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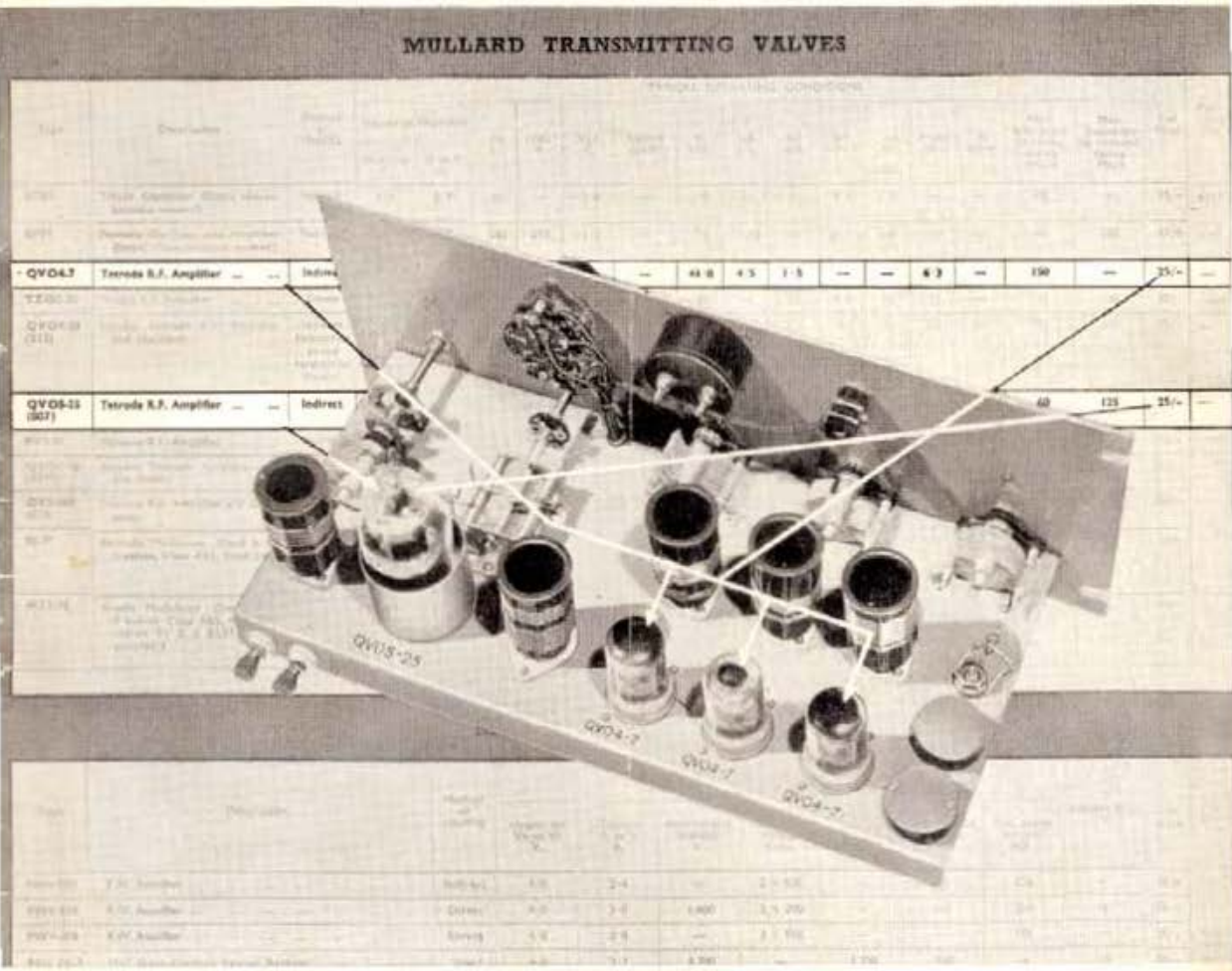
BULLETIN

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN



- TELEVISION INTERFERENCE
- RADIO AMATEURS' EXAMINATION —HINTS TO CANDIDATES
- TOP BAND AND FIVE METRE CONTEST RESULTS

R.S.G.B. BULLETIN

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VOL. XXIII — No. 9

TELEVISION INTERFERENCE

The Present Position

THE general problem facing the owner of an amateur transmitter who is situated near to a television receiver was referred to in our September Editorial. In that issue we asked for details of known cases of interference to be reported in detail, together with any steps, successful or otherwise, which were taken to overcome the trouble. The number of such reports received has been disappointing in the extreme, although the few which have arrived have provided some very valuable information.

Although we are not, therefore, in a position to present the summary of the situation as we had intended it is felt that some of our recent thoughts on the present position are worth recording.

How much interference does the amateur cause ?

First let us look at the magnitude of the problem. The Engineering Department of the G.P.O. analyses the cases of interference with which they deal, according to the nature of the source of interference, under the headings of sound and television broadcasting respectively. We have been provided by the Radio Branch of the Engineer-in-Chief's Office with the figures for February and May to September, inclusive, of 1947, which show the following interesting facts.

During these six months, the monthly average number of cases investigated of interference with television reception was 51, of which 9·3, or about 18 per cent., were traced to amateur transmitters. It is also interesting to note that in the case of sound broadcasting the average number of cases was 1,847 per month, of which 29·3, or about 1·6 per cent., were due to amateurs.

Thus, although the total number of cases of interference experienced from amateur transmitters to television sets is only one third of that to ordinary broadcast sets owing to the much greater numbers of the latter, it is clear that the television receiver is much more prone to such interference.

The figures are not classified according to location, but as is to be expected, our own reports indicate that most cases of interference occur in the fringes of the nominal service area where the field strength from Alexandra Palace is getting low.

Can the receiver be blamed ?

