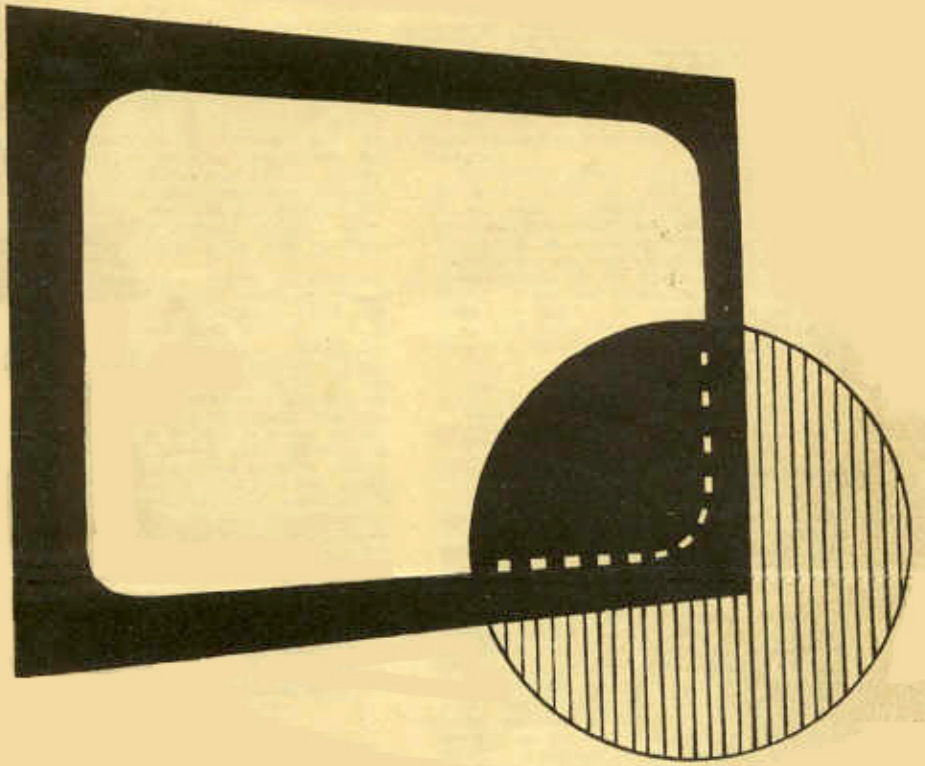

cq-tv

January 1954
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Published for the British Amateur Television Club at 29, Loftin Way, Chelmsford, Essex.

CQ-TV

Number Nineteen
Fifth Year.

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

Editor's Note:

Firstly, Season's Greetings to all our members old and new, and good wishes for 1954. Next we must apologise for the delay in publication of this edition due in part to the Christmas rush but mainly, as will be seen, to the fact that we have been experimenting with a new printing process designed to make the diagrams more legible and also to give you more printed space per edition. It is emphasised that this initial printing is experimental on our part, and that improvements will be made in due course. However, it is hoped that readers will agree with our decision to have the next edition printed throughout. Our thanks are due to our various printers for their help, as always.

In the course of a year, some 500 letters must be answered by the "staff" of the BATC. As this is a hobby only, we attempt to spread the load as much as possib--le, and ask your help in various ways. One of the biggest time-consumers is the recording and listing of receipts, reminders and the like which have to go out with each edition. In order to save this rather immense amount of work, and in particular to help out the Hon Treasurer, we are asking for your co-operation in a new scheme. In future, ALL SUBSCRIPTIONS WILL BE RENEWABLE ON JANUARY 1st. This means that March reminders will be asked to pay 4/6d, June 3/-, and October 6/6 (being next year's subscription as well). Then all subscriptions will be renewable after the December edition, and THE ONLY REMINDER WILL BE PRINTED IN CQ-TV. Furthermore, NO MORE SECOND REMINDERS CAN BE SENT. No 5/- between January and March = no CQ-TV. If you care to send more than one year's subscription, particularly this year with its awkward amounts, the Hon Treasurer will deal with it. Please note his address is now 307, Norbury Ave, SW16. Receipts, except for first subscriptions, will continue to be sent out with the March CQ-TV.

May we ask overseas members who are subscribers to please arrange to transfer the equivalent of five shillings to the Hon. Treasurer, also on January 1st? It will often be convenient if one member in each country collects all the subscriptions for that country; may we have some volunteers? (Approximate subscription rates now are 250 francs (France) 450 lire, 3 Dm, 2.50 guilders, 36 Belgian frs).

Mr Don Bradford, G5GBO, has relinquished his Committee membership as he is now in Kenya as VQ4EV. Mr Ian Waters of Ely has kindly offered his services, so that the officers of the BATC are now Chairman: Mr G.C.Dixon, MA, of 23 Wye St, Ross-on-Wye (who deals with CPS cameras and colour work), Hon Sec. M.Barlow G3CVO, 29, Loftin Way, Chelmsford, Hon Treas: Mr L.A.F.Stockley, G3EKE, of 307 Norbury Ave, SW16 (who also deals with ALL first enquiries); and Messrs Wheele G3AKJ (Chadwell Heath), Macwhirter G5ETI (Manchester) and Rose G3BLV (Sunderland), and Ian Waters at 14, St Mary's St, Ely. We also require volunteers to look after the files on Monoscopes and telecine work.

There is, to date, nothing further from the GPO on the subject of TV licences, but perhaps 1954 will bring that to add to Grant's Colour experiments!

