent site in Brighton which will be occupied as soon as the necessary DTI permission comes through. The first ever non-UK signal through a British TV repeater was made earlier this year through GB3VR, by F1EDM. The machine has been equipped with a selectable test card system which has a total capacity of eight, although only three are so far available.

LICENCED BUT NOT OPERATIONAL

GB3UD is licenced for FM operation on channel RMT-2 and will be located on Mow Cop in Staffordshire. Now under the auspices of the Stoke-on-Trent Radio Society, construction should soon be completed.

GB3UT is licenced for AM operation on channel RMT-1 (1276.5MHz in and 1311.5MHz out). It is to be located at the university of Bath and construction of the hardware is continuing. Information from the Bath group as usual seems to be very sparse!

APPLICATIONS WITH THE DTI

GB3CT - application is for FM operation on RMT-2 from near the centre of Crawley in Sussex. The hardware is completed and operation of same in a NON-REPEATER mode (ie always attended) takes place regularly. Licencing is of course eagerly awaited.

APPLICATIONS ABOUT TO GO TO DTI

GB3AF. Application for FM operation on RMT-2 to cover the Durham, Newcastle on Tyne and Sunderland areas.

GB3GV(?). Application for FM operation on RMT-2 to cover the western part of Glasgow.

GB3PV. Application for FM operation on RMT-2 to cover Cambridgeshire.

GB3SX. Application for AM operation on RMT-1 to cover east Sussex and south west Kent.

GB3HV. Application for FM operation on a special RMT-3 channel to cover the western home-counties area. Input will be 1248MHz and output on 1308MHz - specially selected to avoid, as far as possible, the in-band QRM from a high-power radar at Heathrow.

Proposals for the installation and operation of the following projects have recently been sent to the RSGB Repeater Working Group. The following are resume's of the application documents which are published here for information and interest only.

GB3LET - A VIDEO BEACON FOR THE 13cm BAND.