The most significant question to ask in any given case is this. " Is the interference due to the radiation by the transmitter of frequencies in the television band ? " If the answer is " Yes," then, theoretically at least, it should be possible to reduce the trouble by attention to the transmitter, about which we shall have more to say presently.

The answer to the above question may, however, be negative, in which case the remedy must be applied at the receiver. We have had several cases brought to our notice recently in which the receiver was put out of action due to radiation from the transmitter *of frequencies authorised by the amateur licence*. For example there are some superheterodyne receivers which have a local oscillator operating at 37 Mc/s. and an I.F. amplifier centred on 8 Mc/s. The second channel image frequency is therefore 29 Mc/s.—right in the middle of the 28—30 Mc/s. amateur band ! The selectivity of the R.F. circuits is inadequate to deal with the high field-strength of this frequency to which a local amateur transmitter may quite legitimately subject it. The most satisfactory solution in such cases appears to be the insertion of a high-pass filter in the receiver aerial circuit, which will provide a high attenuation between 28 and 30 Mc/s. whilst offering negligible attenuation and phase distortion within the television band from 41·5 to 48 Mc/s. Such a filter is described by Mr. P. Cundy in an article which appears elsewhere in this issue.

Some types of receivers which have I.F. amplifiers covering the 7·0—7·3 Mc/s. amateur band appear to have a certain amount of unscreened wiring between the mixer anode and first I.F. grid and although this may be only short, we wonder whether it may not pick up sufficient energy from a 150 watt transmitter next door to cause trouble. Other types with I.F. passbands which include the 14 Mc/s. band may also be liable to such interference.

In these, and other similar cases, we must look to the receiver manufacturer to put his own house in order and readers will be pleased to hear that such features of receiver design have already been brought to the attention of the *British Radio Equipment Manufacturers' Association* and we have every confidence of their co-operation.

Before leaving this question we should like to refer to another related matter which may be more the concern of the dealer than of the manufacturer. It has been brought to our notice in several cases recently in the London area that a dealer may demonstrate to the customer that a perfectly good signal can be obtained using a quarter wave of wire fixed indoors to the wall, or some other extemporised aerial system. This state of affairs continues until the local amateur transmitter goes on the air, when considerable interference generally results. In most of the cases the fitting of a proper dipole aerial in a suitable place with a correct feeder system as supplied by the manufacturer has resulted in interference-free reception.

Unauthorised radiation from the Transmitter.

Before any of us begin to feel a little self-righteous in this matter, however, let us turn to the other side of the picture. Can the transmitter radiate any energy *outside* its licensed frequency bands, and if so, are these radiations likely to interfere with the television service. On page 171 of this issue will be found an article by Mr. L. Varney in which are tabulated the harmonics of all the amateur frequencies which fall within the television band.

The present 14 Mc/s. band and the future 21 Mc/s. band are the most dangerous, as low order harmonics of the output stage will fall within the legitimate response band of the television receiver. Any efficient class C amplifier is bound to generate harmonic anode currents of these frequencies and there is nothing but the anode coupling circuits to prevent them from reaching the aerial system itself, which in many instances may be an efficient radiator at these frequencies.

Mr. Varney publishes details of a harmonic rejector, for use directly in the P.A. anode circuit, which gives a great measure of reduction of output at the third harmonic frequency. In our view some such device should be incorporated as a matter of routine in all 14 Mc/s. transmitters (and on 21 Mc/s. in due course) operating within 100 miles of London.

Similar circuits will be necessary on appropriate frequencies in other parts of the country when the new television transmitters come into service. Suitable designs for harmonic rejectors for use in aerial feeders have already been described in the *Amateur Radio Handbook* and these can be used in addition, with advantage.

When working on the 28 and 58·5 Mc/s. bands, interference not infrequently occurs due to radiation of harmonics from the 14 to 28 Mc/s. doubler stage. This should always be well screened and coupling links to separate P.A. stages should preferably use co-axial cable with the screen well earthed to the chassis at each end. In our own case, we have found 43 Mc/s. energy being radiated from P.A.'s working on 28 Mc/s. and 58·5 Mc/s. even when such precautions are taken and it appears that with modern high gain valves a P.A. tuned to 28 Mc/s. or 58·5 Mc/s. may still have sufficient gain at 43 Mc/s. to pass enough energy through to the aerial circuit to cause interference.

How much harmonic reduction is necessary ?

The almost complete absence of other transmissions on frequencies near that of the London Television Station encourages the installation of receivers at distances of 50 miles or more, which, given a good aerial, are capable of producing a very satisfactory picture in the absence of interference. If there exists a 14 Mc/s. transmittor in the vicinity, however, the smallest trace of third harmonic will make reception quite impossible. The technique of harmonic reduction has been studied and practised extensively in certain parts of the country which fall within this category, with results which are often far from successful.

It is sometimes instructive to examine such problems quantitatively and we will now consider a hypothetical case of a television receiver at 50 miles from Alexandra Palace and only 50 yards away from a 14·4 Mc/s., 150 watt transmitter. As frequently occurs in practice, we will assume that this transmitter is in line between the receiver and London, so that there is little to be gained by the use of directional receiving aerials in this connection. Then the value of the third harmonic current on 43·2 Mc/s. in the local transmitting aerial circuit which will produce a signal in the receiving aerial equal to that produced by the television transmitter (assuming for simplicity that both signals are received over an optical path) will be 1/1760th of the current in the television transmitting aerial. Again, for simplicity, we have assumed that both transmitting aerials have the same power gain. To prevent serious interference let us suppose that the interfering signal must be not more than 10 per cent. of the required signal. Then the harmonic aerial current must be reduced to 1/17,600th of that in the television transmitting aerial. The peak power in the London Television station aerial is 17 kW. Therefore the harmonic power in the local transmitting aerial must be $\frac{17{,}000}{(17{,}600)^2}$ watt or 0·059 *milliwatts*.