Yours sincerely, M.Barlow, Hon Sec.

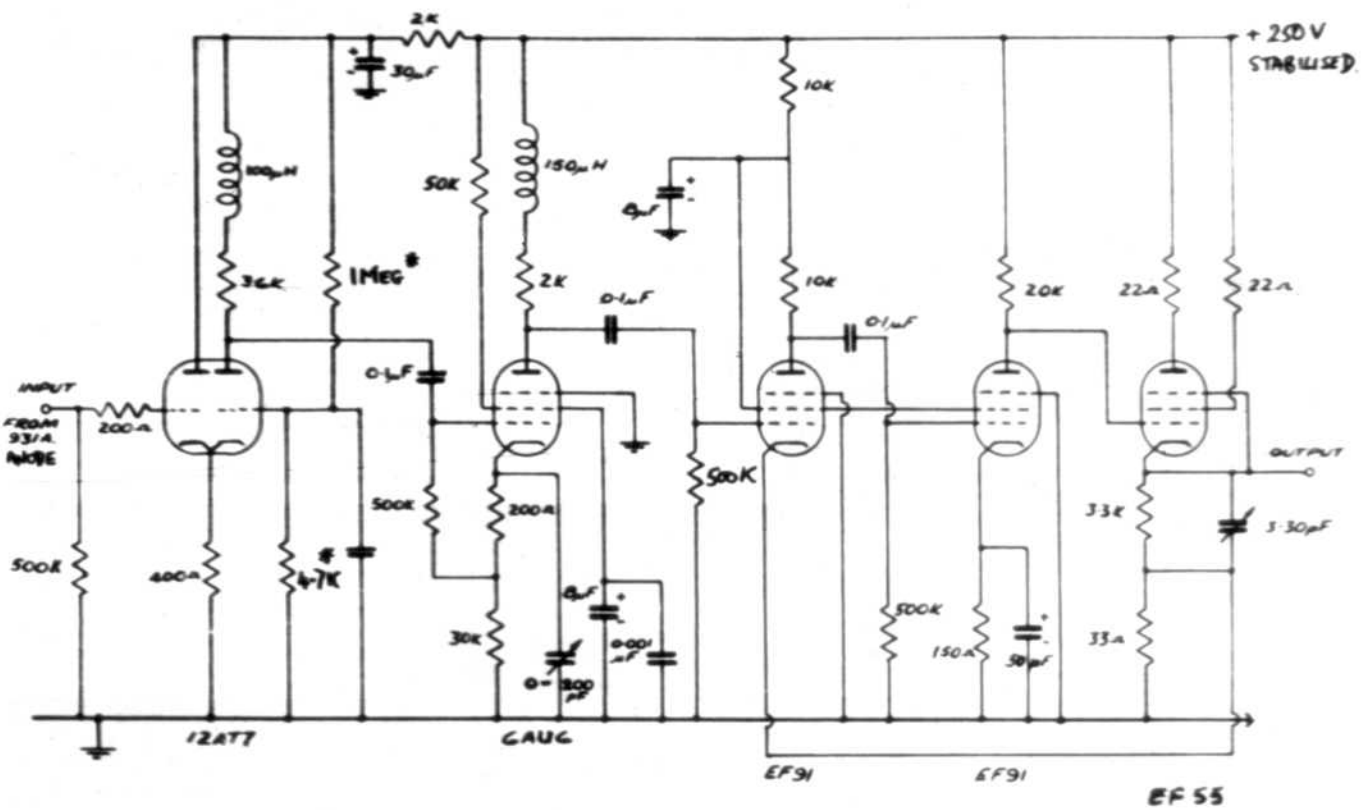
THIS MONTHS SHORT NOTES AND NOTICES.