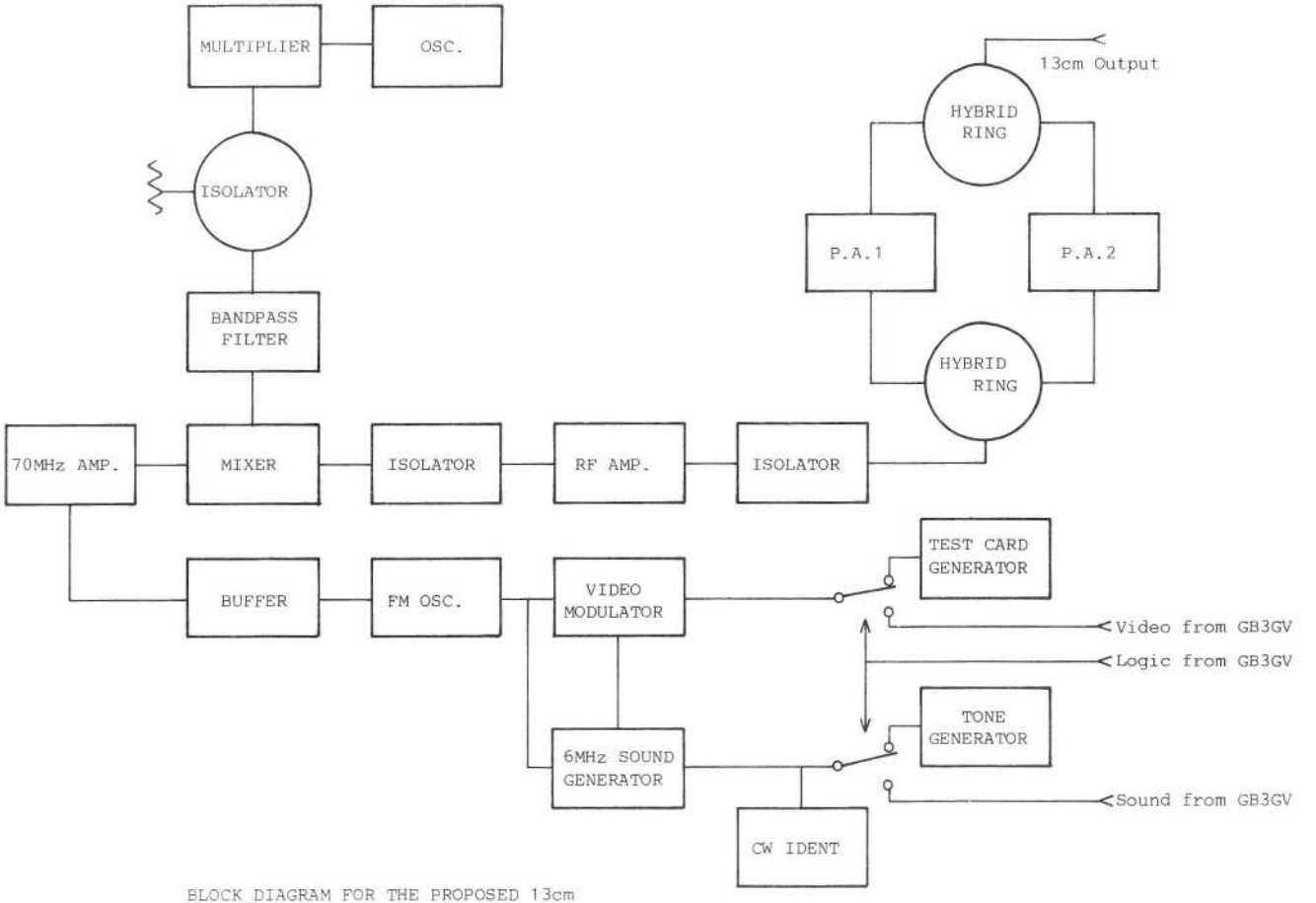
AIMS

The main aim is to provide the television amateur in Leicestershire and surrounding areas with a focal point for experimentation in video demodulation techniques, differential gain and group delay problems associated with wideband TV systems. The project will also serve to encourage people to explore this band and provide a monitoring point for assessing propogation characteristics. The beacon is designed in such a way as to provide a secondary output for the present 1.3GHz ATV repeater; GB3GV, when in repeat mode, so allowing further developments in transmit techniques in the 1.3GHz band, hopefully leading to a better understanding of the associated problems before tackling the RF designs required for the 13cm band.

TECHNICAL DESCRIPTION

The equipment is fairly standard and largely follows commercial practices. It consists of a local oscillator multiplied to the wanted frequency which is then isolated, filtered and fed to a hybrid mixer. The IF input to the mixer is at 70MHz and the resultant signal is fed to a single-stage valve amplifier which is isolated at its input and output. This is then fed to a hybrid ring dividing the signal into two paths of relative phase. Both paths go through linear amplifiers and are then re-combined in another ring which feeds the final output power of approximately 5 Watts to the aerial.

The 70MHz IF signal is provided from an FM oscillator and buffer amplifier, the signal being created by a video modulator and 6MHz inter-carrier sound system. The modulating signal comes from two sources; the first being internal and consisting of a colour test card to CCIR system I standards, and a sound channel consisting of a continuous tone which is removed once each minute to allow a identification to be transmitted. The second modulating source is external and is provided by the television repeater GB3GV. When the repeater receives a valid signal it will pass a logic signal to the beacon which will then switch from the internally generated test card to the video at the repeater's receiver. At the same time it will remove the continuous tone allowing only the one-minute CW idents to continue and connect the sound received by GB3GV (if any) to be transmitted on the beacon's inter-carrier sound channel. When the signal on the input of GB3GV is removed the beacon will instantly revert to its normal internally generated source.



BLOCK DIAGRAM FOR THE PROPOSED 13cm ATV BEACON STATION - GB3LET

SPECIFICATION

Video modulation.....FM, positive sense.
Sound modulation.....FM via a 6MHz carrier.
Video deviation.....8MHz with a 1.25MHz modulating signal.
Sound deviation.....+/-50KHz.
Video bandwidth.....5.5MHz.
Sound bandwidth.....300Hz to 15KHz flat, 20dB down at 18KHz.
Video ident signal.....Colour test card with callsign at picture centre.
Sound ident.....CW callsign and locator at 1-minute intervals.

On completion of the project it may prove necessary to employ video pre-emphasis in accordance with CCIR recommendations. If this is so the video deviation would be set at 2.2MHz with a 1.25MHz modulating frequency which should result in an average deviation of 8MHz.

GB3LEV - A VIDEO BEACON FOR THE 10GHz BAND

The aim of this beacon is to provide the midlands area with a known FM video source in the 10GHz band. This will help to stimulate interest in microwaves and encourage the development of high quality wideband demodulation techniques. It is intended that the beacon have an ERP of around four Watts producing wideband FM television with 6MHz intercarrier sound. A testcard generator will provide the video source whilst a tone generator will produce a continuous tone changing to a CW callsign ident and station locator once every minute. It is hoped, in order to further the development of 1.3GHz repeaters, to relay signals received by the existing repeater GB3GV through the beacon thereby assisting in the setting up of 1.3GHz transmitters. It is envisaged that a time limit on the length of the relayed signal will be set, at the end of which (or when the station vacates GB3GV) the output from the beacon will revert to its internally generated vision and sound signals. The morse identification cycle will remain operational throughout such relaying.