Therefore, if the local transmitter has an aerial power of 100 watts on 14·4 Mc/s. the harmonic must be 62 db. down on the fundamental. The true picture may be much worse than this, in that the figure of 17 kW. relates to peak power, and the 100 watts is carrier power which may be fully modulated, and also the local transmitter may be using an aerial with a higher power gain than that used at Alexandra Palace. Further, although there will certainly be an optical path between the receiver and the local transmitter, it is certain that this will not be the case for Alexandra Palace, which will reduce the received signal considerably. Against this must be granted that the receiving aerial will be vertically polarised, whilst the local transmitter will probably be using horizontal polarisation.

These figures are exceedingly rough and are subject to numerous unpredictable errors, but it can safely be assumed that a harmonic reduction figure well in excess of 60 db. must be achieved in such locations.

How does this performance compare with that demanded of modern commercial equipment ? The C.C.I.R. regulations ask that the harmonics from transmitters using low powers, such as amateurs use, shall be not worse than 40 db. down on the fundamental. For high power stations not more than 200 milliwatts is permitted. At a power of 20 kW. this corresponds to 50 db.

So that the amateur, with his limited knowledge and equipment is expected to better the performance of his professional colleagues by factors of 10 to 20 db. if he is not to cause interference in " fringe " areas !

In this connection it must be remembered that the amateur is gregarious and naturally tends to live in centres of population in close proximity with television receiver owners whereas most commercial radio stations are sited away from towns. Furthermore a commercial transmitter is often permanently installed under one set of known operating conditions, which permits the use of elaborate filters which can be individually adjusted to maximum harmonic rejection.

The amateur usually attempts to justify his existence by experimental work which demands continual changes in design of equipment and operating frequency. How much more difficult then may his task be than that of the designer of a commercial station ?

The problem of the " fringe " areas.

Where transmission is required on the 28 or 58·5 Mc/s. bands in these areas it seems to us that the master oscillator, whether crystal or V.F.O., should operate in the region of 5 Mc/s. or 10 Mc/s., so that the required frequencies in the 28 and 58·5 Mc/s. bands can be obtained by the use of a tripling stage for 10 to 30 Mc/s., thus avoiding the generation of any frequencies near 15 Mc/s. and hence harmonics in the 45 Mc/s. band. This is known to have enabled completely interference-free operation to be obtained in many cases. Unfortunately it cannot solve the

(*Continued on page* 175)

CURING AMATEUR INTERFERENCE TO TELEVISION

By LOUIS VARNEY, A.M.I.E.E., (G5RV)*

THE reduction of interference to broadcast reception is an important aspect of Amateur Radio. Provided that the transmitter is carefully constructed, and reasonably free from harmonic or other spurious radiations, and that the nearby broadcast receiver is reasonably selective, the cure for such interference is relatively simple. Nowadays, however, amateurs are faced with a rather more difficult problem—the prevention of interference to television reception. In view of the rapid increase in the number of television receivers in use, and the projected Regional Television scheme, this problem is likely to confront an increasing number of amateurs in the near future.

The writer first commenced work on the problem in 1939, and the information which follows comes mainly from observations made whilst clearing interference to two nearby television receivers in the Chelmsford area, approximately 27 miles from Alexandra Palace.

Although tests were still in progress when this article was being written, with a view to proving the general efficacy of the method described, it is hoped that the information presented will be of assistance to other amateurs in the meantime.

Harmonic Radiation by Amateur Transmitters

Sound transmission from Alexandra Palace takes place on 41·5 Mc/s., and vision on 45 Mc/s. Both are normal amplitude modulation systems, but, owing to the wide range of modulation frequencies which must be transmitted to reproduce the picture, the sidebands occupy a relatively wide spectrum. The sound channel has a band width of ± 15 kc/s., and the vision ± 3 Mc/s. approximately. For this reason, the television receiver must have a broad frequency response, and this, unfortunately, increases its susceptibility to interference from amateur transmitters. This interference takes two major forms, (*a*) harmonic radiation from the transmitter, and (*b*) local "break-through" produced by the fundamental carrier wave. With regard to (*a*) the most serious interference is likely to result from the third harmonic of a 14 Mc/s. transmission, which falls directly in the television band. Table I shows the fundamental and significant harmonic frequency range produced by a transmitter operating in the various amateur bands. The 21 Mc/s. band is included, although it has not yet been possible to conduct tests on these frequencies.

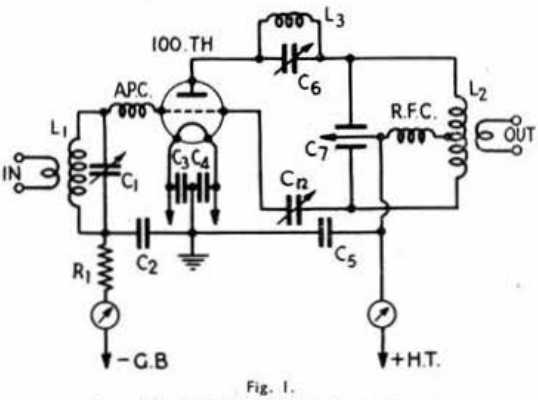


Fig. 1.

Power Amplifier with 42 Mc/s. harmonic trap.

L1	Normal grid coil.
L2	Normal anode coil.
L3	12 turns 18 S.W.G. bare copper wire ½ in. I.D. Spacing $\frac{1}{16}$ in.
C1	100 pF variable.
C2	·002 μF mica.
C3, 4	·01 μF tubular paper.
C5	·002 μF 2,000 v. working mica.
C6	3 to 20 pF midget air spaced variable.
C7	50—50 pF variable.
CN	Neutralising condenser.
R1	3,000 ohms 10 watts.
APC	Anti-parasitic grid choke, 10 turns, 18 S.W.G., ½ in. diameter
RFC	2·5 mH.

