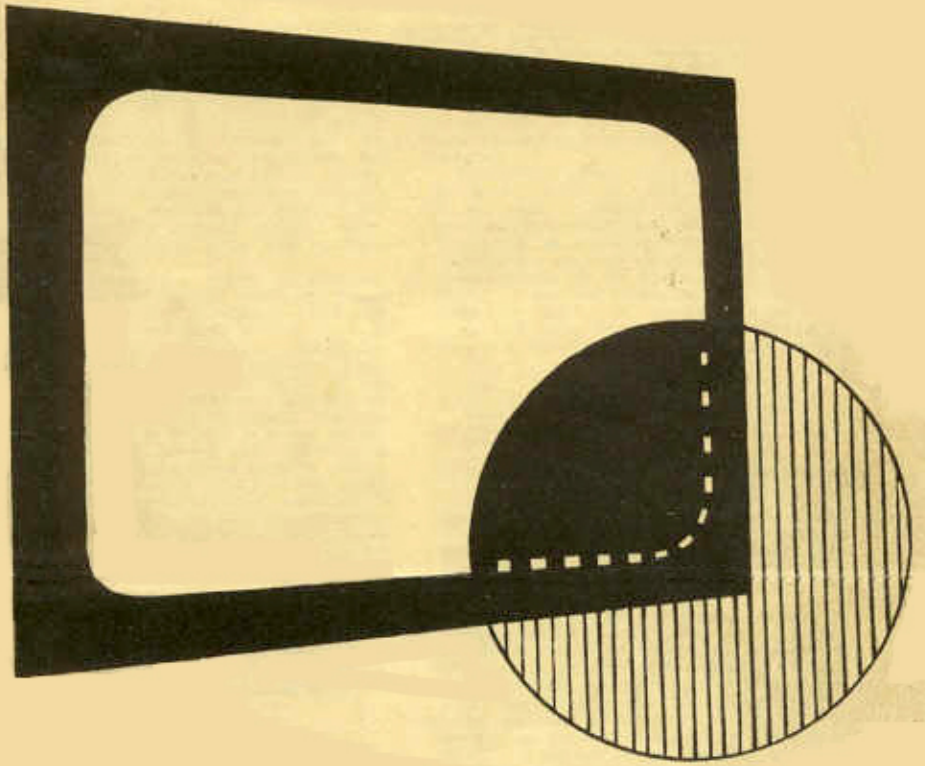


cq-tv

October 1954

At least five shillings per annum.

Equivalent rates overseas: $1 (USA); DM3 (Germany); 250f (France); f2.50 (Netherlands); 450 lira (Italy); etc.

Number Twenty-Two.

Sixth Year.

The British Amateur Television Club is affiliated to the Radio Society of Great Britain.

STAFF NOTES

LICENCE news this month is the welcome announcement that holders of a vision-only licence are now permitted a sound channel, on the understanding that sound messages transmitted shall relate solely to the vision signals being transmitted. The actual amendment is to section 1.(1).(b) of the Vision Licence; sub-section (i) permits the use of the station for vision, whilst a new sub-section (ii) permits the "sending by radiotelephony or morse telegraphy messages relating solely to technical matters connected with the sending and receiving of the said visual signals". In addition, the callsign need only be transmitted by cw or phone on the vision channel every 30 minutes, instead of every 10 mins as before.

Members will be very pleased to hear this, and our thanks are due to the GPO for their consideration in this matter. No mention is made of permitted frequencies for the sound signals, but it seems reasonable to assume that these may be in any of the bands in which vision is also permitted.

STANDARDS have received an overhaul, and new proposals are submitted in this issue. Please let the Hon. Sec. know if you have any comments to make.

EXHIBITIONS are always a popular source of publicity for Amateur Television, as evidenced by the number of requests for demonstrations received. In view of the difficulties of one person having to provide all the gear, and yet making it possible for all units to work with one another, the Club standards have been drawn up. In addition it is proposed to have a team of members with all the necessary units on tap for various shows. At first this will apply to the London area, and anyone who would care to join the demonstration team should send a note to the Hon. Sec at 56 Burlington Gdns, Chadwell Heath, Essex. Please give details of any units available, including size, weight, power requirements, transport available, and notice needed to put the gear in working order. There is nothing binding in this, of course, but we have already had several offers of help, and would like some more. Would those who have already written in the past please confirm the details with G3AKJ. Particularly required is a tape-recorder, and spare cameras, plus any number of willing helpers. Once the scheme is organised, we shall be able to give a live show of any degree of complexity anywhere in the London area. Perhaps North country members might like to organise something similar at, say, Manchester, or Bradford. Note that the BATC will not have a stand at this year's RSGB show, although there will be a TV exhibit by G2WJ/T.

SUBSCRIPTIONS, may we remind you, are renewable on January 1st, that is, after the next edition. The Hon. Treasurer would be very grateful if people who are out of step would send a covering cheque or PO to bring their subscriptions in line.

CQ-TV begins to look rather like a text-book at times due to the articles being required for that handbook of TV transmission we hope to print. If this upsets you, kindly let the Hon. Editor know.