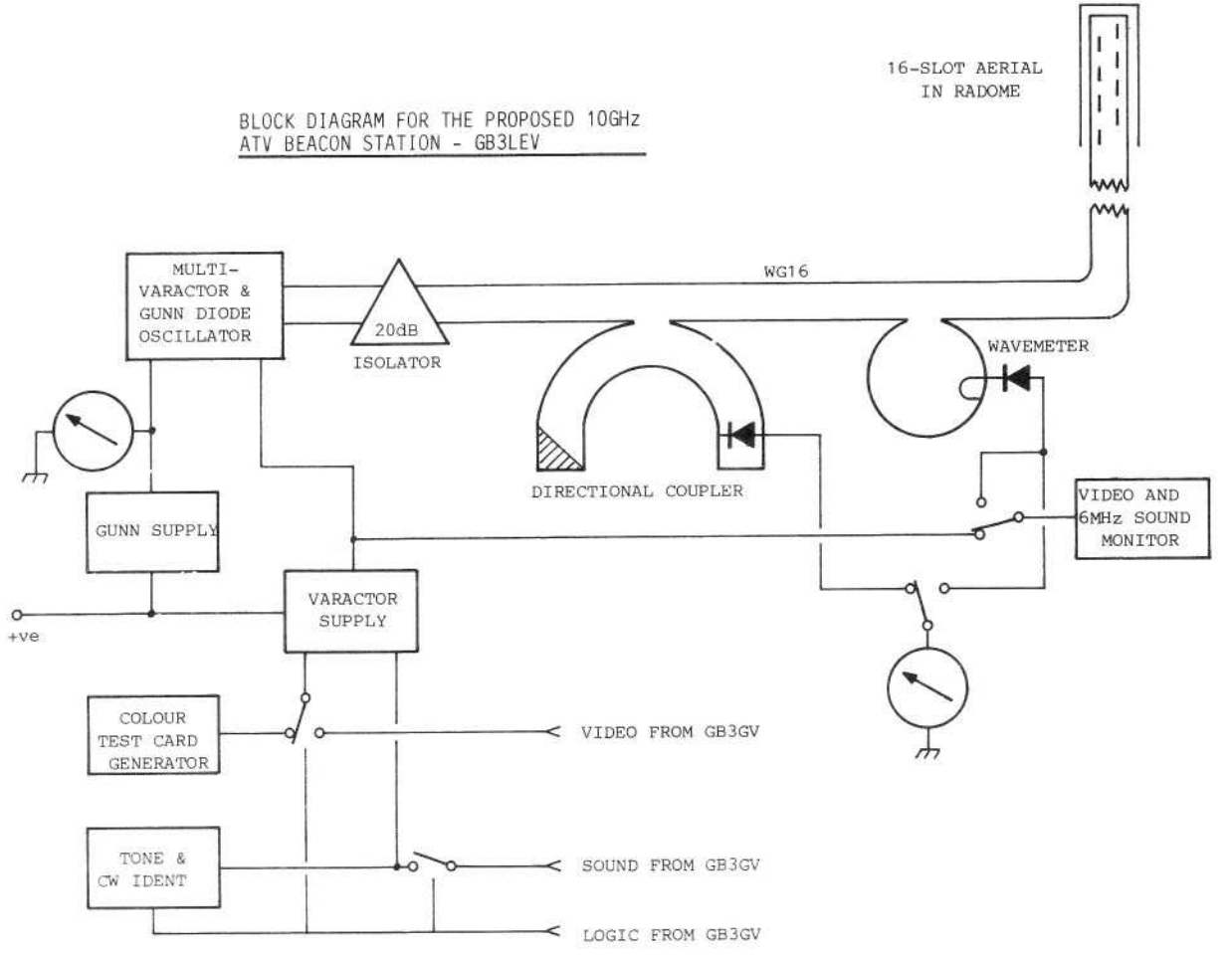
TECHNICAL DESCRIPTION

The unit consists of a special multi-varactor and Gunn oscillator which is followed by an isolator, splitter/detector assembly and a wavemeter. The aerial will be fed via WG16 waveguide.

The video source is to consist of a purpose-built colour testcard generator producing standard test patterns. Audio tone and CW ident signals are introduced and the composite signal then passed through a pre-emphasis network conforming to CCIR recommendations. The beacon carrier is modulated to a peak deviation of 8MHz with a modulating frequency of 1.25MHz. The 6MHz intercarrier sound will be 10dB down on the video carrier level and will be modulated to +/- 50KHz with an audio bandwidth of 100Hz - 18KHz. The video bandwidth will be limited to 5.5MHz and will be standard 625-line PAL colour to system I specification.