TABLE I.

Band. Mc/s.	Harmonic.	Range. Mc/s.	Chance of Interference.
1·715–2·0	21st, 22nd, 23rd, 24th	36–48	Negligible
3·5– 3·8	12th, 13th	42–49·4	Slight
7·0– 7·3	6th	42–43·8	Moderate
14·0–14·4	3rd	42–43·2	Serious
21·0–21·4	2nd	42–42·8	Serious
28·0–30·0	2nd	56–60	Serious†
58·5–60·0	—	Funda-mental	Serious†

† Serious on account of "break-through."

From the above Table, it will be observed that the 14 Mc/s. and 21 Mc/s. bands are the most likely to produce interference due to harmonic radiation. No evidence of interference due to a 1·7 Mc/s. transmitter has been encountered. Transmitters operating on 3·5 Mc/s. and 7 Mc/s. within 100 yards of a television receiver produced some interference which was thought to be due to "shock-excitation" rather than harmonic radiation, and this was cured by inserting a high-pass filter in the television receiver aerial feeder. However, subsequent measurements on a typical 75 watt 3·5 Mc/s. transmitter disclosed a rather alarming amplitude of the 12th and 13th harmonics, indicating that action at the transmitter was necessary. In the case of interference from 28 and 58·5 Mc/s. transmitters, a filter in the receiver aerial appears to be essential.

Equipment at G5RV

The equipment used in the tests described comprised :—

(1) A 1·7 Mc/s. 10 watt telegraphy and telephony transmitter.

(2) A 3·5 and 7 Mc/s. transmitter employing an 813 final amplifier with 75 watts input on C.W. and 40 watts on grid-modulated telephony. The P.A. was partially screened and link coupled to an aerial tuning unit.

(3) A 14 and 28 Mc/s. transmitter employing an *Eimac* 100 TH with 150 watts input on C.W. and class B modulated telephony, fully screened.

* 184, Galleywood Road, Chelmsford, Essex.

The aerial systems consisted of two folded dipoles with 300 ohm feeders—one for 14 Mc/s. and one for 28 Mc/s.—and a multi-band 102 foot flat top centre-fed aerial with 500 ohm resonant feeder line, which was used on both 14 and 28 Mc/s. This latter was used as a dipole on 3·5 Mc/s. and as a capacity top loaded Marconi aerial (with feeders connected together at transmitter end) on 1·7 Mc/s.

All three aerials were coupled to the third transmitter by a three-turn coil.

In the case dealt with below, the television receiver was located four houses away from G5RV on the same side of the road. The transmitting aerial was on the Alexandra Palace side of the television receiving aerial and the receiver was a pre-war *Pye* model in the low-price range. It was felt, therefore, that this was a good test of the measures taken to cure the interference.

Types of Interference Analysed

A careful observation was first made to establish the type and severity of the interference. On 3·5 Mc/s., some trouble was experienced from "key-thump" on the sound channel, but no interference was noticed on vision. On 14 Mc/s., both C.W. and telephony produced serious interference to sound and vision; in addition to the usual interference patterns, the receiver synchronising was frequently upset and the picture lost. No tests were carried out

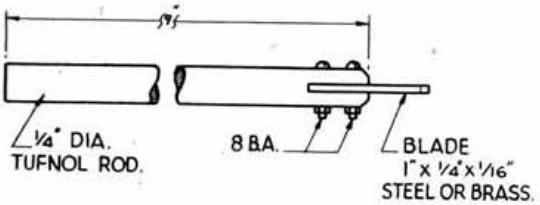


Fig. 2.
Trimming tool for harmonic trap.

on 28 Mc/s. until after the interference had been cleared on the other bands, and it was then found that no 28 Mc/s. interference was being caused. Tests have not yet been carried out on 58·5 Mc/s. When interference was in evidence, reduction of transmitter power had little effect: 25 watts produced interference as serious as that produced by 150 watts irrespective of the band in use.

Affecting a Cure

It was decided to fit a third harmonic trap for the 14 Mc/s. P.A. as shown in Fig. 1. An S27 receiver, whose "S" meter readings at 42 Mc/s. had previously been calibrated in decibels with the aid of a high grade signal generator, was used to determine the relative amplitude of the 14 Mc/s. third harmonic, before and after the filter was fitted and adjusted. The 14 Mc/s. interference on telephony was completely cured by this simple trap circuit. Some key thump, however, persisted on the sound channel in the television receiver despite the fact that no clicks were audible in the S27 receiver when tuned to receive the A.P. sound programme on 41·5 Mc/s., although this receiver was located in the room immediately beneath the transmitter. A 6 foot vertical wire was used on the S27 for this test.

The method of installing the trap was as follows:—First, a special insulated trimming tool was constructed, using a 9 in. length of Tufnol rod of ¼ in. diameter. This was *most important* both to reduce the hand-capacity effects and as a safety precaution, as the trimming had to be undertaken with H.T. on the transmitter. The metal blade of the trimmer tool engaged in the slot (cut with a hacksaw) in the shaft of the trap circuit tuning condenser. Details of the construction are shown in Fig. 2. The trap condenser was then mounted on a piece of Dystrene sheet, 2½ in. × 1½ in. × ⅛ in., which was supported on the tank condenser to allow very short connecting leads.

The coil was soldered directly on the trap condenser, with its axis at right angles to that of the tank coil. The condenser was a midget double-spaced air trimmer, of capacity 3 to 20 pF. When calculating the size of the trap coil, allowance was made for the anode-to-filament capacity of the P.A. valve, and for stray circuit capacities which were effectively in parallel with the trap tuning capacity. The values shown in Fig. 1 are suitable for use with an *Eimac* 100TH, which has an anode-to-filament capacity of 0·4 pF.