WHEN writing in, please try and get the right "official" first time. Money should go to the Hon. Treasurer, normal notes and enquiries to the Hon. Secretary, and ONLY enquiries relating to CQ-TV to G3CVO. The latter has very little time for answering letters, and if they are passed to other Club officers for attention, severe delays are unavoidable. In this connection we are very grateful for the offers to occupy the Staticon chair; enquiries concerning these tubes should go straight to Mr D.Hooper G3ICU, of 42 Casselden Rd, NW10, who has all the Club's technical data.

MR.MACWHIRTER G3ETI has had to resign his post as Committee member due to pressure of work, and Mr. Bill Hall, of 11 Gransden Rd, E8 has been nominated as his successor. He will be remembered for his good work at RSGB and other exhibitions. If no objections are received, Mr Hall will be considered confirmed in office as from Dec 1st 1954. The Club is in urgent need of area organisers for the Midlands (especially Nottingham), North (Liverpool, Bradford) and Scotland, with a view to arranging local BATC meetings in these areas. The Chelmsford group expect to hold a series of monthly meetings during the winter. London area members please contact G3AKJ for information.

"CQ-TV" is published for the British Amateur Television Club at 10, Baddow Place Avenue, Great Baddow, Nr. Chelmsford, Essex, and appears quarterly.

CLUB STANDARDS

The Committee have recently reviewed the position with regard to Club standards, and have made some further recommendations. Note that these are only recommendations, not binding in any way, but that all units loaned by the Club for exhibition purposes will conform to these standards. We shall be glad to receive any comments and suggestions.

Recommended standards:

(a) Electrical:
All outputs 1 volt peak-to-peak across 75 ohms. Composite signals to have white positive, sync negative. Syncs on their own to be negative going. Normally, only frame and line sync, separate or mixed, video and composite feeds will be used.

b) Sound:
Studio sound equipment will normally be provided in toto. Where, however, sound and video are to be distributed at RF, inputs to the sound mixer and/or modulator should be 1 volt across 600 ohms.
Intercommunication facilities: a Central Battery system will be used, so that operators will only require a headset and carbon microphone each. A three-wire system will be used, one wire also carrying cue signals. 6 volt cue lamps should be used, one side being grounded. Operators to make their own arrangements here - provided they supply their own headsets, etc - or use two PO 2-way jacks, one for headset, one for mic. Wire in series. 3-wire input to a terminal block. For call-back a shorting key across the speech lines may be used.

(c) Mechanical:
Either standard GPO 19" racks, or 15" racks to be used (the latter will go in a car).
19" panels to be multiples of 1¾" high, drilled 0 B.A (¼") clearance, 7/8" up from edge, 7/8" in from edge, 1¾" centres.
15" panels to be multiples of 2" high, drilled 2 B.A (No 10) clearance, ½" in from edge, 1" from bottom edge, 2" centres. Vertical members of rack to be not wider than 1⅛", 1" optimum.
Belling-Lee standard ¼" co-ax pugs and sockets for all video equipment (the Club is negotiating for trade discount on these).
H.T will be supplied at +250V regulated and bias at -150V. 6.3V AC will also be available.

These standards will be printed inside the covers of CQ-TV in due course.

NEWS AND GOSSIP

May we remind you that there is a great demand for old copies of CQ-TV, and we are always pleased to receive any for which you may have no further use.
Wanted: Nos 5,6 and 8 to complete set: G3AKJ.
Nos 20 and 21, plus a few 19, are available from G3CVO at 1/6 each, post paid. Both sets of back copies are due back very shortly, and will be available on loan again. Apply G3CVO. State whether all, first 10, or 11-20 are required.
Please note that with the exception of the Mazda 6F33, all valve types shown in CQ-TV will in future be given NATO numberings, ie USA type or Phillips numbers.
In answer to queries, overseas members can obtain badges and notepaper and membership certificates from G3EKE, 307, Norbury Ave, SW16. Price 3/6 ea, 2/6 for 50 sheets, and free on application respectively.
Members are also free to use the Club badge on their own paper, etc. If any overseas member wishes to send out notices to his countrymen or to add local pages to the magazine, G3CVO can easily send copies of CQ-TV in bulk to any address.
Arthur Critchley reports that some CRTs will operate as staticons. Focus a scene onto the raster, and put a load resistor in series with the beam current circuit. Signal-to-noise ratio is poor, but 1Mc has been resolved.....
Part 5 of the series on Amateur TV appeared in the September 54 RSGB Bulletin: "Mixers and Modulators".
Please note that G3CVO is now at 10, Baddow Place Ave Gt. Baddow, Nr, Chelmsford, Essex.
We still require practical data on telecine gear.
May we remind new members that no morse is needed for the television transmitting licence. Full details from the GPO Radio and Accommodation Dept, St. Martins le Grand, EC1. The cost is £2 per annum.
Monoscopes (£7-10-0) and Staticons (£25); order forms from G3CVO.
Various EMI 15" crts, also CR6121s, heater/cathode shorts, various conditions. 20/- to 50/-, plus 6/- post: G2DUS Sunnyside, Wallington, Nr Baldock, Herts.

