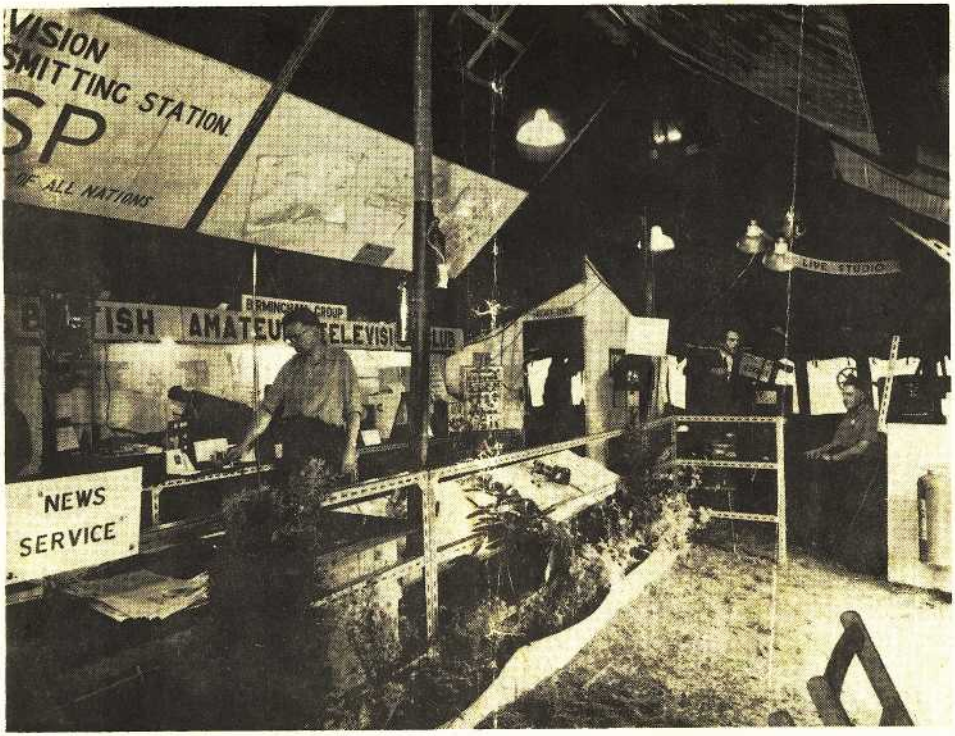

cq-tv

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A.M.Brit.I.R.E, G3CVO.

SEE YOU AT THE RADIO HOBBIES EXHIBITION

Editorial

Some members have expressed misgivings that with my departure things may grind to a standstill in the BATC. This is very flattering, but is not a true reflection of the state of the Club. We are now in our ninth year, and I'll admit that a certain amount of hard work has been put into Club activities in that time. Nevertheless the most satisfying feature of all has been the way in which members have come forward to take over the various Club and Group offices as activities have expanded. Apart from Doug Wheele and Alwyn Stockley, who have taken an immense amount of work off my shoulders, there are many of you who have formed your own groups, organised your own meetings and demonstrations - even published your own ATV journals! I think you will find that the Club will go on to still greater successes, and carry on its primary job of disseminating television information and instruction. If there are any lapses, then expect some rude letters from across the Atlantic - but I think others here will jump on you before then.

As almost exactly half of our paid up members are overseas, and consequently running negative modulation, we shall be running more features covering their requirements. As explained in the last edition, the outside four pages of CQ-TV will be done by G3EKE, and the inside four by G3CVO. This means that you should send all general items, Club notes, Other Blokeisms and photos in general to Alwyn, and technical articles to either Alwyn or me. The immediate division of labour is thus:

London Editor CQ-TV: L.A.F.Stockley G3EKE
4 Norbury Court Rd, London SW16.

Canadian Editor: M.W.S.Barlow c/o 4367 Papineau Ave
Montreal.

Chelmsford Group Secretary: John Tanner c/o 57 Second
Ave, Chelmsford.

Details of other Club services have been published in CQ-TV many times, but if in doubt a note to the Hon Sec Doug Wheele will obtain the information. During the changeover process there may be some dislocation. In particular, CQ-TV will now be despatched from G3EKE, so anyone who has not paid up will not be able to swing it in 1958! Also as the two parts of CQ-TV must be assembled at some definite time, will you please note that we shall now have to have a definite closing date for news etc, and that this will be NOVEMBER 20TH for the Christmas edition. Anything received after that will be held over. Don't forget that G3EKE is now writing the RSGB ATV column as well, so keep him in touch with your activities. It may well be that the next edition may not be up to scratch, or may be delayed, as both your Editors have a certain amount of experimenting to do, besides all our other jobs.

This business of keeping in touch is one of the bad features of Club life at the moment. I have been able to keep tabs on most things, but now it will be up to you. Group secretaries must be sure to send copies of their newsletters, lecture subjects and demonstration data to the other group secretaries. Lone members please keep G3EKE informed - and that includes photos. It is up to you now.

We have two big shows coming along: the Radio Hobbies Exhibition Oct 23-26 (a greatly expanded RSGB Exhibition) and the 1958 BATC Convention. Will you please start thinking about these now. John Tanner and Jeremy Royle are organising the first, where we think John has a winning gimmick to attract the customers. Don Reid and Jeremy have the Convention in mind - and you can be sure of a telefilm from Canada! Ideas for layouts, publicity items, gimmicks, backcloths, working models and so forth are always welcomed, but do please send them in well in advance.

And that's about it from me. Alwyn will be writing the Editorials in future, and he will be finally responsible for the shape of CQ-TV. I know you are in good hands (or believe me, after this time, I wouldn't let the old magazine go!). On a personal note I'd like to thank you all for past support, and for the many messages of goodwill and so on that Margaret and Stephen and I have received. I am remaining in professional TV with the Canadian Marconi Co, and have of course absolutely no intention of giving up amateur TV. May I remind you that sea mail takes 2-3 weeks, airletters are only 6d, and the air parcel rate is 5/6 for half a pound (that is a 5" tape spool and then a bit). I'll be at the Radio Hobbies Show to say goodbye to any of you who can get along - but I'll be back again quite soon probably, on holiday.

Cheerio,

Mike.

FRONT COVER PICTURE The Birmingham Group's stand in the GB3SP tent at the World Scout Jamboree in Sutton Park. The rack at the left contains the slide scanner; G3EJO points to a 70cm converter in front of the group's camera; the sync generator is in the corner, and G3BA operates the camera in the studio. The 16mm projector used for the daily newsreel can be seen at the extreme right. On the display stand at the front is a photicon image iconoscope camera tube for comparison with a staticon, left.

THE WORLD SCOUT JAMBOREE

The World Scout Jamboree, held in Sutton Park from August 1st to the 12th, was the first occasion on which the Birmingham Group have been asked to put on a public demonstration. Our Chairman, Tom Douglas G3BA, was a member of the Jamboree (Radio) committee and so the interests of the BATC were well looked after from the start.