The trap assembly was inserted in position—but not connected in circuit—and the transmitter tuned-up on 14·2 Mc/s. The S27 receiver (located in a room below) was fitted with a short vertical aerial and tuned to 42·6 Mc/s. The length of the aerial was adjusted until the "S" meter read S9. The transmitter was then switched off, and the trap connected in circuit. With the transmitter on, the trap condenser was carefully rotated, using the insulated trimmer tool, until a minimum reading was observed (by an assistant) on the "S" meter of the receiver. This minimum was S2, or 45 db. below the former reading. The vertical aerial was then lengthened, and attempts made to reduce further the 42 Mc/s. radiation by using a similar trap in the previous doubler stage, but negligible reduction was achieved.

At this stage, an interesting piece of information came to light. An HRO receiver, tuned to 14·3–14·4 Mc/s., which had been switched on for monitoring purposes, was found to radiate a third harmonic (42 Mc/s.) signal which was sufficiently strong to produce a faint cross-hatch pattern on the screen of the television receiver. Disconnecting the aerial from the HRO did not reduce the strength of the interfering radiation. It was this radiation, and not that due to the negligible amount contributed by the sixth harmonic of the 14 Mc/s. doubler, that prevented further effective reduction of the 42 Mc/s. radiation. However, as the interference caused was not considered serious in this instance, and only occurred when the HRO was tuned to frequencies between 14·3 and 14·4 Mc/s., this problem was left for the time being. In cases where severe interference from this cause is experienced, an attempt should be made to reduce the receiver third harmonic radiation to a negligible amount by screening and filtering the supply leads to the heterodyne oscillator.

With the installation of the filter, the television picture was unaffected by either C.W. or telephony on 14 Mc/s. However, on the sound channel, key

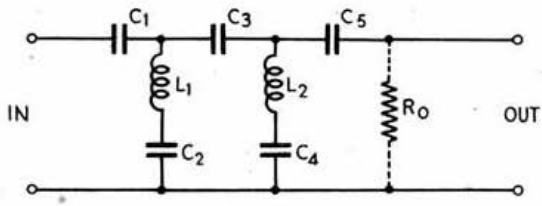


Fig. 3.

Two section M-derived high-pass filter, with a cut-off frequency of 30 Mc/s. and a maximum attenuation at 14·3 Mc/s.

L1, 2	0·241 μH, 7 turns, 16 S.W.G. tinned copper wire ¼ in. O.D. (wound on ⅜ in. dia. former then removed). Winding spaced to occupy a length of ⅜ in. Length of coil leads (each end) ⅜ in.
C1, 5	71 pF T.C.C., type CM23N, ± 2 per cent. silver mica.
C3	35 pF T.C.C., type CM23N, ± 2 per cent. silver mica.
C2, 4	520 pF T.C.C. (470 and 47 pF T.C.C., type CM24N and CM23N in parallel) ± 2 per cent.
RO	80 ohms ¼ watt if required—normally not required if input impedance of T.V. receiver is approximately 80 ohms.

thumps were heard, but no telephony interference was observed. The 3·5 Mc/s. transmitter produced slight interference on sound only, and this was thought to be " break-through " of the 3·5 Mc/s. fundamental.

Harmonic Radiation from 3.5 Mc/s

At the time of these tests, as mentioned previously, 12th and 13th harmonic radiation from the 3·5 Mc/s. P.A. stage was thought to be negligible, and no trap was used. Subsequent tests, however, showed that a transmitter employing an 813 final amplifier at 150 watts input on 3·5 Mc/s. produced a 13th harmonic only 20 db. lower than the third harmonic when the same valve was used on 14 Mc/s. It would appear, therefore, that a 42 Mc/s. trap should be fitted to all output stages, except those on 1·7 Mc/s.

Filter at Television Receiver Aerial

In order to overcome the last traces of interference, a simple two-section M-derived high-pass filter was designed for inclusion in the 80 ohm television aerial feeder, details of which are given in Fig. 3. With the filter in circuit, no interference was detectable, either on sound or vision, from any of the transmitters.

The receiver filter was constructed in a small screened box, with the two sections separated by a screening partition, and terminated with a co-axial plug and socket, so that the effectiveness of the device could be demonstrated by inserting it in the feeder while transmissions from the amateur station were in progress.

General Observations

The following points should be noted, as they bear on the conditions under which the experiments were carried out :—

(1) Initial tests indicated that all the interference was being introduced *via* the television aerial. As a precaution, a mains R.F. filter is used at G5RV.

(2) Working any of the transmitters into an artificial aerial without an harmonic trap, produced no interference.

(3) Additional harmonic suppression, amounting to a further 45 db., was achieved by inserting into the transmitting aerial feeder one of the harmonic filters described in the *Amateur Radio Handbook*.

The use of harmonic filters in the feeders is inclined to be cumbersome if various aerials and different types of feeder are used, since the filter must be designed for a particular feeder impedance. Feeder impedance at the transmitter end of the line will vary from one band to another, unless separate aerials can be used for each band having correctly terminated lines of some suitable common value. In the latter case a suitable harmonic filter could be inserted permanently in the output line from the transmitter, or transmitters, and, if used in conjunction with the harmonic trap circuit as described above, would give an adequate measure of harmonic suppression even for very severe cases of interference.

An excellent article on the subject of Television Interference, by Mack Seybold, W2RYI, appeared in *QST* for August, 1947. This article, which dealt with an 813 P.A. stage, was on similar lines to the present article. However, the television channels used in the United States are different from those employed by the B.B.C., and are, therefore, in a different harmonic relation to the amateur bands. Furthermore, the receiver filter used by W2RYI would not be suitable for use with an 80 ohm co-axial feeder, which is standard for television installations in the United Kingdom.