CORRECTION: CQ-TV No 21 P9, "A Simple RF Distribution Unit". The decoupling condenser in the anode of the triode should be 1μF not 0.1μF as marked.
To last month's list of officials, please add Mr. Dave Hooper, of 42 Casselden Rd, NW10 to the list of co-opted members. Mr Hooper is handling Staticon data in place of Mr. Russell.
We note that Alpha Radio of Leeds have 931As @ 6/9d.
M.Powell, 13 Tudor Ave, Chelmsford, offers 5765s in suitable numbers in exchange for 832 829 and 931As.
G3CVO is to be found on 145.1Mcs most evenings at 1900; we are considering re-opening the BATC sked on either 160m or 80m and invite comments.

CHELMSFORD MEETING: November 10th at 7.30 p.m at 10, Baddow Place Ave, Gt. Baddow, Essex. This is mainly for Chelmsford and district members, with a view to starting a regular series of meetings during the winter. First meeting: Introduction to TV Transmi-ssion, with illustrations.

Mr. and Mrs. Michael Barlow wish to thank all members for their kind messages (and rhyming telegrams!) on the occasion of their recent marriage.

County Corner: Nottingham: O'Connor, Buchanan, Cox, Slang and Turney.

It is apparent that to provide a separate cathode follower for each output required in the whole system would be very expensive. Two cables cannot be fed from the one output, since if they are each correctly terminated, the load resistor is only 37.5 ohms, and the output voltage drops to one half. Several units can be connected by looping through, as in Figure 1/8. Only the last unit has a terminating resistor, the rest being connected across at high impedance.

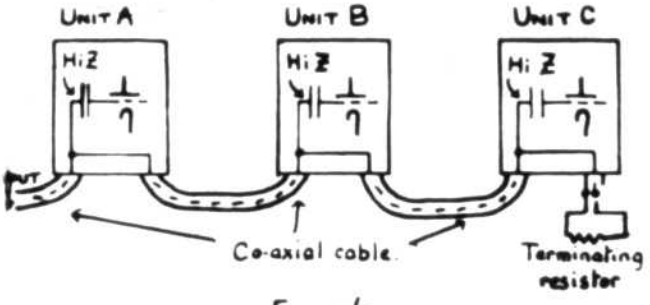


Fig. 1/8

Allowing one cathode follower per type of pulse required, it pays to keep these down to a minimum. Now, unit C, the vision-syno-blanking mixer, requires mixed sync and mixed blanking inputs from the shaper unit; to save using separate sync separators in each unit, line and frame drive (or sync) are fed separately to all units. For reasons that will be explained later, mixed sync is also required in all camera units proper for suppression purposes. The outputs from our shaper unit need only be, then, Line Drive (L.D) Frame Drive (F.D), mixed sync (M.S) and mixed blanking (M.B). Note that M.B is only required by unit C, and if this is close to unit B, the M.B pulses can be fed out at high level, saving a cathode follower.

The video signals are treated in exactly the a same way, looping through and terminating where required. In Unit J, the vision mixer, special care must be taken to maintain the correct terminations on the output and on all inputs whatever the settings of the mixing controls. Full information is given in Chapter 5.

It will now be clear that ANY unit that is required to work with standard equipment will expect to be provided with "Sync. In" (or "Line Drive" and "Frame Drive") and "Sync Out" sockets, plus "Picture In" and "Picture Out" (or as is relevant) sockets, each input being normally repeated as an outlet also to enable looping-through to be performed. In this way any number of units can be joined together in any combination, provided the specified voltages are adhered to. For amateur use, the recommended standards are:
All outlets 1 volt across 75 ohms; sync pulses going negative, video waveform going positive to peak white, and composite picture-plus-sync with peak white positive.

One further point remains to be dealt with. During the synchronising pulses, the various time-bases in the camera and monitors are flying back, and to avoid these flyback lines appearing on the picture, a suppression pulse is required to make quite sure that no picture output is produced during sync periods. As will be explained in Chapter 4, the sync pulses themselves can be used as suppression pulses. However, due to slight delays introduced in the various cables and circuits, straightforward mixing of several inputs would cause small transients to occur when the suppression pulses overlapped, and to avoid this it is usual to have longer "blanking" pulses - which have other benefits too, see Chap 5 - which are introduced at the latest possible point in the chain. Having once ensured complete lack of picture during sync periods in this way, the actual sync pulses are then added again in the correct manner to produce the desired waveform (see Chapter 4). These operations are performed by Unit C (Fig 1/5), the Sync-Vision-Blanking Mixer.

We have now dealt with the basis of the complet transmitter, and can proceed to go into more detail, taking a unit at a time. In the next chapter, a simpl Flying Spot Scanner (FSS) will be described, and the more complex units will follow.

References:

Practical Television Engineering, Scott Belt. (Rin- (Rinehart Books).
Television Engineering, Fink. (McGraw-Hill).

"CQ-TV", published quarterly at 5/- per annum, gives full details and up to date news of Amateur TV happenings. A specimen copy and application form can be obtained by writing to the Hon. Secretary, the British Amateur Television Club, 56 Burlington Gdns, Chadwell Heath, Essex.