There are copies of CQ-TV No 18 available @ 1/6 each, but all other editions are now completely sold out. Two complete files of back copies are in circulation; a note to G3CVO will put you on the list. Please do NOT keep the file longer than one week.
Order forms for Monoscopes and Staticons can be obtained from G3CVO. These are now £7-10-0 and £25 respectively. The monoscopes are mainly test card C (others by request and with possible delay) and are perfect except that they must be magnetically focussed and deflected, the electrostatic focussing being unusable. Standard deflection and focussing yokes can be used, and here are further details:
Heater 6.3V 0.3A, Anode 1kV (c 100µA) Target 5-25V rel to anode, Grid 15-45V rel to cathode. Signal current approx 5µA, positive output, output capacity c 10mmF. The lower screen is connected to anode, and should be bypassed to earth; the upper screen may be earthed directly. Htr cath voltage 50V max; oa length c 16", max diam 5⅜" neck diam 35mm. Delivery 3-4 weeks. THESE TUBES ARE UNLIKELY TO BE AVAILABLE TO MEMBERS NOT RESIDENT IN THE BRITISH ISLES.
Photostat copies of the official Staticon leaflets will be available on loan to those members who have completed an order form. More detailed coil data follows in due course, and it is our intention to publish full details of both tubes in CQ-TV in the near future.
In answer to a query, the suggested standard for telestill work is double-35mm-cine, i.e normal 35mm still camera size, or 2 x 2 slides.
931A holders in polythene are available from Smiths, Edgware Rd for 2/3d.
Messrs Philpotts (Cabinets) do non-standard sizes of cases for the same cost as more standard sizes. Eg 10" x 8" x 6" approx, with let down sides, ventilating louvres and carrying handle (rubber feet optional) just right for a Staticon - about 40/-.
G2DUS at Sunnyside Wallington Nr Baldock Herts has the Club Electronic AVO, and will send it on receipt of postage.
Now the mag is being partly photoprocessed, it would help the Editor if you would do diagrams neatly in Indian ink on a plain white background up to 10" wide and any depth up to 16". Thankyou.
Do you know there are 16 BATC members in and around Liverpool and Manchester? And not one TV station on the air there?
CORRECTION: CQ-TV No 18 p6; one of the discriminator diodes should be reversed.
Lapel badges 3/6 Club paper 2/6 and subscriptions from / to the Hon Treas at 307, Norbury Avenue, SW16.
"Colour TV" tape and "Dagenham Show" 16mm silent film available on loan.
TV Sked: 3612 kc/s Sundays at 1430 local time.
Useful background material for lectures in the December Wireless World: "Amateur TV". Can anyone let me see the TV article in QST this month please?
A 4" CRT with a full scan and a 6" x 2" transparency in front of it has a limiting resolution of 3 Mc/s for a photocell at 10" distance, with NO optical system at all.
Mullards have blue trace 3" tubes £4-10-0 and 1½" £3-15-0 (Frank Lee).
6V6 6AT6 6AQ5 6X5 6X4 6AL5 6BE6 12AT7 6BA6 R16 8-9/- or so, plus 1R5 1S5 3V4 1T4 1U5. From F.May 19 Prebend St, Leicester. Bill White of 56 AMQ, RAF Waddington Nr Lincoln is off to Canada and has a huge stock for disposal, eg 931As £1 -£2, 7FP7 £1, 45Mcs strip £1, 600V o.2A 375V =.1A 200V 0.1V stab Power pack £7-10. B7G tubes @ 5/-. SAE.

Michael Barlow has very great pleasure in announcing his engagement to Margaret Legge of Cambridge. To those of our close friends to whom this is the only announcement they have received, our apologies, and we hope you will wish us both good luck.
Many thanks too on behalf of all BATC "staff" for the Christmas cards and Seasonal Greetings received by us. These wishes are most heartily returned by all.
FOR THAT SPECIAL OCCASION: BUY HER A SUBSCRIPTION TO "CQ-TV".....!

mlmb

A FLYING SPOT SCANNER AMPLIFIER



CIRCUIT DIAGRAM OF THE FLYING SPOT AMPLIFIER

This circuit was designed by Jack Mason, ZL1QS, and is interesting for its somewhat unusual design. A 12AT7 cathode coupled input stage provides a high input resistance, and is directly coupled to the photocell anode. The right hand grid is maintained slightly positive to put the correct bias on this half of the valve. The circuit values marked with an asterisk were not supplied by Mr Mason, and are only optimistic guesses. We shall be pleased to hear of anyone who has tried the circuit and found the correct values to use. As the output voltage from this stage is high enough to ensure a good signal to noise ratio, the second stage is used as a frequency compensating stage, in which correction is applied for the scanning tube afterglow, and the like. The last three stages are a feedback-pair amplifier that is theoretically flat to 7 Mc/s, and is similar to that described in CQ-TV No 16 using MF50s and MF55s. Jack says that the overall response using a 5FP7 scanner tube is 3.5Mc/s with very nice picture quality. Altogether a circuit that can be recommended.

One or two additional points arise. It is, we repeat once more, essential that the HT supply to the amplifier be electronically stabilised, or very low frequency picture bounce (oscillation) will occur. The cathode of the photocell is taken to a well-smoothed negative supply of some 500 volts, preferably adjustable (a 2K series variable resistance will do). The 9 dynodes are connected to a chain of 39K resistors, dynode 9 being taken to earth via another 39K resistor. No clamping circuit is used, but it is essential that the scanner tube flyback be suppressed in order to establish a Black Level to which the signals may later be DC restored. The output will be from 5 to 50 volts peak to peak depending on the photocell amplifier, the cell voltage, the scanner tube brilliancy and the type and opacity of the transparency. Members are reminded that it is in their interest to build scanners to take 2"x 2" slides. A phase-reversing stage can be added to permit the use of negative transparencies. No optical system is required if the cell is at least 10" from a 3½" scanner, but a condenser lens may increase the output. If an optical system is used - and it should be with 2 x 2 slides - the inside of the scanning box should be darkened with matt black paint, but this is not necessary otherwise.

This circuit would presumably also be ideal for a monoscope amplifier, provided the signal at the anode of the 12AT7 is sufficient to over-ride noise in the amplifier.

STOP PRESS

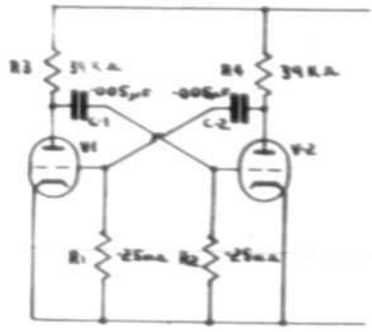
As we go to press, the exciting news arrives that Grant Dixon, of Ross-on-Wye, has at last succeeded in transmitting closed circuit TV pictures IN COLOUR. On Christmas Day, he was able to resolve a test chart of coloured shapes satisfactorily. Although pictures are not yet sufficiently brilliant, and although one or two snags remain to be ironed out, Grant feels that he has now broken the back of the work involved, and that from now on things should be much easier. All units appear to be working satisfactorily, although some hum pickup is spoiling colour registration at times. Those members who were at the RSGB Show will have seen photographs of the equipment, which, unfortunately, Grant is not allowed to demonstrate in action. Since Grant has done all the work on his own, with very few tools, very little space, and no works of reference to hand, his success is all the more remarkable, and deserves heartiest congratulations.