European Band Planning

The following Band Plan drawn up by the Codes of Practice Committee of the Radio Society of Great Britain, and approved by the Council of that body, has been submitted for consideration to all I.A.R.U. Societies in Europe. Copies of the plan have been forwarded to I.A.R.U. Headquarters and to the W.I.A. (Australia), N.Z.A.R.T. (New Zealand) and S.A.R.L. (South Africa) for information.

The Council of the Society recognises that any form of Band Planning will fail unless it is introduced into the licence and enforced by the respective licencing authorities. For this reason the European Societies have been asked, when commenting on the plan, to indicate whether they consider that their licencing authority will agree to make the plan mandatory if it is finally adopted.

Details of the Plan are set out below :—

Band	*Frequencies*	*Proposed Occupancy*
1·7 Mc/s. ..	—	Telephony and C.W. (no sub-division considered necessary).
3·5 Mc/s. ..	3500– 3550	C.W. only.
	3550– 3750	Telephony and C.W.
	3750– 3800	Telephony only.
7 Mc/s. ..	7000– 7050	C.W. only.
	7050– 7100	C.W. and Telephony.
	7100– 7150	Telephony only.
14 Mc/s. ..	14000–14050	C.W. only.
	14050–14200	C.W. and Telephony.
	14200–14250	Telephony only.
	14250–14350	C.W. and Telephony.
21 Mc/s. ..	21000–21100	C.W. only.
	21100–21150	C.W. and Telephony.
	21150–21250	Telephony only.
	21250–21450	C.W. and Telephony.
28 Mc/s. ..	28000–28100	C.W. only.
	28100–28400	C.W. and Telephony.
	28400–28500	Telephony only.
	28500–29700	C.W. and Telephony.
Above 28 Mc/s.	No sub-division between Telephony and C.W.	

C.C.I.R. Stockholm

In preparation for the International Radio Consultative Conference (C.C.I.R.), to be held in Stockholm during July next, a General Purposes Committee has set-up six Groups to study technical questions referred to the C.C.I.R. from the Atlantic City Conference. The R.S.G.B. is represented on three of the Groups by Messrs. F. Charman, B.E.M., G6CJ (Band Widths—Technical Performance of Transmitters), D. W. Heightman, G6DH (Radio Propagation), and S. K. Lewer, B.Sc., G6LJ (International Monitoring).

The Society is represented on the General Purposes Committee by Messrs. A. E. Watts, W. A. Scarr and John Clarricoats—three members of the G.P.O. Liaison Committee.

Sun Spot Activity

The Department of Scientific and Industrial Research reports an unexpectedly large drop of over 40 per cent. in the sunspot numbers during the present quarter. Maximum usuable frequencies are liable to be 10 per cent. below predicted values. It appears that the high level of sunspot activity during 1947—the highest recorded in any year since 1778—will not be maintained in the current year. Have the 50 Mc/s. DX contacts already passed into history ?

A 35 Mc/s. HIGH-PASS FILTER

By P. F. CUNDY, A.M.I.E.E. (G2MQ)*

Introduction

THIS article gives details of a 35 Mc/s. high-pass filter designed to eliminate second channel interference with television reception from transmissions made in the 28 Mc/s. amateur band.

Certain television models marketed by a well-known manufacturer have a vision intermediate frequency of 8 Mc/s., the local oscillator is therefore on 37 Mc/s. As the radio frequency selectivity is not very high they are clearly prone to second channel trouble.

A filter of the type described will successfully prevent 28 Mc/s. signals reaching the receiver through the aerial lead, but it will not be effective against mains-borne signals or those picked up by the internal wiring of the receiver. Neither will it help if spurious harmonics at or near television frequencies are being radiated.

List of Symbols

The following symbols are used in the text.

fc	=	Cut-off frequency.
fr	=	Frequency of very high attenuation.
Wc	=	$2\pi fc$.
Wr	=	$2\pi fr$.
K, m	=	Filter design constants.
L, C, L_1, C_1, L_2, C_2	=	Values of filter elements.
R	=	Filter terminating resistance.

Design Considerations

(*a*) Cut-off frequency.

This was chosen as the geometrical mean of the desired 41·5 Mc/s. sound frequency and the highest probable frequency of the interfering signal, namely, 30 Mc/s.

fc approximately equals $\sqrt{41{\cdot}5 \times 30} = 35$ Mc/s.

(*b*) Termination impedance.

This was determined by the input impedance of the receiver and the characteristic impedance of the feeder, and was judged to be about 80 ohms.

(*c*) Filter configuration.

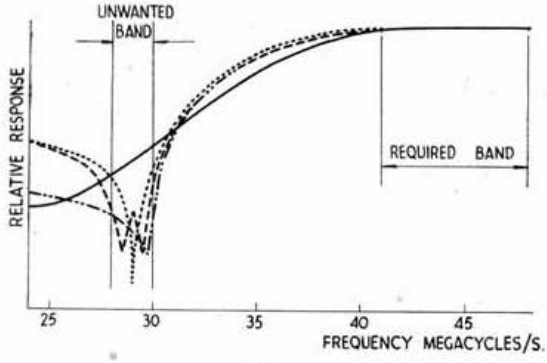


Fig. 1.
Relative response curves of two section filters of various types.
i ——— Two constant-K sections.
ii ..... Two *m*-derived sections of identical *fr*.
iii — — — Two *m*-derived sections of staggered *fr*.
iv —·— One constant-K section and one *m*-derived section.

*52 Highfields Close, Amersham, Bucks.

As it was considered unlikely that a single section filter would give sufficient attenuation a two section arrangement was chosen. Four possible alternatives were considered: (i) A two section constant-K filter, (ii) a two section *m*-derived filter, the *fr* being the same for both sections, (iii) a two section *m*-derived filter, with a different *fr* for each section, and (iv) one constant-K and one *m*-derived section. The predicted characteristics are shown qualitatively in Fig. 1.