The RSGB "Bulletin" carries bi-monthly reports of amateur TV activity. A specimen copy can be obtained by writing to the Secretary, Radio Society of Great Britain, 28 Little Russell St, London WC1.

Amateur TV reports also appear in "Wireless World", "The Short Wave Magazine", "Radio and Television News", "QST", "Practical Television" and various foreign-language periodicals.

A USEFUL NOTE:

BBC Band 1 transmitters.

TELEVISION FREQUENCIES		
STATION	VISION Mcs	SOUND Mcs
Alexandra Palace	45.00	41.50
Sutton Coldfield	61.75	58.25
Holme Moss	51.75	48.25
Kirk o' Shotts	56.75	53.25
Wenvoe	66.75	63.25
Pontop Pike	66.75	63.25
Glencairn	45.00	41.50
Truleigh Hill	56.75	53.25
Douglas, Isle of Man	66.75	63.25

Sooner or later the owner of some television transmitting equipment will want to give a public show, and for this a certain amount of gear will be needed that is not normally required for amateur TV use. To make a good show, no doubt various units will be borrowed from other amateurs, and the importance of standardising cable outputs, voltages and also mechanical arrangements will be apparent. This has been mentioned briefly in Chapter 1, and is dealt with in detail in the Appendices. Given standardised units, there will still be various interconnecting units required which may not have been built since the station did not previously require them. For example, if several cameras (or picture sources) are in use, a Vision Mixer unit will be required so that any desired source can be switched to "Transmission". Intercommunication facilities, and cueing arrangements, may be needed; a mobile camera dolly, title boards, a sound system, microphone booms, etc are all items required for even a very modest demonstration, whilst a distribution amplifier for feeding the video signals out to domestic TV sets (used as monitors) is an absolute necessity. Very often these items are left to the last moment, with the result that the show is not as good as it might have been; for a public demonstration, this is indefensible.

The first unit to be described is a Vision Mixer. This unit is Unit J of Figure 1/5 in Chap 1 (also CQ-TV No 21), and it takes in up to four different picture inputs, which can be cut, faded or mixed in any proportions. In addition, preview facilities are provided so that any camera channel can be monitored either before or during the time it is actually on the air. Circuits are included for lighting cue lights at any camera in use, or a push-button will flash a warning to any selected channel just before it goes on the air. (The terms "camera" and "on the air" may not be accurate but are self-explanatory). It will be recalled that the vision inputs to this unit should be suppressed but not blanked (that is, the true blanking pulses should not yet have been mixed with the video signal, this being performed in the next unit ("C"), the vision-syno-blanking mixer; see Chap 1 for details). In actual fact the presence or lack of particular pulses will not affect the operation of the mixer, provided that each input conforms to standard, that is 1 volt d.a.p, white positive, from a cable requiring to be terminated in 75 ohms (see Chap 1). The output from the unit is again 1 volt from two outlets, one for the vision-syno-blanking mixer and the other to the preview monitor.

Referring to Figure 11/1, the four inputs are brought via co-ax to the 75 ohm non-inductive pot-entiometers used as individual faders. If correct value resistors cannot be obtained, higher values may be used at the expense of non-linear fading by shunting the variables with fixed resistors. The use of inductive wire-wound components is only likely to affect operation above 4 Mc/s. Note that the co-ax should be run right up to the tags on these variable resistors. Four push buttons of the "Transmission" bank feed out to a common line; the fifth button, "Mix", is arranged to feed this common line to the input of the main amplifier when any of the first four buttons are pressed. Remember that with normal push-button assemblies, each button returns to normal when another is pressed. When the "Mix" button is pressed, the four "Cut" buttons are disengaged, and the four potentiometers are brought into circuit. A fifth potentiometer is used as a master fader at the input to the main amplifier. It is not necessary to use co-ax for the connections to the buttons, provided that the co-ax is terminated as above.

A second bank of buttons is used for "Preview". These are wired in a similar manner, so that, for instance, two inputs may be faded up together to the right level on the monitor independent of the channel actually on the air. To do this, it is necessary for the preview amplifier to have a very high impedance, and the main amplifier to have a very low impedance. If this is not done, there may be a noticeable change in the transmitted picture if the same preview button is pressed. The circuits of the two amplifiers are shown in Figs 11/2 and 11/3. They have a gain of 12 dbs to make up for the losses in the mixer unit, are 3 dbs down at 4Mcs, and give a 1 volt positive output into 75 ohms.

It is advisable to use differently coloured buttons for the "Cut" and "Mix" buttons to avoid embarrassing moments. Before pressing the "Mix" button, the operator must be sure to check that the potentiometers of any unwanted channels are turned right back. A sixth button, coloured blue, perhaps, can be used as a "Censor" button, to short the main amplifier input to ground. A sixth button on the preview bank can be used to monitor the signal going into the main amplifier, i.e "Transmission".

Other contacts on the buttons can be used for cueing and indicator light purposes. 6 volts of AC will normally be supplied from the intercom. unit, and this can be used to light cue lamps at the cameras whenever a "Cut" button is pressed, and all four when the "Mix" button is pressed. A similar circuit via the "Preview" buttons, but with a spring-loaded push button in series (or a small flasher) can be used to call or warn operators by pressing the appropriate "Preview" button.