Unfortunately the original marquee, 40ft x 40ft, which was to have accomodated GB3SP and the BATC, failed to arrive on the site, and one half the size had to house the complete station. Nothing daunted, Geoff Hill G3DFL/T, who was in charge of stand design, tore up his beautiful plans and set to work on the smaller space allocated to us. The result reflects great credit on all who worked so hard to erect, decorate and furnish the exhibit.

George Flanner G3KBA/T lines up the staticon camera whilst Bill Bates meets some of the Scouts.

It had been hoped originally that the Club staticon camera would be ready for the Jamboree, but this was not possible and so we had only one live camera, that of George Flanner G3KBA/T. Such was the reliability of George's equipment that we were not once, during the whole 12 days, without a live picture when needed. Also running for long periods were the telestill caption scanners, built by Messrs. Hill and Foulds. Other exhibits included a monoscope unit by Malcolm Sparrow G3KQJ/T, pulse and waveform generators by Roy Yates, and several CROs and 70cm convertors built by members. Demonstr--ations of telecine included a film, taken each morning by D.Wilson, of activity around the camps, this being processed (negative) and shown in the afternoon and evening. In addition the Club camera was on show and attracted a great deal of interest among the many visitors to our stand. We were proud of the fact that all the apparatus displayed by the BATC was home built, with the exception of three 17" monitors lent by Messrs Clydesdale.

We got off to a good start on the opening day when Lord Peter Baden-Powell came to GB3SP to record a message for subsequent transmission on the World News service; the recording was made by the BATC and his Lordship was televised during his speech. The Jamboree was a cameraman's paradise with 35,000 Scouts of all nationalities in their various uniforms and national costumes. G3KBA with Frank Rawle G3FHZ as interviewer were able to put on a most varied show at almost any time, and on more than one occasion the camp police had to ask us to close down to disperse the huge crowds. Among the scoops were the Happy Wanderers Steel Band, a Swedish accordion and dance group, and several American Indians in full war dress! A special edition of "A T Views" produced for the occasion sold some 200 copies, especially when it became known that a copy was the passport to seeing oneself on the "telly"!

Several difficulties had to be overcome. Not least of these was the presence of RF from the seven transm--itters in the tent, with their aerial farm outside. All bands from 160m to 70cms were in use almost all the time, and in the early days screened cable was much in demand. However in a short time all worked smoothly, and a great deal of experience was gained. When time to dismantle came, we were tired but happy that things had gone so well, and it was with genuine regret that we bid goodbye to the World Scout Jamboree - 1957.

- Bill Bates G3EJO.

. . . . . .

Bill sent in a copy of "A T Views" No 5; this is a special 12 page duplicated edition, "Souvenir Number". It contains a note about the BATC, details of local meetings and operations, descriptions of the gear on show, and a list of /T stations. The rear cover carried an application blank, and space for autographs (and circuit diagrams?).

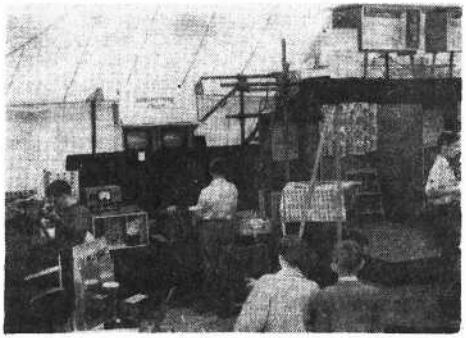
Peter Burrage, who has taken innumerable photos at BATC shows, reckons he is at last beginning to get the right idea, and offers the following pointers. First of all, the average standard lens on a still camera is too narrow in angle to permit good coverage of studios, stands, etc. Try and get a camera with a wide-angle lens. Be sure to fit polaroid filters if there are any TV screens in the picture, or the refle--ctions from the screen will spoil the result. Be sure to get some people in the picture, but not too many! If you are taking a shot of a camera, make sure you include what the camera is supposed to be looking at; don't have the operators covering up the units they are working; try and cover the general appearance of the stand (see this months front cover) and then get some action shots. And don't forget FINE GRAIN FILM!

Our printers wish to apologise for the very poor reproduction of the front cover to the last edition.
Congratulations to Ron Rew G3HAZ of the Birmingham group, who holds the 70cm world record of 497 miles with DL3YBA - steam radio, not vision (yet!).
The Hon. Sec G3AKJ apologises for some delay in correspondence that occurred after the Dagenham Show when he was taking a well earned rest.
Thanks to the Chelmsford Group members who have addressed and despatched so many CQs-TV in the past.
Drawings in this edition by Chaney, Deveson, Lilley Pegram and Barlow. Photos Burrage and others.
Don't forget to get 350 reprints of your ATV articles in other journals - you'll admit they add to the interest of CQ-TV. By the way, have you shown your copy to anyone else who might be interested?

DAGENHAM SHOW 1957

What a marvellous show this was! The biggest ever assembly of amateur TV equipment anywhere - no less than six cameras were in use, and the ancilliary gear stretched right round three walls of a 40ft x 40ft marquee.

Doug Wheele and the Southwest Essex BATC group started planning the exhibit in December, so that by



Rear wall, left of stage: Chelmsford's mixers, CCUs, effects amp. recorder and sync gen. John Tanner's vidicon camera receives attention at the left, Brian Partridge turns the orthicon on the audience (right).

July 7th the tent, tables, chairs, ladders, trestles, planks, duckboards, curtaining, stage, scaffolding, aerials, poles and electricity were all laid on. 150 beer crates (empty) were available for supporting various items, and a dozen rubber mats were laid down to prevent nasty shocks. On Thursday the 11th, Doug, with Martin Lilley, Ron Oakley and others began to construct the stage from hardboard, scaffolding and curtains, and to lay out the general U-shape of tables for the gear. Early Friday a large removal van, supplied by the exhibition organisers, went to Chelmsford, Dunmow and Bishops Stortford picking up the heavier items of equipment, whilst G3CVO and John Tanner, with others of the Chelmsford group, went directly to the grounds to lay out the already cut and labelled cables (75 total!). Fred Northwood

Right wall: G2WJ CCU, G3KKD CCU, and Matilda OB reception control. Romford's mixers and master control gear is hidden at the left.

and Ron installed the 11 17" and 21" TV sets kindly loaned by Philco, complete with isolation transformers on those modified for non-comp input at video for previewing. Another 21" set was installed 300' away in the Mayor's parlour. Jeremy Royle G2WJ/T Brian Partridge G3KOK/T and Peter Allott G3KWD arrived with the furniture van, and a race ensued to be first up with syncs - John Tanner winning by a few minutes. Brian and Jeremy were soon genlocked together and the pictures began to roll. The talkback was wired up, lighting installed, and the place tidied up. G3CVO made a quick trip back to Chelmsford to pick up three 12" Ekco console monitors for pre--view use on the Chelmsford gear - and then found that they would only accept a comp video signal. Some hasty re-routing of cables and the use of a monoscope camera as a VSB mixer enabled at least one preview and one transmission monitor to be used, but this was a snag as the image orth had no viewfinder and had to rely on the preview monitor. By 8pm on Friday, all the gear was tested and working, and the "night watchmen" began to lay out the exhibits.