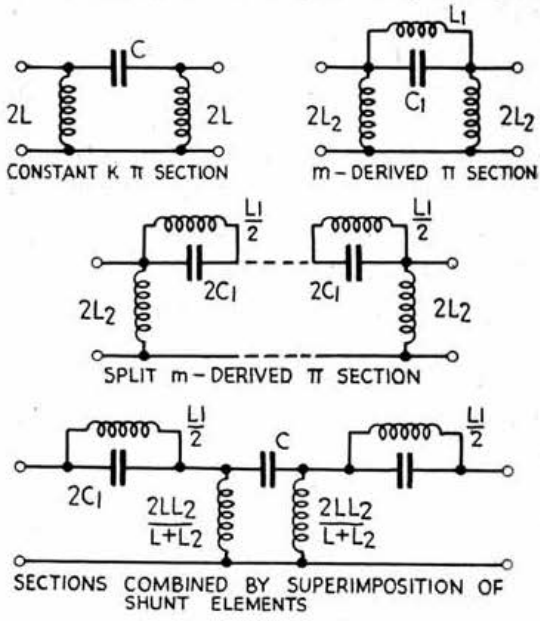


Fig. 2.
Development of filter configuration.

Design (i) gives relatively poor attenuation at the desired frequency and has poor impedance matching. Design (ii) is satisfactory providing the interfering signal falls within the relatively narrow rejection band. Design (iii) is satisfactory but leads to critical component values of awkward sizes. Design (iv) gives a satisfactory performance, yields simple component values and affords reasonable impedance matching if the *m*-derived section is split and used as two terminating half sections. The latter, in the π or mid-series form, was adopted.

(*d*) Selection of value for *m*.

Best impedance matching is secured at about $m = 0{\cdot}6$. The relationship between fc and fr is also determined by m as shown in the following equation (for high pass filters only).

$$fr = fc\sqrt{1 - m^2}$$

The smaller m is made the closer fr approaches fc and the sharper the cut-off, but the attenuation at frequencies below fr becomes reduced and values of m below about 0·45 are to be avoided if possible. It was found that $m = 0{\cdot}5$ lead to particularly simple component values and was adopted, but since it was desirable to make fr just below the maximum probable frequency of the interference (say 29·7 Mc/s.) the adoption of this value for m necessitated slight readjustment of fc to 34·3 Mc/s.

Determination of Component Values

The development of the filter from its constant-K and m-derived elements is shown in Fig. 2 in which

$$C = \frac{1}{2RWc} \quad . \quad L = \frac{R}{2Wc} \quad . \quad L_1 = \frac{4Lm}{1-m^2}$$

$$L_2 = \frac{L}{m} \quad \text{and} \quad C_1 = \frac{C}{m}$$

if fc is in megacycles/s, Wc in megaradians/s, and R in ohms, then L is in microhenrys and C is in microfarads. It was necessary to evaluate the following component values :—

$$C, \quad 2C_1 = \frac{2C}{m}, \quad \frac{L_1}{2} = \frac{2Lm}{1-m^2}, \quad \frac{2LL_2}{L+L_2} = \frac{2L}{m+1}$$

noting that with $m = 0{\cdot}5$, $\frac{L_1}{2}$ and $\frac{2LL_2}{L+L_2}$ are the same and that $2C_1 = 4C$. The first determination of C followed as under :—

$$C = \frac{1}{2RWc} = \frac{1}{2 \times 80 \times 2\pi \times 34{\cdot}3} = 29pf$$

$2C_1$ is therefore $116pF$.

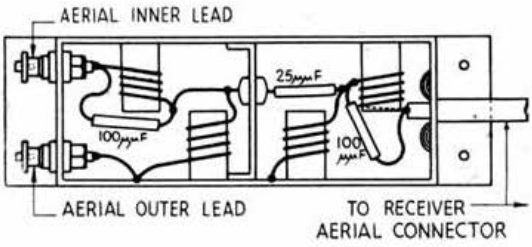


Fig. 3.
Layout of components with screening box. The braiding of the co-axial cable is unravelled and soldered to the inside of the box. Both terminals are mounted on insulated bushes. Coils are 4½ turns of 18 S.W.G. tinned copper wound 16 t.p.i. on ½ in. diameter formers.

As neither of these are standard values the impedance was changed to 92·5 ohms when $C = 25pf$ and $2C_1 = 100pf$.

This figure was considered close enough to the estimated 80 ohms to be acceptable in view of the simple component values.

The inductances were then calculated from the above data :—

$$L = \frac{R}{2Wc} = \frac{92{\cdot}5}{2 \times 2\pi \times 34{\cdot}3} = 0{\cdot}215\mu h$$

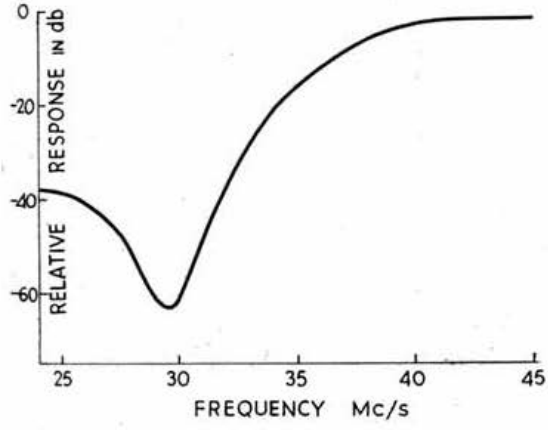


Fig. 4.
Final response curve.

so that :—

$$\frac{L_1}{2} = \frac{2Lm}{1-m^2} = \frac{2LL_2}{L+L_2} = \frac{2L}{m+1} = 0{\cdot}285\mu h$$

Construction

The filter was built into a box made of 18 S.W.G. tinned iron, the approximate dimensions being 1½ in. deep 2½ in. wide and 5 in. long. An internal screen was provided to prevent undesirable coupling between sections and a close fitting "push-on" lid was also made. The base of the box was extended and drilled to provide mounting brackets.