MULTIVIBRATORS

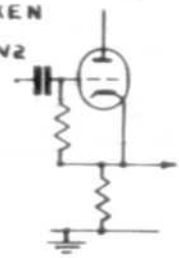
Multivibrators are very often used in TV pulsing equipment and a knowlege of their various designs and performances is of considerable value.

Multivibrators usually consist of two valves, each feeding the other. When the gain of the circuit of either valve exceeds unity, a cumulative effect builds up, with first one valve and then the other being cut-off, the other carrying a heavy current with its grid at earth potential. A "standard" multivibrator therefore has two unstable limiting conditions, that is, it will be free-running. Its output consists of pulses, which may be used directly, or the multivibrator may be used for multiplying up or dividing down, or, with an external charging condenser, it may be used as a time base circuit. The circuit is shown below:

STANDARD MULTIVIBRATOR



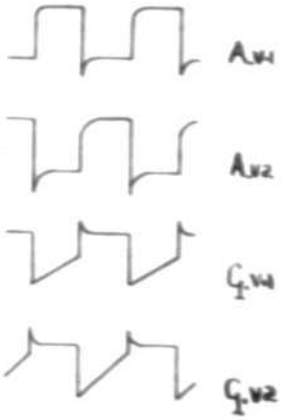
THE OUTPUT MAY BE TAKEN FROM K-V2



Taking the output from the cathode reduces the loading on the multivibrator, and consequently reduces frequency pulling effects.

The operation of the circuit is quite straightforward. As the anode current I_{a_2} of V1 increases, the voltage drop in R3 increases, so that V_{a_1} drops. The condenser C1 passes this drop to the grid of V2, reducing I_{a_2} and increasing V_{a_2}. This increase is fed back to the grid of V1, increasing I_{a_1} still further. I_{a_1} rapidly reaches a maximum, whilst V2 is cut off, until the charge on C1 has leaked away through R3 and R1. As soon as this occurs, V2 conducts again, and the process is reversed.

THE WAVEFORMS OBTAINED ARE



The rise-time of the positive-going edge of V1 anode waveform depends on the time constant R3xC1, whilst the rise from the negative spike has a time constant R1xC1. The amplitudes are not drawn to scale; the grid waveforms have an amplitude approximately the same as the grid base of the valves, whilst the anode waveform depends on the current swing in R3 and R4, perhaps 100V.

These waveforms are for a symmetrical multivibrator, that is one in which valves, components, wiring layout, etc are as nearly identical as possible for both valves. It will be noted that the waveforms produced are also symmetrical, the pulse appearing at V1 anode being the mirror image of that at V2 anode and so on. Changing the time constants by altering C1, R1 or R3 (or R2, C2 and R4) will alter the mark-space ratio of the output. The output is never perfectly square, but always has a slight pip on it, due to grid current momentarily charging the condenser. The rounded corner is due to anode-to-cathode capacity in the valve (see later for use of pentodes). Increasing the anode load resistor increases the rounding but reduces the pip.

FREQUENCY OF THE MULTIVIBRATOR

For a symmetrical (1:1) multivibrator, the time-constant of operation may be simplified to R1C1 approximately, and

$$\text{Frequency} = 1/3R_1C_1.$$

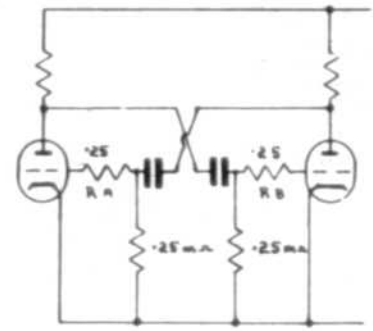
If the grid leaks are returned to HT+ instead of earth, then

$$\text{Frequency} = 1/R_1C_1.$$

Both figures are approximate only. The FREQUENCY may be varied by returning the grids to a variable positive voltage. The AMPLITUDE depends on the supply voltage, and is only slightly affected by the grid return potential. At high frequencies, stray capacity makes the frequency equations inaccurate, but the multivibrator is good up to several hundred kc/s with careful design.

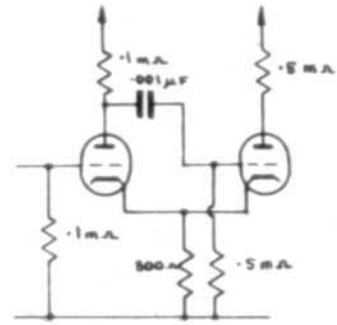
Now let us look at some modifications to the basic circuit, and consider their advantages.

SQUARE WAVE MULTIVIBRATOR



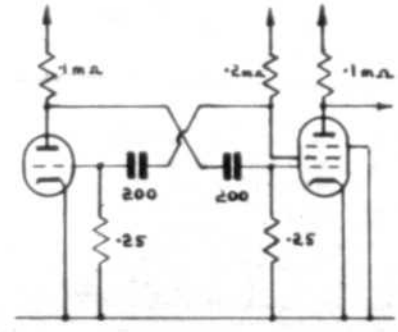
R_A and R_B tend to square the output by grid limiting. The frequency and amplitude of operation are affected only slightly.

CATHODE COUPLED MULTIVIBRATOR.