A similar unit can be used to combine the outputs from several vision mixers, although this facility is unlikely to be required in any amateur demonstration! The sound mixer could be built along the same lines, but this would be unnecessarily complicated, and the reader is referred elsewhere for suitable circuitry.

Another very important facility needed at any show is a good (and reliable) intercommunication system. This normally consists of indicating lamps, and a telephone system so that camera operators can talk to the producer, and so on. The lamps are

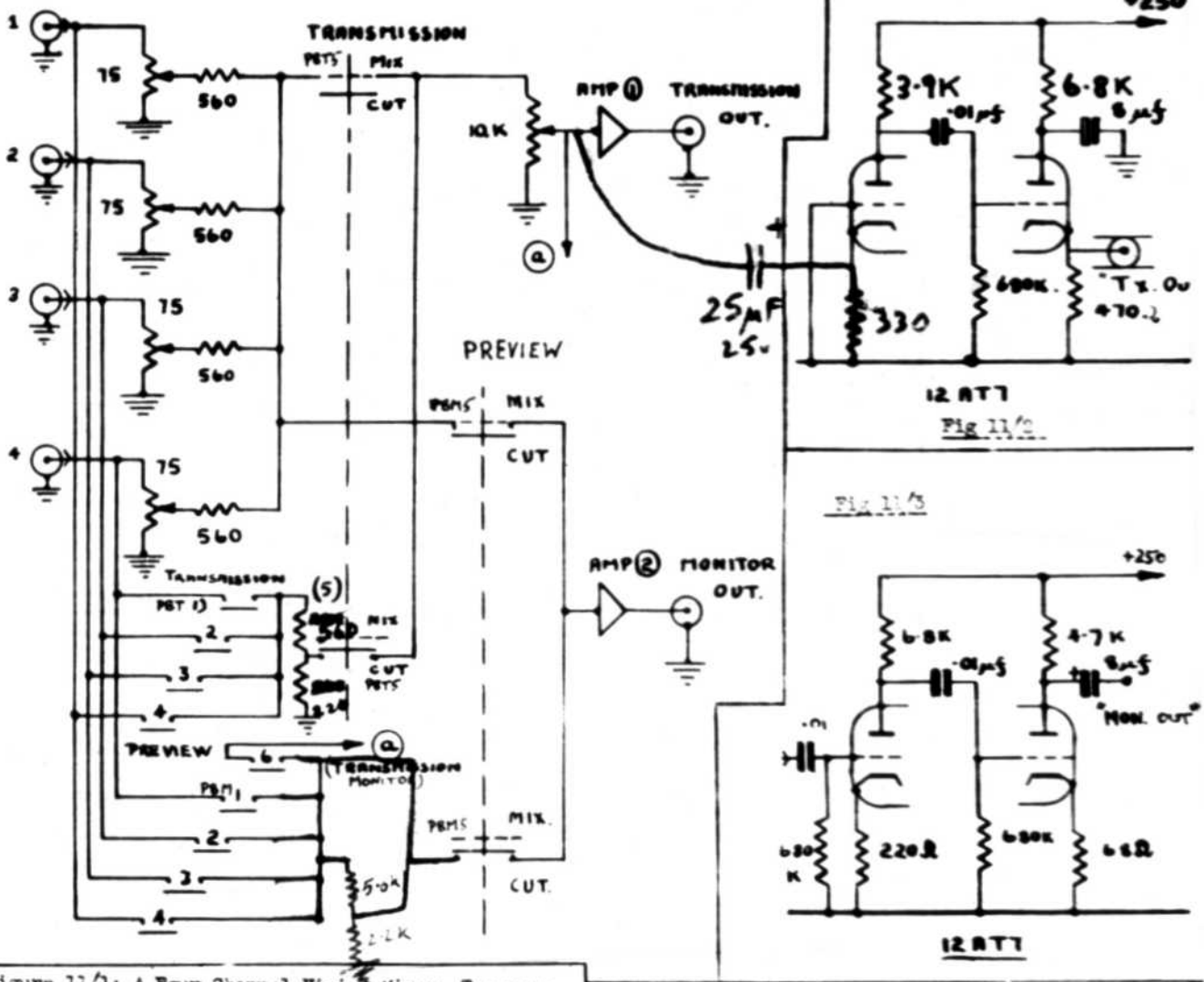


Fig 11/2

Fig 11/3

Figure 11/1: A Four Channel Vision Mixer. Two rows of push-buttons (for preview and transmission) select any one of four inputs, or any combination of them. Figs 11/2 and 11/3 (top right): the transmission amplifier, and the preview monitor amplifier. Fig 11/4 (bottom right): suggested circuit for cueing. PBM and PBT refer to the Monitor and Transmission push-buttons.

particularly necessary if the operators must remain silent in the studio. It is customary to use a red lamp to indicate "on the air", but this should be in view of both operator and artistes; a camera, for instance, might well be fitted with two lamps, one at the rear for the operator, and one at the front for artistes. Standard 6 volt bulbs, with one side earthed, can be used, the bulbs being operated by switches or push-buttons at the producers desk, or as indicated above.