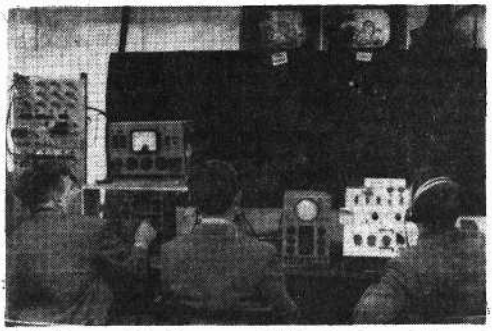
"Matilda" and the Cambridge crew were due to arrive at mid-day on the Saturday, and Ted Mitchell G8GZW and Dave assembled the 70cm. 4m and 10m aerials and checked the intercom walkie talkies. The electri-

Right of stage: Master sound and vision mixers, with three pre-view monitors out of picture, and transmission monitor at rear. Monitor at rear L is in the studio.

-city people loaned their extending tower ladder for mounting the aerials, which included a ground plane on 4m, a 10m whip, a 32 element broadside array for 70cms, a helical and a V beam for 70cms (not used but very spectacular!). When Matilda arrived, with Ian Waters and his camera as well, the BATC crew numbered some 30 people, and first pictures were on the air around 1.p.m. Mainly used were cameras 1 (G2WJ's photicon) 2 (Ian Waters photicon) and 3, (G3KOK's image orth), with inserts from Matilda (staticon). Camera 5, John Tanners vidicon, was not operating too well, having been only partially compl--eted, and 6, the G3AKJ/T 5527, was used on the Sunday. Two test card C monoscopes were available, but Martin Lilley's slide scanner was not patched into the main system. G3CVO's effects amplifier,

Some young visitors look at themselves via G3KOK/T.

together with the scan reversal switches on the image orth camera (mainly used in the studio and on the crowd) were most useful. Positive and neg--ative pictures, upside downers, and split pictures with one chap talking to himself reversed, or some--one's head on somebody else's shoulders, all went down very well. The pictures from the photicons were so good that we had to keep fading up captions to say that this was amateur TV and not the BBC! These cameras wereseveral hundred feet away by the main arena. Bill Hall had arranged full sound coverage, but this had to compete with the funfair at the back of the tent. When taking pictures from Matilda, the system was disconnected from Jeremy's RF distrib--ution unit, which then took a comp signal from Matilda; this got round any genlocking troubles. As always, the pictures from Matilda were excellent, even when on the move several miles away, due in no small part to the devotion to duty of Peter Burrage and Mike Chaney and others up the aerial tower often in tremendous showers, who kept the aerials aligned on the taxi. Unfortunately the 10m link was found to suffer from ITV, and one of the 4m walkie-talkies faded out, so Matilda could only talk to base and not vice versa.



Jack Terry, John Tanner and Mike Barlow at the Chelmsford control. From L to R: G3KOK's CCU, Peter Burrage's mains stabiliser standing on G3CVO's BATC Sync Generator, CRO, sound and vision mixers and video effects amp Preview and line monitors above.

The programmes consisted of interviews (not very successful due to high noise level) and small shows, transmissions from the arena and Matilda and so on, but as ever at this sort of show, the most popular pictures were those of the audience, with scan rev--ersals for light relief. At one time the camera nose-dived off the platform as G3KWD became really engrossed, but no damage was done.

We could have used a telecine unit during tea breaks, and a slide scanner would have saved the I.O getting captions burned on. A large number of points came up, and a tape recording was made of useful suggestions (and an excerpt from the extensive talkback system!). Much of the information on this tape would be absolutely invaluable to anyone else contemp--lating a public show of this type, and a copy can be borrowed from C.G.Dixon, Kyrle's Cross, Peterstow, Ross-on-Wye.

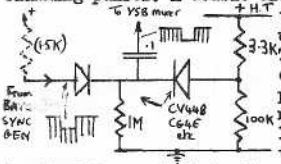
Thanks were expressed to all who took part, and a special vote of thanks was due to G3AKJ and his team for the excellent organisation which enabled everyhting to go off without a hitch.

THE BATC SYNC GENERATOR

A few points have arisen concerning the operation of the BATC Sync Generator in No. 32.

1. Vertical Jitter due to the 6.3V used to lock the vertical blanking generator, and hence the vertical sync generator, being too rounded for good triggering. Cure: increase locking voltage by using mains trans--former secondary and resistive potentiometer, or select cathode resistors of V3 and V4 with care, or replace by 2.5K w/w pots, or use a saturated core transformer (very small audio, say) to produce a spike from mains transformer secondary. When the unit is fed with a locking pulse from the counter unit, this trouble will disappear anyway.

2. Mixed Blanking output to the vision-sync-blank mixer of the type shown in No. 28 cannot be used directly, as the mixer requires constant amplitude blanking pulses. A double diode clipper as shown in the figure will clean up the pulses suitably. The diode types are not critical; adjust the potentiometer chain if necessary to clip both line and field pulses to the same level.

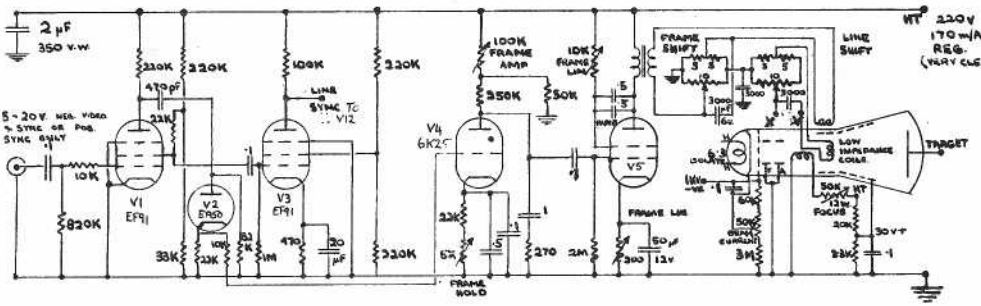


3. Mixed Sync output to the mixer is specified as being 10V amplitude, so feed the mixer from the input to V6B and not from the 1V cathode output. Failure to do this may produce uneven syncs.

4. Locking of the Test Waveform Generator of No 26 is best accomplished by taking a 10p and 100K in series from the w/f generator anodes to the corresponding blanking valve anodes. The smallest possible coupling must be used to prevent the w/f generator trying to lock the sync generator.

5. Owing to shortage of time, the timer unit has not yet been completed. It is hoped to give 405/525/625 line versions later in the year.