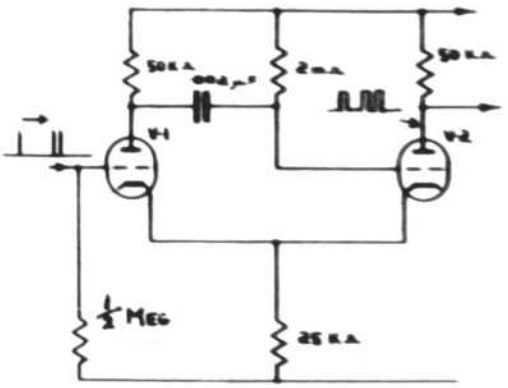
This has the advantage that a grid is available for synchronisation, and an anode for the output, giving a degree of isolation in both cases. Free-running, the frequency tends to be erratic.

ELECTRON COUPLED MULTIVIBRATOR

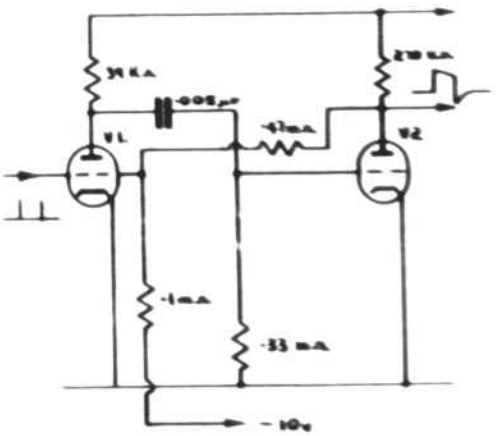


Either a triode-pentode or a twin pentode arrangement may be used. Electron coupling gives isolation and also independence of HT volts. The pentodes give large square outputs due to plate circuit limiting. Switching can also be introduced on the suppressor grid(s). The frequency is as for the basic unit.

ONE SHOT MULTIVIBRATOR

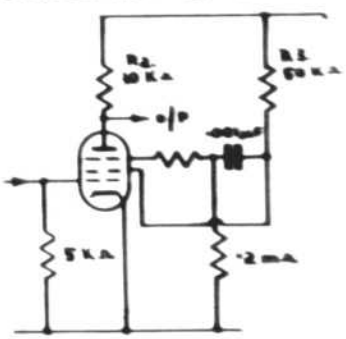


This is also called a "flip-flop". A trigger pulse flips it over, and after a time delay it flops back again on its own. V1 is normally cut off by the current through V2 flowing in the common cathode resistor. Positive trigger pulses reverse this stable state, but after time t the circuit restores itself. A longer time is taken if the grid leak of V2 is returned to cath-ode instead of HT+. The period t is approximately that of the equivalent basic circuit with the values of V2.



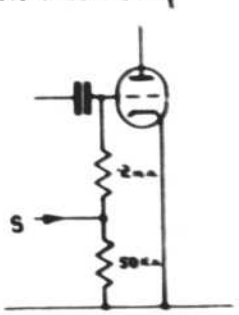
This circuit is a variation of the above, but needs a negative supply.

SCREEN COUPLED FLIP FLOP



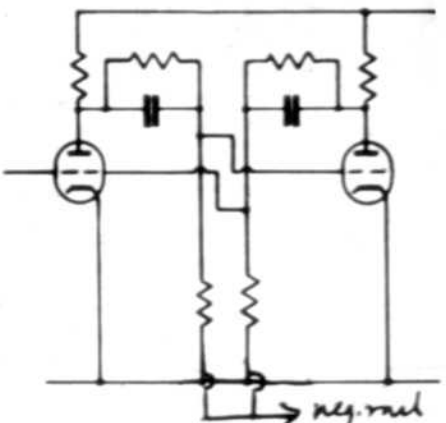
(This circuit is of a screen-coupled flip-flop, and is included for comparison and completeness).

SYNCHRONISING



In order to lock the multivibrator to an external pulse, a sync pulse can be introduced at any grid or anode, or, if necessary, at a cathode. A small condenser is all that is necessary (10pF or so), but depending on the choice of electrode, the multivibrator will look on either the leading or trailing edges of the sync pulse. Thus the positive-going edge will trigger a cut-off valve on the grid. An alternative method is shown, the sync pulse being introduced part way up the grid leak. In this way one of the main difficulties - the feeding back of the multivibrators pulses into the synchronising source - is overcome. It is better to use a free electrode where one is available.

So far these circuits have been oscillatory, with the exception of the flip-flops. Some very similar circuits are not, however, in spite of their appearance. One such circuit is the Eccles-Jordan switch. This is a circuit with two stable states; one trigger pulse sets one valve conducting and the next cuts it off again. This is brought about by the DC couplings between the two valves. The condensers are only there to improve the switching speed, and are NOT comparable with the coupling condensers employed in the normal multivibrator.



The circuit shown acts as a binary counter, since one output pulse is obtained for every two input pulses.

References: Puckle; Time Bases. 2nd Edn, Chap 3 & 6.
Electronics Manual for Radio Engineers, FF09.