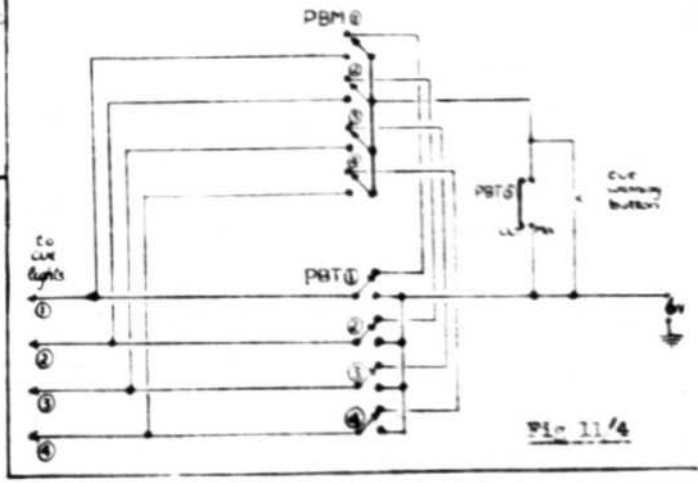
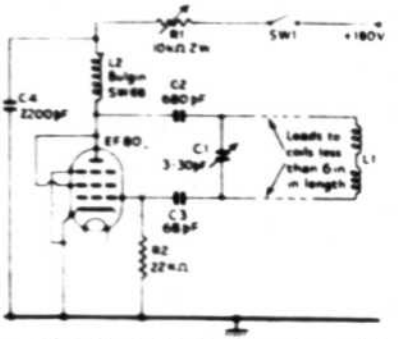


Fig 11/4

Novel Ideas

SPOT-WOBBLE CIRCUIT from Mullard *Outlook*

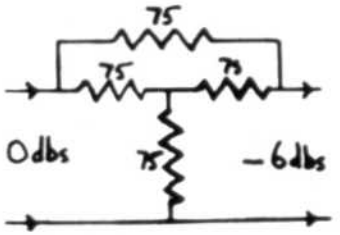
Spot wobble is a device for rendering the line structure of a television picture less noticeable, by causing the spot to move not only horizontally across the picture, but also to vibrate vertically at a comparatively high frequency.



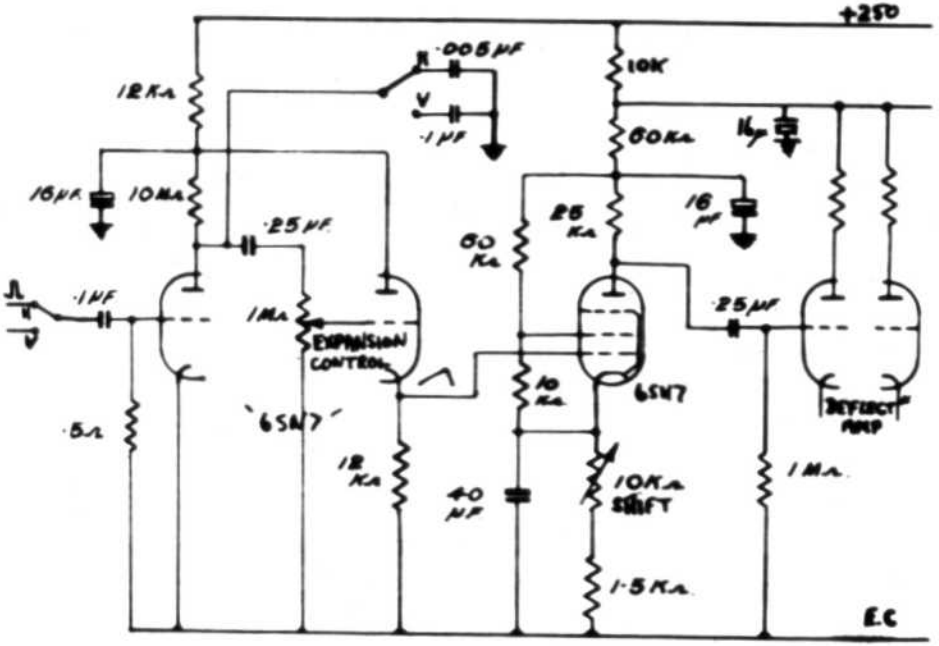
The design of a spot wobble circuit depends mainly upon the layout of the receiver. Thr circuit shown provides a useful starting point. Before attempting spot-wobble, however, make quite sure that the spot is well focussed, that there is no astigmatism nor deflection defocussing, and that the interlace is good - otherwise spot-wobble is unlikely to bring any improvement. In this circuit a triode connected EF80 is the oscillator, resistor R1 being adjusted until the picture lines just merge together. Thw switch SW1 permits focussing to take place with the spot-wobble switched off. HT consumption is 12mA at 180V.