A MONOSCOPE CAMERA



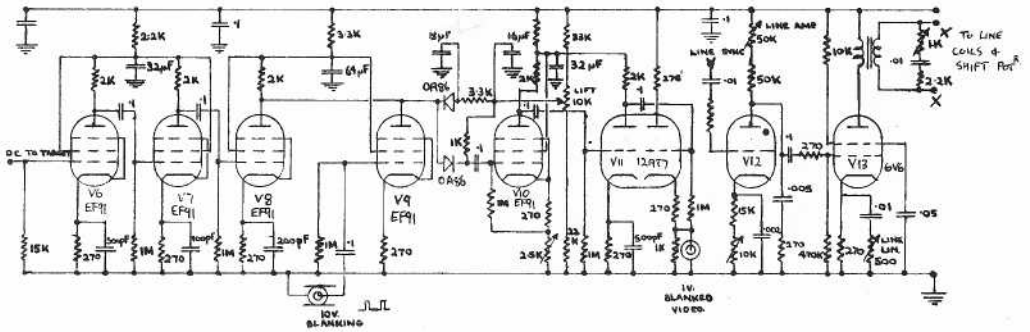
This is the circuit of the very fine monoscope built by Jeremy Royle, of G2WJ/T. Incidentally, Jeremy makes the monoscope plates for the manufacturer, so he knows what the results should be like!

V1,2 and 3 form a sync separator. Between 5 and 20V of negative video (composite) or positive-going syncs is required at the input; this is a non-standard value, but happens to fit the G2WJ/T scheme. Half a 12AT7 as an amplifier from a 75ohm 1 volt line would give the right output with a 3.3K load and 220 ohm cathode resistor, for those running BATC standard levels. V1 and 3 are EF91s, and V2 an EA50 but these types are not critical. The circuit comes from "Electronic Engineering". V4 is a 6K25 gas triode, and V5 a 6K6 field output stage. The field scan coils are AC coupled via a 3000mfd 6v capacitor, so that a 10 ohm w/w potentiometer can be used for centering. The centering supply is obtained by lifting the main HT supply negative rail from earth, and inserting the centering circuits. The latter are decoupled by another 3000mfd capacitor.

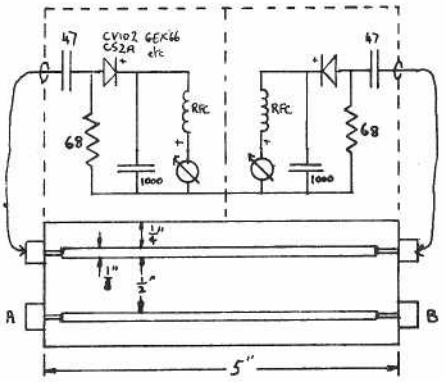
The line scan circuit is similar; V12 is a 6K25 gas triode getting its sync from V3 anode. The line output valve is a 6V6 - not much power is required for the low EHT these monoscopes use. The tube filament supply is strapped to the cathode, and is insulated for 1kV. The tube networks are straight-forward, the focussing anode being strapped to the final anode when magnetic focussing is used (the tube was rejected for poor electrostatic focussing).

V6 to V11 form the video amplifier. The values, as elsewhere, have been found by experiment to give excellent results. Another non-standard level, 10V positive, of blanking is used at V9 grid. This depresses the signal output during blanking periods and the double diode clipper cuts it off, giving a clean blanked output with variable lift. This particular circuit is the standard Vision-blank mixer used at G2WJ. V10 is a gain control stage, whilst V11 is an inverter and cathode follower. 1 volt of blanked output is available for mixing with syncs, etc.

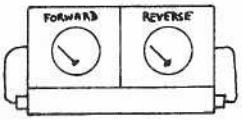
The HT supply is 170mA at 220V, and should be very cleanly regulated for best results. With the circuit as shown, over 600 lines can be resolved, with perfect grey-scale rendition and no noticeable picture noise. At G2WJ an open chassis is used, with no particular screening round the monoscope tube, but it would be better to use a mumetal shield if available, and to box in the whole unit to prevent interference pickup. The target lead should be as short as possible.



R.F. EQUIPMENT

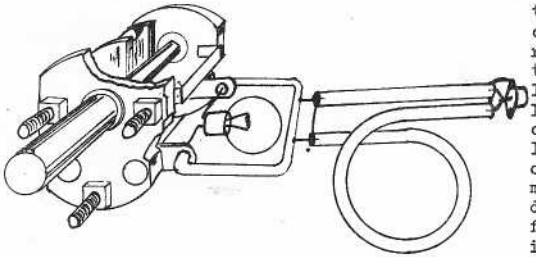


RFCs: 10t 22swg 1/4" diam



A useful item for trimming up transmitters and aerials is a standing wave ratio meter, or "Go-and-Suck Meter". This is a box showing two meters, one of which indicates power going from the transmitter to the aerial, and the other reflected power from the aerial going back to the transmitter. The unit is placed somewhere in the feeder run, and when everything is matched correctly, the Go meter should indicate a maximum and the other zero - or at least a minimum.

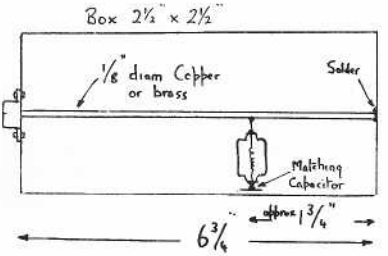
The design shown at the left is due to Tony Sale, and consists of a brass box having partition along one side; alternatively a trough can be screwed onto the outside of the box. Two co-axial sockets A and B take the feeder; they are joined by a 5" length of 1/8th diam brass rod spaced 1/4" away from the side, bottom and lid of the trough or compartment, so as to maintain a 75 ohm impedance. Spaced 1/2" away (the spacing may be varied to vary the RF pickup) is a similar 75 ohm line which feeds two identical but well screened detectors, each with a 500μA meter in circuit. The length of co-ax to each detector should be equal and enough to attenuate the RF so that the meters give a reasonable indication. If the whole unit is entirely symmetrical, it can be inserted either way round in the feeder, but in case of minor differences, for testing it would be better to use it always one way round. In this case the co-ax detector feeds could be adjusted to give more nearly equal readings if this is preferred. It is also quite possible to use one meter switched between the two detectors, but great care must be taken to screen the switch sufficiently to prevent RF crosstalk.



Tony Sale's Dummy Load

The second item is a tuned dummy load for testing the transmitter. This also due to Tony Sale, and consists of a 12V 36W car headlamp bulb with the base removed, and a tuned circuit similar to that used in the BATC wavemeter. The capacitor has 2+2 moving and 1+1 fixed plates, and the right-round length of the loop is 3", 16swg. The balun consists of two lengths of 75 ohm co-ax, one 4½" long and the other 13½" long. The inners tap onto the loop ½" apart; the outers are joined to the main co-ax socket at the main junction, and together at the loop end. If different types of bulb are used, the tapping points for the lamp leads on the loop may be different. It is always advisable to remove the base to prevent local RF heating cracking the glass. An insulated support and knob should be used, and the device will tune fairly sharply.