Construction of the project has, in part, been completed in the normal course of development work carried out by the Group, this makes the proposal a feasable and cost-effective undertaking which would provide immense benefits to the local amateur radio fraternity.

BLOCK DIAGRAM FOR THE PROPOSED 10GHz
ATV BEACON STATION - GB3LEV



NOTES ON A VIDEO PROCESSING AMPLIFIER

By Brian Dandy G4YPB

The circuit of a processing amplifier on page 29 of the last issue, which formed part of John Goode's article 'In The Studio', has inspired me to make replacing my existing unit (from the 1976 BATC Handbook) my next project, and I intend producing a printed circuit board for the amplifier if anyone is interested.

Whilst considering how to interface the new unit into my existing system I have jotted down one or two ideas which may be of interest to others similarly employed:

The processing amplifier requires a source of clamp pulses and these may be derived from mixed syncs by using the circuit in Fig.1

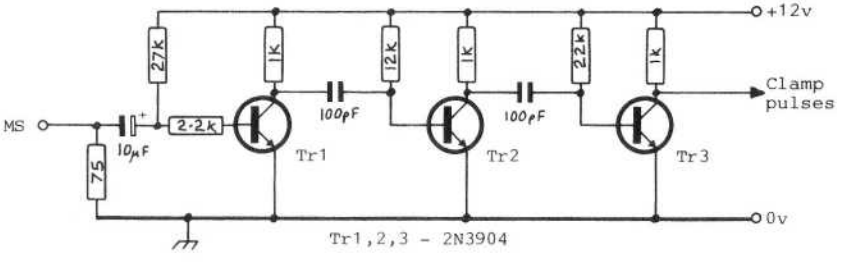


Fig.1 CLAMP PULSE GENERATOR

If only monochrome use is required, the 'Black & Burst' (sync) feed can be derived from the mixed sync input to the clamp pulse generator thus (Fig.2).

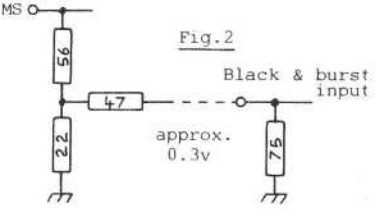


Fig.2

The mixed blanking input can duplicate the Tr1 circuit used in Fig.1 however, the collector load resistor should be increased to 4.7k. The output is taken directly from the collector itself.

Brian Dandy G4YPB. 21 Summerhill Avenue, Kidderminster, Worcs DY11 6BY

THE WORTHING AND DISTRICT VIDEO REPEATER GROUP PRESENTS

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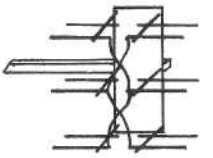

The Worthing aerial is now available in kit form, with the tricky bits pre-drilled and is the ideal aerial for ATV repeaters as it covers the whole of the 24cms band and has been used by the repeater Group members for over two years now and will be used on the repeater GB3VR when it moves to it's new permanent site. The aerial comes complete with straight forward instructions and should only take an hour or so to complete. The aerial kit costs £10.95 including P&P.

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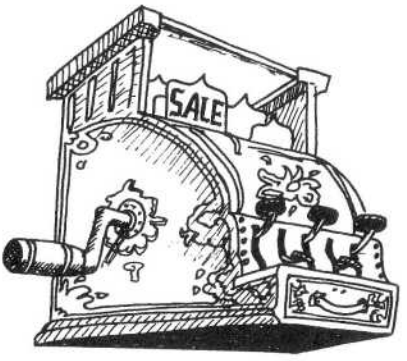

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The above are sold on a 'see and collect' basis, or by special arrangement.
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Andy Emmerson G8PTH, 71 Falcutt Way, Northampton, NN2 8PH. Tel: 0604-844130.

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SATELLITE TV down-converter or receiver system for 12GHz band. ALSO looking for down converters from both 4 and 12GHz to either 70MHz or band 4/5. WOULD like some technical information or contact with anyone doing this kind of work.
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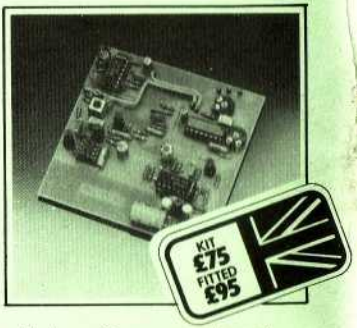

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