The "wobble"coils comprise a pair of saddle-shaped windings similar to normal deflector coils, but much smaller, and without a yoke. Each coil consists of 5 turns of 26 swg wire (enamalled). These are wound on a rectangular former 1⅛" x 1½", and later folded around the neck of the tube with the shorter dimension parallel to the axis. The coils should be on opposite sides of the neck, immediately behind the main coils, and may have to be within the focus yoke. The length of the leads to the oscillator should not be more than 6". The oscillator frequency is tunable around 12.5Kcs, condenser C1 being adjustable to avoid IF beats and spurious patterning.

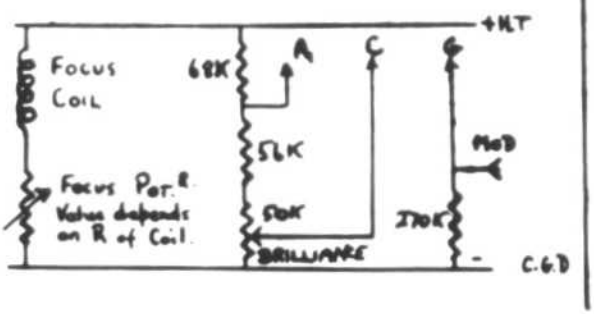
M O



A 6db attenuator can very easily be made up from four resistors each equal to the characteristic impedance of the line to be attenuated. Thus for the usual 75 ohm line, four 75 ohm resistors are required in the bridged-T network shown above.



5FP7 VOLTAGE CHAIN



Eric Cornelius sends us his trace expansion circuit. By means of this he can expand the trace up to at least 50 screen diameters, so that detail in the frame pulse region is more easily visible. V1a amplifies and integrates either line or frame pulses, V1b cathode following. V2 takes a slice of the sawtooth and amplifies it, feeding out to a paraphase deflection amplifier V3. With this circuit there is some interaction between trace expansion and trace shift controls, and readers may like to exercise their ingenuity to remove this should they feel that it is a nuisance.

STBSaB/D

"WHAT THE OTHER CHAP IS DOING...."

A long letter from Ian Waters (Ely) says that Ian finds the RAF (Henlow) and ATV don't mix too well, activity over the last few months being nil. Nevertheless, Ian offers his help to the London team at any time. He is taking out a /T ticket, and adding a 4" viewfinder to the camera, and thinking hard along 70cm lines (resonant, that is...).

Bill Stapleton (Dublin) has pressed on, and now has a 220V 160mA regulated PSU, complete counter chain and waveform monitors going. He found a 9:9:5 counter unreliable for day-to-day operation, and has gone to 3:3:3:3:5 with multivibrators. He also wants a letter from George Short...

Doug Wheele G3AKJ has been busy organising a TV exhibit for the QRP Society's show at Walton-on Thames last Oct 30th. He is also trying to organise a demonstration team, and asks anyone interested to contact him. Minor overhauls of the two cameras are in progress, and some interoom equipment is being gathered. P.A.Waspe of Chelsea wishes to contact any S.London member who has a camera chain running with a view to mutual co-operation. G3EKE has been tree-felling and building a new pulse generator.

Frank Lee of St Albans is now G3JVO/T, and wonders if he is the first of our members to get a TV ticket. His new tx will be on 445.5 Mcs with a 33B/152M in the final; he says these cost £7 each. Frank suggests the Club might build up a stock of valve data, and offers to look after this side.

The "gang" at G2WJ/T have been busy overhauling the gear for the RSGB exhibition. A new viewfinder for the camera, and a 45Mcs distribution amplifier (as in CQ-TV 21) have been built. The latter is giving some trouble, and Jeremy (and 3CVO!) would like to know of anyone else who has had results. Regular transmissions on 436Mcs are put out each Saturday at 1830 beamed South from Dunmow. 64 element stacks at 2WJ and 3GDR (Abbotts Langley) make this path a certainty under all conditions, and the signals are tremendously strong. Wireless World had a photo of results over this path. Excellent.

Ivan Howard G2DUS/T is now putting out a 405 line picture most weekends on 432.2 Mcs, usually a step wedge with 1Mcs bars. The tx uses a CV82 at about 5 watts. Ivan wants ideas on how to keep a 16mm projector-plus-5527 camera in step with the mains and frame sync.

Dave Hooper G3ICU has been looking after the technical enquirers re Staticons, and has sorted out some useful circuitry. A monoscope looms ahead too. A 5FP7 is replacing the 3FP7 in the FSS; Dave sent in a photo of the early results with this, and they look good.

Hendrik de Waard PAoZX is still in Sweden at the Nobel Institute, and reports that he has met Bengt Barkland, but that the latter is not active at the moment. PAoLQ (Leiden) is building a 5527 camera and already has the pulser built; this delivers standard CCIR signals. Hendrik passes on the news that the patent rights of that binocular viewfinder used in the Gronigen mobile TV camera have been sold for a good sum to an optical firm. Congratulations.

W.Jacobs VK6WJ of W.Australia is an old friend of Eric Cornelius; he has a VCR112 FSS with 5BP4 as monitor, running at 200 lines. Results are quite good, and more elaborate gear is now being built. Eric has received his Staticon, but at last news he could get no picture from it! He wants gen on the 3HP7 - any offers?

Bill Worthington (Cheadle) has planned his layout now, and wants information on the use of the MW6/2 projection crt at low EHT. He is thinking of using double lens focussing. The tube is to be used as a viewfinder for the Staticon.