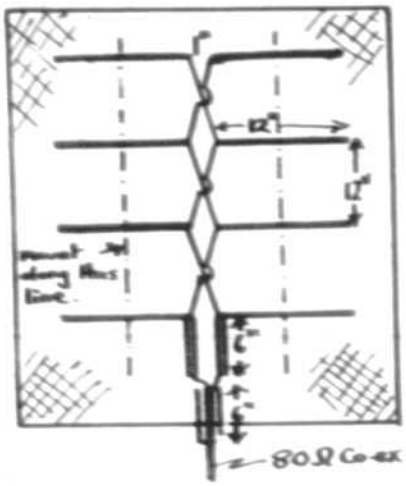
THE 1953 RSGB RADIO SHOW

This year's exhibit was intended to demonstrate how simple some of our equipment can be whilst still giving satisfactory results. In the event, it certainly did that! Unfortunately, due to pressure of exams and the like, no-one had a chance to look at G2BCB's telestill unit until the weekend before the Show, when it was discovered that a major rebuild was really necessary. As this could not be done in time, a quick telephone call to G3AST warned him that his monitor unit would not be required. G3CVO arrived at the Show with the publicity material - and no exhibits! A quick whip-around produced various units and some 70 centimetre equipment, and, through the good offices of G3AEB, the telestill unit was rushed up with G3AKJ's EHT pack, and pictures of a sort were produced in time for the opening of the Show. Some improvement was made when the neon stabilisers were removed, but still the circuit burst into oscillation as soon as any reasonable contrast was approached. Nevertheless, the construction of the unit proved of very great interest to the public. The layout of the photocell and scanner, and the relative simplicity of the time bases were a great attraction, and the negative-positive switch came in for much demonstration.

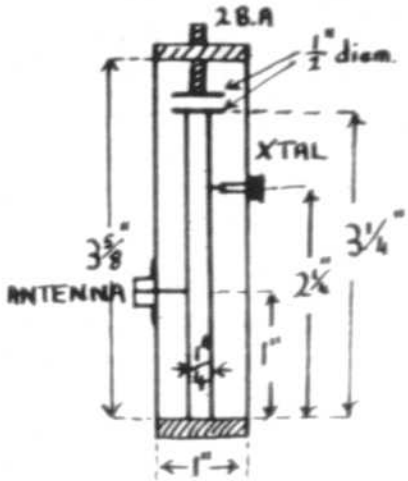
As explained elsewhere, G3AST tried to bring up the monitor in response to an SOS, but was prevented from doing so by our annual car mishap. Also on view were the 70cm converters of G3GDR and G3CVO, G2DD's being on the RSGB stand. The mixer, photocell and pulse generator chassis described in the RSGB Bulletin and in CQ-TV were also on show, plus specimen 5527 and 1849 camera tubes. We did our usual brisk business with new members, and sold all the back copies of CQ-TV to No 18. One not so bright spot was the lack of support from local members; at times there was a serious shortage of people to man the stand, and our thanks are due to Messrs. Bendall and Powell in particular for their help. It is proposed to offer a free subscription to these members for their help. Next year we hope to have a live display - this is possible every second year but not annually - and we shall require our full strength to put on a good show. In the meantime, congratulations to all concerned for an interesting, if not too inspiring, exhibit!

70 CM TOPICS

Here are details of the 70cm aerial used by G3WJ/T at Dunmow, and the converter built by G3GDR of Abbotts Langley. These two hold the present British TV DX record of 30 miles, so that the equipment is practically guaranteed!



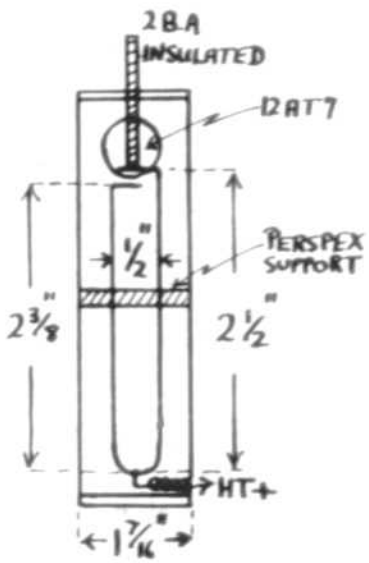
The aerial consists of 8 stacked full-wave elements with a wire-netting reflector. The dimensions are for a frequency of 436 Mc/s. The material used for the elements makes little difference; ½" Dural is perfectly satisfactory. The netting mesh should be 1", and should be 6" behind the driven elements. The matching section consists of two 5/8" diam tubes 2½" centre-to-centre spacing, 6" long; the balun (to match into 80 ohm co-ax) is made from a 6" length of brass tube, soldered to the outer of the co-ax at the lower end. The aerial is, of course, unidirectional, and has a very good forward gain. It should be mounted as high and as much in the clear as possible.