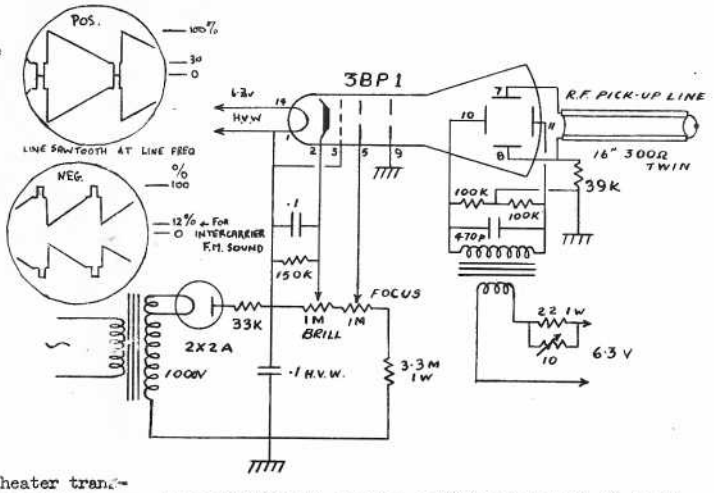
And finally here is an untuned dummy load designed by Harry Grimbergen PAoLQ. It consists of an aluminium or brass trough line with a lamp tapped on. Harry runs RG8U 50 ohm co-ax from his transmitter, but the unit will work as well on 75 ohms. The length is not critical; the lamp is a 12V 20W festoon (tubular) type - and some of them give a blue glow at 432 Mc/s, so pick a useful one. The lamp filament has considerable inductance, and this is tuned out by putting a small capacitor of about 1pf in series with it. A small brass washer about 1/2" diameter will do, and this can be bent nearer or further from the wall to tune to max brilliance. Alternatively, the lamp could be fixed to the outer wall, with the capacitor plates on the centre line. The unit will work over quite a wide passband, and has the advantage over the T.Sale load that it can be completely screened if you don't want to see the lamp lighting up!



ALYDLT

AN ENVELOPE MONITOR

Some form of monitor on the out-going RF from the station is almost essential, as this gives the only true check that all is well in the trans-mitter. Many members use a small probe and detector near the aerial feeder, and so observe the detected video waveform. It is not always easy to see from such a waveform whether the PA is really cut-off at sync bottom (pos mod) or whether peak white is really 12% mod (neg mod). A most useful addition is the "envelope monitor", which actually displays the RF envelope, as shown in the insets. Bill Still has sent in the circuit shown.



Basically the unit is a standard CRO, with the Y deflection produced by the RF output from the PA. To save building a time base, sinewave X deflection is used; this cramps the ends of the trace, but allows the relative levels to be seen clearly, which is the important thing. A small heater trans-former running backwards supplies the necessary scan volts. A 470p capacitor keeps RF off the X plates. EHT is supplied from any convenient source - the transmitter PA supplies can be used, as the EHT drain is under a milliamp. The CRT heater line must be insulated for the full EHT with the supplies as shown. Y deflection is supplied by a step-up trans-former made of 300 ohm twin feeder shorted at the outer end. The position of this relative to the P.A. tank circuit, and its exact length, are varied to produce the desired deflection. Note that any other type of CRT will require a different length of lead; the lead should be kept well away from the chassis, but may be bent as required. For really long runs of several feet a co-axial sytem would be better, but this would bring complications in the way of baluns and so forth.

If it is desired to see the correct shape of the waveform for linearity checks, etc, then a simple Miller transitron timebase using say an EF91 will be adequate. The time base is best set to display two whole fields or lines. -W2GVR/VE2/T.

THE RADIO HOBBIES EXHIBITION

At the 1957 Radio Hobbies Exhibition, to be held at the Hoticultural Halls, Westminster from October 23rd to 26th, the BATC will have a large exhibit at the left-hand end of the main hall. Present plans are for a stand some 60ft long and 10ft deep, with a studio and "Celebrity Dais" at one end, and as a special attraction, a "Tele-Phone" TV telephone. G3KOK's image orth, G2WJ's photicon and possibly a vidicon channel, with we hope t/cine and slide facilities as well, will be on view, and it may be possible to rig a glass-sided Control Room. Chelmsford are supplying much of the gear, S.W.Essex gear and publicity and staffing, and S.London gear and staff. As this is a new venture, being an enlarged RSGB Exhibition, we want a good show, so if you have any good big photos for display, or other publicity material, please contact John Tanner at 16, Norfolk Drive, Chelmsford. If you are doing a show yourselves, those Test Cards of Jeremy Royle's advertised on the back page are really superb and well worth the price.

We are still looking for the ideal sort of programme to put on at exhibitions; the R.H.E is easier to cater for as many of the visitors will be semi-technical, but could we have any ideas that you have found useful please? There are already many suggestions on the Dagenham Show tape, but I am sure others with experience of exhibitions may have some good ideas too. In passing, our heartiest congratulations to the Birmingham Group for their marvellous television newsreel kept going for 12 days. (Has this material been kept? Convention'58?).

TAPE CIRCULATION: Many members are in regular corr-espondence by tape, and in case you want to send a tape on some subject or other, here is a first list of members with recorders: Grant Dixon (Colour); M.Barlow; Ivan Howard; Bill Stapleton; Dave Hooper (staticon); John Adams (t/cine); George Flanner.

Some References:

Television Camera Channel Design: Elec & Radio Eng March 1957 (Vidicons).
Simple facsimile system for the amateur: Radio & TV News, December 1953.
An Industrial Television Channel: J.TV.Soc Vol 7 No.6.
A Transistorised Vidicon camera: RCA Review, Dec 1956.
Audio and Video on a single carrier: Electronics, May 1941.
Television Waveform Display: Wireless Eng.Sept 1951.
High Resolution FSS for Graphic Arts Color Applicat-ions: RCA Review September 1956.

Has anyone got the Club tape on telecine scanning, with contributions by G2DUS, G3KBA, J.Adams and M.Barlow please? If so notify C.G.Dixon AT ONCE.

ATTENUATORS

By Don Reid.

Before we discuss attenuators, it is necessary to know something about the unit used to express a gain or attenuation, the decibel.

The decibel, 1/10 of a bel, was originally used in audio measurements, being the smallest change in loudness detectable by the human ear. Since the ear responds in a logarithmic manner, the definition is as follows: if P1 and P2 are the intensities of two sounds then the difference in loudness, N db, is given by $N = 10\log (P2/P1)$; the logs are taken to base 10.

This definition is the same for electrical powers P1 and P2; since $P1 = V_1^2/R_1$ and $P2 = V_2^2/R_2$ then if $R_1 = R_2$, $N = 10 \log P2/P1 = 20\log (V2/V1)$. If V1 = V2, N = 0, i.e zero dbs equals no change in level. If V1 is greater than V2, N is negative, so that negative dbs represent an attenuation.

To give an idea of the size of a db, the table gives a few values of dbs and ratios.