Tony Sale (Rayleigh) is another after the /T licence. The 12AT7 MO 33B/15M BA drive unit is now putting 30mA of grid drive into the p-p 8012s. A cathode follower modulator is in use. The new 5527 camera is very satisfactory, only 100 watts of light being used in the studio. This is made possible by a development of the idea given in CQ-TV 18 in which a magnet is clamped onto the camera lens housing. Normally, the 5527 suffers severely from tilt and bend, and increasing the video gain forces the blacks and whites into saturation. By viewing the output waveform on the CRO, the magnet can be adjusted to correct most of the bend, and it then becomes possible to turn up the video gain. Tony thinks the effect is due to charge redistribution across the mosaic. With the normal direction of scan, there is a diagonal force acting on the scanning spot and its secondary electrons due to the area already scanned. The magnet counteracts this force, so that the secondaries can distribute themselves naturally.

John Watts showed his camera and pulser at the RSGB Bristol Convention, but a last minute hitch prevented the gear from actually working. John has made a very fine job of these units. M.Barlow G3CVO has been busy moving house, etc, but has found time to build a 4 channel vision mixer (see P4) for the London group, plus a modulator and power pack regulator for his own use. The new pulse generator is slowly taking shape, and the CRO is well on the way. A 16 element stack on 70cms has successfully been interlaced amongst a 4 over 4 on 145 Mcs by making no elements longer than 12". Having both arrays at the same height and pointing in the same direction is a decided asset.

Pete Matthews had a fine exhibit at the Radio Show at Earls Court. A 7FP7 flying spot scanner, plus overhauled pulsing mixing and monitoring gear was on view. A very fine effort, Peter. Grant Dixon has been busy building test gear to improve his colour results and has also circulated all the colour fans he knows. If anyone else is interested in colour work and has not yet heard from Grant, please write to him at 23 Wye St, Ross on Wye, Herefordshire.

THIS MONTH'S NEW MEMBERS:

M.Arthur GW2FTV	336 Middle Rd, Gendros, Swansea.
D.A.J.Baker	Cozy Nook, Nr Queens Head, Purleigh, Essex.
J.W.Bruce	10 Dalcross St, Partick, Glasgow.
G.Cleveland	Capilano, Dorset Rd, Avondale, Salisbury, S.Rhodesia.
A.W.Critchley	18 Lindsay Ave, St Annes, Lancs.
Alan Ellis	3 Spencer St, Turner, Canberra ACT. Australia.
Mr. Foyard	c/o Bradford Technical College, Bradford, Yorks.
J.Harris	2 Kenley Mount, Moor Ave, Wibrey, Bradford, Yorks.
G.Higgins	17 Third Ave, Bradford Moor, Bradford.
W.Jacobs VK6WJ	154 London St, Mt Hawthorn, W.Australia.
P.K.Jones	13 Burrard Rd, W.Hampstead, NW6.
J.Law G3BMA	21 Linton Rd, Penn, Wolverhampton.
E.H.Lewis	11 Gleave St, St Helens, Lancs.
Dr N.Patchett	c/o Bradford Tech College, Bradford.
N.F.J.Schembri G3CEM	4 Twitton Bungalows, Pilgrims-way West, Otford, Kent.
G.L.Sharpley	14 The Crescent, Flixton, Manchester.
F.Snellgrove	3 Third Acre Rise, Botley, Oxford.
G.M.Sutcliffe	12 Upper Bell Hall, Savile Park, Halifax, Yorks.
D.C.Turner	262 Stechford Rd, Ward End, Birmingham 34.
John Williams	7 South Richmond St (Top flat) Dublin.

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Changes of Address:

W.J.Tarrant, c/o LATCRS London Airport, Hounslow, Middx; P.Parkin, 42 Lytton Grove, West Hill, Putney SW15; C.Stanford, 24 Hants Drive, Writtle, Essex. M.Barlow, 10 Baddow Place Ave, Gt Baddow, Essex.

Eddie Darrall G2BCB at Colchester is busy building a new house, and so has not had time to improve or rebuild anything. H.Heath of Stow-on-the-Wold is still trying out 70cm transmitters. Brian Hember G3SFUU (Balerno) is now dehobbed, and is pressing on with the colourtelestill gear. Paul Wright is now home in Wolverhampton, and is pressing on with the LF rig before getting down to ATV again. No news from the Liverpool squad.

With great regret we have to announce the deaths of two of our members, Mr D.E.Hill, of Sydenham, and Ton van Aggelen, of Haarlem. Mr Hill was licensed as G3IKF, and had been a member since 1952. Mr van Aggelen PA0KN was a very active Dutch TV amateur, with his own 5527 equipment. He was a KLM radio operator by profession, and was lost in the "Willem Bontekoe". Our sympathies are extended to the relatives and friends of both members.

The Editor would like to apologise for the delay in production of this issue, and also for its brevity on economy grounds. No 23 should appear soon after Christmas, and will be of normal size. Remember that the more members we have, the better magazine we can produce, so please try and enrol more members whenever you can.

CROSSWORD SOLUTION

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