MIXER TROUGH

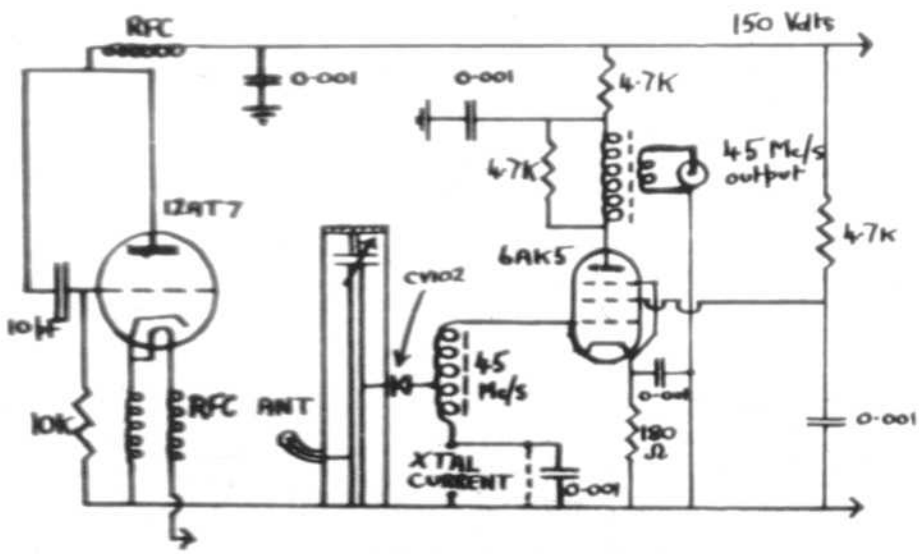
The heart of the converter - which was on view at the RSGB show - is the mixer trough. This is a three-sided trough of 1" side made of thin brass or copper. A ¼" diam. rod is bolted or soldered to one end, and this carries a ½" diameter disc. A 2 B.A rod carries a similar disc for tuning purposes. The aerial co-ax socket is mounted directly onto one side, and the trough is so mounted that the lead from the crystal to the head IF amplifier grid coil is as short as possible.

The local oscillator is also mounted in a trough, slightly larger to accommodate a B9A valveholder. The oscillator uses one half of a 12AT7, but any other similar single (or double) triode could be used instead. The tuned circuit is made of ½" wide copper strip supported by a Perspex block half-way along the trough. The frequency of operation is 390 Mc/s, and no trouble has been experienced with drift - UNDER TV CONDITIONS. Tuning is accomplished by screwing an insulated plunger into the trough, which bears upon one end of the tuned circuit strip. Coupling to the mixer is provided by mounting this trough directly above the mixer trough, so that the open sides of the troughs are facing each other. With the troughs as close as is practical, it will be found that, with a 12AT7, just the right amount of injection is available, giving about 250 microamps of crystal current.



OSCILLATOR

In the original unit, a cascode head amplifier was used, but in this circuit a 6AK5 is used instead. The IF frequency should be chosen as that of any BBC channel that can be received, eg 45Mc/s in the London area. If breakthrough from the BBC is experienced, another channel can be used. The dimensions given are for a 436 Mc/s carrier (plus or minus 1Mc/s) and a 45Mc/s IF output. The IF circuit and output co-ax must be well screened to prevent breakthrough from the BBC. The original unit was built in a 4" x 4" x 2" Alu-minium box with a lid on it, the troughs being bolted along one edge.



G3RVO

WANTED: Any 5" WHITE aluminised CRT capable of taking 9 KV. For colour work: C.Grant Dixon, 23, Wye St Ross on Wye.

Any information or suggestions welcomed.

"WHAT THE OTHER BLOKE IS DOING....."

Seems to have been some illness about this time. Frank May of Leicester has been under the weather, whilst Eddie Barrall of Colchester has also had the family ill, causing much dislocation in the TV line. Jim Russell of Bournemouth has been going great guns; a complete rebuild from the old 5527 equipment to brand new Staticon gear is complete but for the camera tube. Visitors to the RSGB show will have seen photos of Jim's very fine picture-and-waveform monitor cum camera control unit. This contains a 9" monitor, VCR139 waveform monitor, complete 405 line pulser and power units. This unit plugs into the mains, and the camera unit - quite a small affair - plugs into it. Just as simple as that. (!). Jim says that preliminary tests with the RCA amplifier described in the last CQ-TV indicated a rising response to 1 Mc and then flat to 7 Mc/s. (6db points). He is encouraged, in spite of Fluff Plowman's (Luton) misgivings; Fluff has also completed a similar unit, but not with the pulse generator integral. This is a very finely built unit also, and would have been on show at the RSGB Show but for another car accident. We seem to be plagued with them....

Tony Lobb of Croydon is modifying the 5527 camera for colour work, and has installed an 8 stage miniature video amplifier. He reports that Geoff Assenheim's (Palmers Green) camera, which is practically identical, is having a new housing and general overhaul. Colour synch units and monitors are on the way. Rex Boyer of Shefford is building a telestill scanner using two modified domestic TV units. He offers help to members in the form of a wooden tripod, a 1000 watt 3 x 3 batten of lamps, 25 w PA and gram and mic equipment. Many thanks, Rex, these offers are very kind and helpful. Robert Torrens has laid in some useful test gear, R, C and L and Z bridges, electronic AVOs etc. He offers to calibrate equipment for members. Robert has been having instability trouble in the video amplifiers, and asks for hints. The power supply is fully regulated, but an annoying picture bounce occurs as the gain is increased. This is cut down by altering the coupling components in the amplifier. (That is a good line of attack, om. See "Vacuum Tube Amplifiers", M.I.T series for cures of VLF and HF oscillations at high gain). Robert also complains that coils for true flying spot scanning tubes are extremely expensive. Our information is that standard TV deflection yokes are just as satisfactory for amateur use. Robert hopes to get TV across to Scotland next summer, but is limited in the amount of time he can spare in this season.