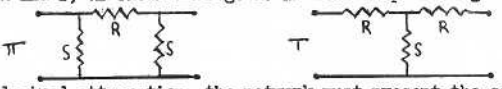
db	Power Gain	Votage Gain
0.1	1.02	1.01
1	1.26	1.12
3	2	1.41
4	2.5	1.58
6	4	2
10	10	3.16
100	10,000,000,000	100,000

The db notation is very convenient as the dbs are merely added, and no multiplications are involved. Also as many circuit elements behave in a logarithmic manner, the db is a convenient unit, i.e the response of a simple RC coupling falls off at 6db per octave.

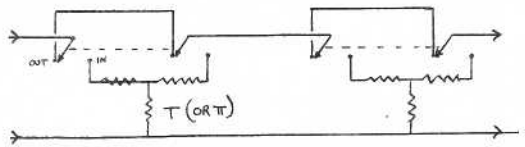
A simple rule for finding the approximate value of the voltage gain from a db ratio of N is to find $2^{N/6}$. E.g if N = 18 dbs, N/6 = 3, ratio = 2^3 = 8 times.

Attenuator Networks

There are two networks of practical use, in which one side of input and output is earthed; these are the π and T, as shown in Fig. 1. As well as providing the desired attenuation, the network must present the same input and output impedances. The values given below are based on a nominal impedance of 75 ohms, so that the attenuator can be placed anywhere in the ATV system without mismatching the cables.



If the attenuator is to be switchable, a 2p 2w t toggle switch can be used to short out the resistors, as shown in Fig. 2.



Practical Layout

It is important to mount all the resistors and switches in a completely screened metal case, with proper co-ax connections, if the attenuator is to be used up to say 60Mc/s. Above 100Mcs, by the way, the dbs obtained will depend on the physical construction of the resistors, due to RF effects. A compartment size of 1½ x 1½ x 2½ should be adequate; brass is best used to obtain a good earth. The table gives values for useful dbs using standard resistors; naturally the closer these are to the indicated value the more accurate will be the attenuation. Both π and T are used to avoid awkward values.

T Networks

Nominal dbs	2	3	5	10	dbs
R nearest	10	12	22	39	ohms
S nearest	330	220	120	56	ohms
Impedance	81.8	73.6	75.9	76.7	ohms
Exact dbs	2.14	2.88	5.18	9.7	dbs
R exact) for Z	8.60	12.8	21.0	39.0	ohms
S exact) 75 ohms	325	212	123.4	52.7	ohms

π Networks

Nominal dbs	1	6	dbs
R nearest	10	56	ohms
S nearest	1200	220	ohms
Impedance	77.3	77.4	ohms
Exact dbs	1.12	6.07	dbs
R exact) for Z	8.62	56.3	ohms
S exact) 75 ohms	1300	225	ohms

Theory

The basic design formulae are:

T: $R = Z(K-1)/(K+1)$ and $S = 2ZK(K^2-1)$

π: $R = Z(K^2-1/2K$ and $S = Z(K+1)/(K-1)$.

where Z is the required impedance and K is the required voltage ratio NOT in dbs.

Reference

"Attenuators for High Frequencies" R.F.Privett, Wireless World, March 1954 pp 141-145 - very good.

VIDICONS please note that application forms for vidicons (either scheme) and monoscopes are obtained from Don Reid, and that he has changed his address to 27 Rose Valley, Brentwood, Essex.

In view of the fact that all the executive members of the BATC except G3AKJ have changed their addresses in the last few months, please be very careful about addressing your letters. Here is an up to date list:

Chairman: C.G.Dixon MA, Kyrle's Cross, Peterstow, Ross-on-Wye, Herefordshire.

Secretary: D.W.Wheele AMIEE G3AKJ 56 Burlington Gdns, Chadwell Heath, Essex.

Ed and Treas: LAF.Stockley G3EKE 4 Norbury Ct Rd, London SW16.

Asst. Sec: Don Reid B.A 27 Rose Valley, Brentwood, Essex.

OVERSEAS MEMBERS: Have YOU got your lapel badge? These are black diamond-shaped, traced in gold, carrying the BATC badge as shown on P2 top. Price 3/6 or 50c from G3EKE 4 Norbury Ct Rd, London SW16. With your callsign 5/- or 75c. IDENTIFY YOURSELF.

WHAT THE OTHER CHAP IS DOING

Yeovil Amateur Television Society have suffered a severe setback. The room above the clubroom was used by a firm doing motor rewinds, etc - and their wax dip bath caught fire, cascading burning wax everywhere. Heavy machinery came down through the roof, and all the TV gear was destroyed, plus Alan Stacey's complete tape library, all his books, CQs-TV, and so on. Fortunately the 5527 was at Alan's house with some valves and HiFi gear, also John Plowmans own equipment is safe, but the boys would like help to rebuild their CQ-TV library. Write to G3AST at 4 Hewish Farm Cottages Bradford Abbas, Sherborne, Dorset.

G.S.Chatley G3LOS/T (Enfield) now has a G8SK type transmitter running on 436Mcs, according to the June issue of the Lea Valley Reflector. This issue also carries details of a maodified G2DD converter very suitable for ATV reception. Ted Mitchell G3GZW at Basildon has been very active behind the scenes. A leading light in the Chelmsford BATC net on Sundays, Ted has also presuaded D.Jones and "Bash" to join the BATC; the latter is now G3LVL/T and is at Laindon, the highest spot in Essex. Frank Brown is now G3LUS/T at Romford, so the TV activity in SW Essex is going up rapidly. G5KG at Danbury hill has been fitted up with a TV converter by G2WJ, and already has some very good 70cm communications gear. Although not a TV man, George is always willing to look for pictures - ring him at Danbury 504. Ian Waters G3KKD/T (Ely) has decided to scrap the old photicon camera, used for its final show at Dagenham. He and Jeremy Royle have the only two cameras left in the country which use this type of photicon, and there are now no more spare tubes. Both are now thinking of vidicons.

Mike Cox (Beccles) has just been married (con--gratulations, om) and is therefore moving house prior to joining Bell in Canada. He has been miniatu--rising some of the pulse and CRO gear, and also playing with transistor circuits. Peter Burrage has had his 3cm 723A/B TV link running with video,

Back in the spring, the Cambridge group visited Chelmsford, and this happy group was taken by G3IZI whilst another transformer burned away...

but initially the go and suck horns have had to be practically touching! Roy Martyr has built the EHT and time bases for his FSS unit, using a 5ZP16 tube.