Two others getting Staticon tubes @ £25 are messrs Warner (Weybridge) and Worthington (Cheadle), whilst oms Vaughan (Carshalton) and Howarth (Weaverham, Ches) are awaiting delivery of monoscopes. Doug Wheele (Chadwell Heath) has been busy with exams, but is hoping to overhaul the equipment prior to building a 70cm tx and actually going on the air. Charlie Newton G2FKZ (Dulwich) has almost finished the 70cm tx to be installed at Dick Grubb's QTH at Upminster. Dick now has a live camera under construction in addition to the existing monoscope units, but is very busy with his studies. Tony Sale (Rayleigh, Essex) is back in action with a rebuilt 5527 amplifier, and is experimenting with a new 70cm converter built on the back of a 6 turn helical aerial for reception of G2WJ/T at Dunmow. Ralph now operates the TV rig by himself - no mean feat- and is shortly increasing power. G2DD (Stanmore) showed a simple tunable converter for 70cms TV at the RSGB show, being a modified version of his Short Wave Magazine CC unit. The Television Society's tx at Norwood is undergoing air tests at this time. Callsign G3CTS, freq 427 Mc/s vision. G3CVO has not had much time to do more than make an unsuccessful test with G2WJ from the roof of the Marconi College at Chelmsford. Conclusion: 150 ft of ¼" co-ax with 14 plugs and sockets en route is no way to feed a 430 Mc/s converter. Plans are in hand for putting the converter on the roof and piping down the 45 Mc/s component. G3GDR's converter is in use, the latter having built himself a new version. G3GBO has gone out to Kenya as a Signals Inspector i/c VHF multichannel gear. He has a gun, a Land

NEW MEMBERS THIS QUARTER:

Gianfranco Signiglia	IIBBE	12, Via Righi, Bologna, Italy.
Dott. Ing. Giorgio Pasquali	IIALK	S.Polo 2466-A, Venezia, Italy. Tel 23299.
Pat Lebail	F5HK	67 Rue d'Amsterdam, Paris, 8.
F.Ontigues	F4BW	E.N.S.E.H.T., 4 Boulevard Biquet, Toulouse.
Marcel Weil	F5LQ	1, Rue de l'Egalite, Mareq en Bareuil, Nord.
Alphonse Creteux	F8JR	10, Rue Chauffour, Lille, Nord.
H.S.Hughes	G4CG	3, Hill Top, Stycelewen Villas, Baglan Rd, Port Talbot,
D.Warner	G5FZC	for Vickers Armstrong Social Club, Weybridge, Surrey(Glam.
A.Colaluca		"Edina", Bretby Lane, Burton-on-Trent, Staffs.
B.S.Furby		23, Haig Rd, Cambridge.
R.G.Fielding		14, Royley Crescent, Royton, Lancs.
E.R.L.Bassett		42, Norham Avenue, Shirley, Southampton.
C.H.Young	G2AK	112, Walsall Rd, Aldridge, Staffs.
R.Turney	G8DD	37, Meadow Rd, Beeston, Notts.
P.G.Matthews		30, Ventnor Drive, Totteridge, N20.
A.J.Thorne		High St, Lambourne, Nr Newbury, Berks.
J.C.G.Gilbert		Northern Polytechnic, Holloway, N7.
J.Edward-Smith		90, Goldhurst Terrace, Hampstead, NW6.
R.G.Manser		27, Western Rd, Eastbourne, Sussex.
B.H.A.Taylor		4, Riverview Park, London SE6.
D.Hooper		42, Casselden Rd, London NW10.
S.A.Horwood		3, Brooklands Rd, Thames Ditton, Surrey.
F.Gregory		56, Queens Rd, Hersham, Walton-on-Thames, Surrey.
S.J.Hook		"The Pines", Send Hill, Send, Nr Woking, Surrey. (280)

Changes of Address:
F.E.May, 20 Whitehall Rd, Leicester; J.W.Woodfield G3HZK 77 Manchester Rd, Wilmslow, Ches, tel Wilmslow 2039; John Nettell, 256 North Hyde Lane, Southall, Middx; D.Bradford G3GBO (Kenya) c/o 9, Oxford Gardens, Denham, Bucks; E.Barrall G2BCB, 42 John Kent Ave, Colchester, Essex; R.Grubb, G3FNL/T, 1 Deyncourt Gdns, Upminster, Essex; G.Hadjipaschali, 160 Pasteur Gdns, Palmers Green, N18; R.W.Johnson, "Stonar Lodge", AMQ RAF Sandwich, Kent.

Rover, and a supply of 832s. Good luck, Don, from all of us.

Frank May of Leicester is getting both a Staticon and a Monoscope... Norman Harris enquires whether crystals can be sued instead of 6H6s in counter circuits? Ans: Most certainly; use Germanium Xtals with high front/back ratios for best results. G2BBZ has a 16mm silent/sound projector, and wants to contact someone in Hendon or N.W.London about it. Ring FINsbury 4468. How about you telecine types forming a small section? Known to be active are G3ETI (Wirral) G3BLV (Sunderland), R.H.Shepperd (WF "Balaena") G.Short (Boston) J.Adams (Iver) S.F.Hannaford (Preston). There's a nucleus for you. More questions: A.Bartholomew (Kirkaldy) asks if the radar jammer 931A strips can be used as they are. Ans: No, the coupling components are all wrong; alter to 0.01µF and 470K for a start. Will there be much HF loss in the 931A network, or should the resistors be rewired close to the holder? Ans: Don't worry about the resistors, but keep the lead from the 931A anode as short as possible. Is the VCR517c any use for scanning? Ans: I'm not sure, but I think not. Can I run the 931A from a positive line rather than a negative one? Certainly, but remember to decouple this supply extremely thoroughly, neon stabilisers preferred; remember the voltage rating of the coupling condenser too!

Finally, a well-known firm in E.London requires men to design and build pulse generators. Very good prospects. Write in confidence to the Hon Sec for details.

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