Bill Stapleton (Dublin) and others suggest the use of slow scan TV on the HF amatuer bands for contacts across to Canada and so on. Any takers? Bill has given up the TV recording on tape directly in favour of a carrier system as advocated by George Flanner. This does mean of course some modification to the tape recorder. Howard Phillips (Tulsa) has been W5AN since 1920, so he rates with G2WJ amongst the old timers. He is now with KVOO-TV. Buz La Bonte (Auburn, Calif) K6KDU-TV is 35 miles NE of Sacramento and 1800ft asl. He reports that in 1950 W6VSV-TV was received over a 100 mile path, and asks if this is a record. (As far as we know, yes). His own gear consists of a 5527 ike, a 6 stage video amp; the CCU uses about 23 tubes, and provides shading etc. 4 volts of output (why on earth FOUR, om?) is fed to the modulator, which consists of 6AG7 -6AG7 into two 807s in parallel to modulate the 4X150A PA. At present the peak input is 50W, this being the legal maximum, but Buz will run to 200W peak Sync when the ban is lifted. The antenna is a twin stack Yagi, with vertical polarisation. A tele -cine unit has been made from an RCA type ATJ camera, and the resolution is in excess of 500 lines. Some photos of the gear and results are on their way.

Ron Bassett (Southampton) writes with news of the activity there: the staticon camera works well now, and is fitted with an f1.9 lens focussing from 2ft to inf. The pre-amp started as a 6AK5, then an EF91, and is now an E180F. He uses cathode and top peaking to give about 25dbs boost at 5Mcs relative to 10kc/s, but wants about 46dbs. He asks for circuits used by other people (send them in, men). Distribution of the signals is on Channel 5, using a 6AG5 ECO and EF91 grid mod. A very succesful demonstartion was given on July 12-13, and Ron is now collaborating with a local ham for a combined /T effort. J.G.MacIver VK4JE has started a group in Brisbane with VK4HR and VK4MO. A Vidicon is on its way under the club scheme. VK6EC is soon to start some ATV articles in "Amateur Radio", we hear. Arthur Critchley (Lytham St Annes) knocked up an FSS using a 5FP7 and 931A for a show in Manchester; with five stages of amplification using 6AG5s and 1K loads he obtained 2.5Mcs definition easily. The staticon tube has been tested OK and Arthur is now at work on the camera proper. Peter Jones GW3FPF hopes to receive Bill Stapletons TV signals at Rhyl.

Brain Partridge G3KOK/T forgot to interlock the HT and LT switches on the power packs, and burnt all his mains transformers out two days before the Dagenham Show - the mains fuse was 10 amp instead of 2 amp! The camera chain will be on show at Harlow Rally (Sep 1st) and Enfield Show (21st) and the Radio Hobbies Exhibition (Oct24th onwards). Brian is still trying to find time to finish the viewfinder.

Cliff Sunderland VE2CB visited G3CVO for a hectic 24 hrs. 160m QSOs with some local BATCs were followed by a 4 hr visit to G2WJ to see some REAL pictures. Cliff was suitably impressed by the thatched cottage too - so now G3CVO will have some support in Montreal for the Tall Stories about the BATC results! Bill Still W2GVR/VE2 and the MARC boys tried an OB from the local mountain back to the clubroom, but the first try was not successful. Some useful publicity was obtained from an interview carried by the local radio network. Montreal now has 4 image orthicons, which are obtained surplus from local TV stations.

Frank Rawle G3FHZ has been elected Hon Sec of the

Midlands group of the BATC. He reports that the group camera is held up for lack of a fiver or so, but that George Flanner's works a treat, and has been used for several public demonstrations.

Some well-known BATC faces appear on this photo taken at a Chelmsford meeting: Standing, l-r: Don Reid, Eric Lawley, Arthur Butcher, Jim Chalwin, Roy Martyr, Brian Partridge, Mike Barlow, two visit-|-ors; front: Ivan Howard, Bob, and Peter Allott.

Max Benyon is now home in Sydney, NSW, complete with FSS and "lots of unobtainable gear", so any VK members in the area are invited to contact him, address in box above. Charlie Coorsh VE2AFM (Outremont) runs an 1846 ike on a rigid tripod; a 10" monitor and the rest of the gear is rack mounted, the PA being an AX9903 (QQV06/40 in English). The sound FM carrier is offset 4.5Mcs, uses an 832A PA, and is combined with the vision in a diplexer. (Details, pse Charlie). The shack is superb - acoustic tiles on the ceiling, rubber floor, ribbed plywood walls, concealed lights. Charlie also has a 1956 Chrysler, a motor boat, a country cottage... and a bottle of Cherry Brandy in his shack bar waiting for G3CVO/VE2! Tony Bannister writes from Johannesburg that he and four others are starting up the JATC, with Tony's 5527 camera for a start. Sam Liff is also in, and between them they have four camera tubes and several TV receivers. Good luck men - we hope to hear great things from you, especially as other activity in S.Africa seems to have died away.

C.A.Rouse (Auckland NZ) says the closed circuit gear is running very well, and the transmitter will be on the air very soon (vision 96.4 Mcs, sound 99.9). For 16mm work they have a Bell and Howell 620 project-|-or, with the shutters removed and speeded up to 25 pps (See G2DUS report on use of unmodified projector). The projector is not synchronised, and points straight at the staticon. A 4" enlarging lens, and crossed polaroids to control the light, gives good results with a wide range of films.

John Jull (Cambridge) has passed the GPO exam and awaits the /T; already the group has received 99+ TV signals from G2WJ (25m). Visitors to Dagenham will have seen the very neat job made of the new staticon camera. John Watts (Clevedon) is with the Bristol Aircraft Co and has been installing TV units in Britannias; he hopes to persuade them to try CTV to watch flame exhausts etc! John's CPS camera tube has died, and he hopes for another or an I.O. Mike Sendecky (Toronto) was under the impression that there was NO activity in Canada. He is 17 and awaiting his ticket.

I1BBE writes to say that the Italian amateurs have not been given permission to go on the air because of possible "crowding of the frequencies, danger of harmonic interference to links above 900 Mcs, and the patent right to transmit TV is invested in the R.A.I official stations"!! Really, are all licencing officials so totally ignorant of technical facts? Old BATCs will remember we had the same trouble here in the UK at first.

Eric Cornelius VK6EC sends in a long letter full of news from Australia. He says that although Len Moncur had a 5527 running first, ATV trail-breaking seems now to be left to himself. Eric has published a series of ATV articles in "Amateur Radio", and hopes shortly to start a regular column in that journal. As far as Eric knows, the only cameras there are those of VK3LN, VK4JE and VK6EC and VK6WJ in Perth. Another 5527 is going the rounds too, being at the moment with Arnold Cook at Kellerberrin.

NEW MEMBERS

Name please	Glenbrae, Greengraves, Newtownards, Co. Down, Eire.
D.Bellsham	20 Ennerdale Ave, Elm Park, Hornchurch.
P.W.Brown	15 Narborough St, Fulham SW6.
V.Burnell	30 Mirion St, Guelph, Ontario.
D.W.Glaxon	211 Breck Rd, Wallasey, Ches.
J.Deveson	c/o Chelmsford Group
T.Douglas G3BA	141 Russell Bank Rd, Four Oaks, Sutton Coldfield, Warks.
C.Edgcombe	c/o Chelmsford Group.
A.A.Green	1 Corona Villa, Boundary Rd, Wooburn Green, Bucks.
R.Hopwood G3LTC/T	81 Dalston Dr, E.Didsbury, M'chester.
G.D.Judd G3LUE/T	317 Baker St, Enfield, Middx.
N.Kay	2710 Manning, W. Los Angeles, Calif.
I.Lasher K2PWL	171 Linwood Ave, Buffalo 9, N.Y.
J.C.MacIverVK4JE	21 Hurd Tee, Morningside El, Brisbane.
I.C.MorrisonVK4MO	46 Aaron Av, Hawthorne, Brisbane.
J.W.Pendlebury	Flat 11 Holford Cres, Knutsford, Ches.
H.W.PhillipsW5AN	4813 E. King St, Tulsa 15, Oklahoma.
L.Rota	Apartado 414, Quito, Ecuador.
H.Scholy VK4HR	95 Stephens St, Morningside, Brisbane.
M.S.Sendecky	121 Pearson Av, Toronto 3, Ontario.
M.R.Soames	41 Henson Rd, March, Cambs.
W.Still W2GVR/VE2	4567 Papineau Av, Montreal, Que.
R.Tebbutt	11 Revel Rd, Wooburn Green, Bucks.
J.Vicente PY2AUC	Caixa Postal 764, Est. de S.Paulo, Campinas, Brasil.
P.W.B.Watson	Woodbine Cottage, Main St, Lowdham, Notts.
R.Wickham	34 Gledwood Ave, Hayes, Middx.
F.W.Worthy	37 Alexandra Ave, Sutton, Surrey.(589)

Changes of Address

M.Barlow G3CVO c/o Cheyne Cottage, Dukeswood Drive, Gerrards Cross, Bucks (after Nov 1st); J.M.Benyon 87 Redmyrne Rd, Strathfield, N.S.W, Australia; F.Brown G3JQP 49 Natal Rd, Ilford, Essex; G.Cleveland c/o 30 Melville Rd, Barnes SW3; J.A.Jull 73 Montague Rd, Cambridge; F.Lee G3JVO/T 11 Abbey View Rd, St. Albans Herts; F.Northwood 14 Newbury Gdns, Harold Hill, Essex; D.Reid 27 Rose Valley, Brentwood tel 2056; P.J.Robinson G3KFH/T 46 Hillview Rd, Worthing, Sx; G3EKE/T is now on the phone at home at POLlards 8404.

VK6WJ has a staticon, in very good condition with two minor spots. Activity started in 1953, but as he is due to be married about now (Congratulations, om) shortage of time has prevented one or two needed overhauls. VK6EC's staticon is covered in spots, some as large as 3% of the picture width in diameter. 350 line resolution is available at the centre, and the linearity is good except for a bit of foldover at the left, only visible in the viewfinder as normal blanking masks it. The viewfinder is a 5FP7, and the lens turret carries 3/4", 3" and 4" lenses. The camera is on a dolly type tripod, with Shepherd ball bearing castors, spring compensated pan and tilt head, and with a tilting type compensated viewfinder hood. Camera control has another 5FP7, and a VCR139A for waveform monitoring. Gamma, setup, H and V shading and sync and blanking mixing are done here. The video mixer uses electronic mixing giving 3 speeds of mix and fade, and cut. All four channels can be previewed, as well as "On the Air". A 12" VCR140 is used as the main monitor, with 2 5BP1s as line and field w/f monitors with CCIR Y-amp roll-off. The sync generator has been running since 1954 giving a standard 625 line CCIR waveform.

VK6WJ/T has been running about 2.5W output from a QQE03/12 on 288.5Mc/s, screen modulated by a 6AG7: VK6EC/T uses a 6AM6 tritet from a 10.75Mc/s crystal, then a 5763 tripling to 97Mc/s, a QQE03/12 tripling to 290Mc/s followed by the PA on 290.25Mc/s, another QQE03/12. These tubes are 37/6 each compared to £11 for the QQV06/40 in Australia. With 220V HT, Eric puts 4 watts into a lamp load. Sound is to be injected into the vision modulator on a 5.5Mcs subcarrier, as is done by the VE boys.

Eric points out that TV conditions in Australia are quite unlike those in Europe; he and Warren and a couple of viewers are the only TV people for about 3000 miles, so all-round coverage of the town, and not a beamed DX transmission, are the order of the day. The /T permit is free in Australia, hence the very large number of inactive /Ts in the country! A TV receiving licence costs £5, radio only £2 and a transmitting ticket is only £1 per year.

Thats it for the 8th year running; nice to have received all your more or less legible letters, hints, queries and complaints, etc. Be sure and support the New Scribe, and get your latest news in to him at 4 Norbury Court Rd, London SW16 tel POLlards 8404 by NOVEMBER 20TH AT THE LATEST. This is your column, so please keep it going. 73 Mike.
Go on - put a ring round Nov 20th on the calendar NOW.

AROUND THE CLUBS

SOUTH LONDON held no meeting in August, but activity has continued. It is hoped to have the camera chain complete by Christmas. G3EKE/Ts tx is now complete, and he and G3LCM/T will be on 441 Mcs vision, 437.5 sound, the group frequencies. The 5527 camera of G3LCM has been running, and Messrs Waspe and Harris are supplying the pulse gear. Monthly meetings are held at 4 Norbury Ct Rd, details from G3EKE.
CHELMSFORD have given two demonstrations since the Dagenham Show, at Harlow and Enfield. Work is now in hand for the Radio Hobbies Exhibition. Lectures recently: "A 3cm microwave link" (P.Burrage),"BATC Wrinkles"(G3KOK) "Some new Colour TV Ideas"J.Terry and "Clippers and Clamps" G3CVO. Meetings 2nd Thurs in each month, 1980kcs net 1100 Sundays.
Hon. Sec J.Tanner c/o 10 Baddow Place Ave, Gt. Baddow.
HIGH WYCOMBE have slowed up production due to the holidays, but the camera progresses. As a result of visits from J.Terry and G.Dixon they have now found that the target connection to the staticon is at the front of the tube! W2BPO was another visitor. Meetings Monday nights at Hayreed, Gallows Lane, Sands, High Wycombe, home of Hon Sec Ken Cooper.
BIRMINGHAM have now recovered from the Scout Jamboree and are resuming monthly lecture meetings at the White Swan; the AGM was on Sept 11th. The cash is now to hand for the Club camera. Hon Sec F.Rawle 16 Kings Rd New Oscott, S.Coldfield.
MONTREAL have had a preliminary meeting attended by 10 members. Regular monthly meetings will be laid on this autumn; 4 I.O cameras are in use. Write Bill Still at 4367 Papineau Ave, Montreal for details.
S.W.ESSEX resumed their meetings on September 18. As a result of the Dagenham Show the membership is now much larger, and includes four /Ts. Work is in hand on two cameras, and the extras. Hon Sec Martin Lilley 25 Netherpark Drive, Romford.