The layout of the components within the box is shown in Fig. 3, which also gives the coil details. The condensers were ordinary silvered-mica components of ± 10 per cent. tolerance and were taken from stock without special selection.

The measured performance of the finished filter is given in Fig. 4.

EDITORIAL (*Continued from page* 169)

problem of 14 Mc/s. operation and we have nothing to offer but the continued perseverance with harmonic rejectors of all types. It must be emphasised, however, that it is useless to insert a harmonic filter and to leave the slightest gap in the screening behind that point.

One unfortunate feature of this side of the problem has been raised. Suppose that interference has been successfully reduced in a given town by diligent work and maybe a considerable expenditure on the part of all the amateur transmitters living there. Then the residents of other towns still further away will be encouraged by the results obtained in the first-mentioned town, and the amateurs there will be faced with a problem of even greater magnitude. Where will it all end ? In a town which we have in mind, which happens to contain a high proportion of amateurs and television viewers alike, we have had complaints that the radiation from the local oscillator of a short wave broadcast receiver is sufficient to spoil reception !

Are we justified in expecting continued interference-free reception in such situations, and if not, how can we differentiate between situations where reception can be guaranteed by the enforced reduction of sources of interference, and areas where reception may be possible due to a fortuitously low interference level which cannot be guaranteed ?

We believe that some legislation which may envisage such circumstances may be in course of consideration but we frankly cannot, at this stage, make many useful suggestions as to how it could be enforced. H.A.M.C.

LOW POWER N.F.D. 1948

At the request of the Contests Committee the Council has amended Rule 7 to read :—

"The total D.C. power input to the anode circuit of the valve or valves energising the aerial or any preceding stage of the transmitter shall not exceed 5 watts. Power shall not be derived from supply mains."

The original rule required all transmitters and receivers to be operated from a dry battery source of supply, and limited the total heater or filament consumption of the transmitter or receivers in use to a maximum of 6 watts.

CONVERTING THE T1333 INTO A FREQUENCY STANDARD

By R. T. L. ALLEN, M.A. (BRS 9849)

THE R.A.F. type T1333 transmitter can easily be converted into a crystal-controlled frequency standard giving modulated or unmodulated signals at intervals of 500 or 2,000 kc/s. This article describes how it may be done with a minimum of alteration.

Modifications

"As issued," the T1333 is a 500 kc/s. emergency transmitter for CW or MCW (see Fig. 1). The heaters are not shown; in fact, one side is earthed (blue wiring) and the other side is connected, by grey wiring, to the power socket. The component numbers in this figure are those actually marked on the transmitter; the terminal markings on the AF transformer T1 evidently should not be taken at their face value. A hand-driven generator is incorporated, with optional automatic keying. Fig. 3 shows the set converted into a frequency standard. The component numbers in this figure are not necessarily the same as those actually marked on the transmitter.

The first alteration is in the anode circuit of the crystal oscillator (6V6G). The "CW-MCW-Hand-Auto" switch is made to serve as a selector for 500 kc/s. or 2,000 kc/s. intervals. The existing anode tuning condenser may be retained, with the knob removed, or it may be replaced by a trimmer of about 150 $\mu\mu$F maximum capacity, which is more compact. Any 2 Mc/s. IF transformer will serve as T2. The one actually used was home-made, with a primary winding consisting of 19 turns of 24SWG DCC wire wound in three layers on a 1in. diameter former, and a secondary winding consisting of 27 turns of 26SWG DCC wire wound in three layers on the same former. Each winding is about 5/16 in. wide, and the distance between centres is 15/16 in. The transformer is unscreened. These coils were wound on in layers with no attempt at honeycomb winding, as the Q does not need to be particularly high.

For intervals of 1,500 kc/s. between harmonics—instead of 2,000 kc/s.—the primary and secondary windings of the coupling transformer should have about 25 and 40 turns respectively with the same trimmer values as for 2,000 kc/s. R6 serves the dual purpose of decoupling and reducing the power input to V1.

The circuit of V2 is more thoroughly rearranged. The control grid and screen grid of V2 form a triode AF oscillator, the original anode winding of T1 being wired in the screen grid lead; the original output winding of T1 is disconnected. The key is arranged to short-circuit a series resistor in the control grid circuit which normally prevents oscillation.

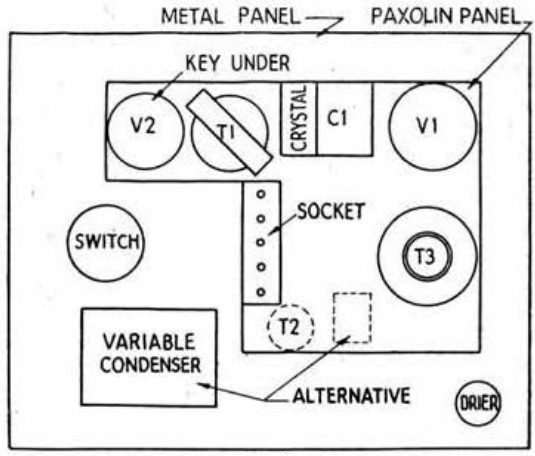


Fig. 2.
Lay-out showing additions.

The suppressor grid and anode of V2 form a distorting amplifier which is fed with signals at either 500 or 2,000 kc/s. from V1 and modulated at audio frequency when the key is pressed. R9 and R10 provide about 17 volts bias on the suppressor grid. The

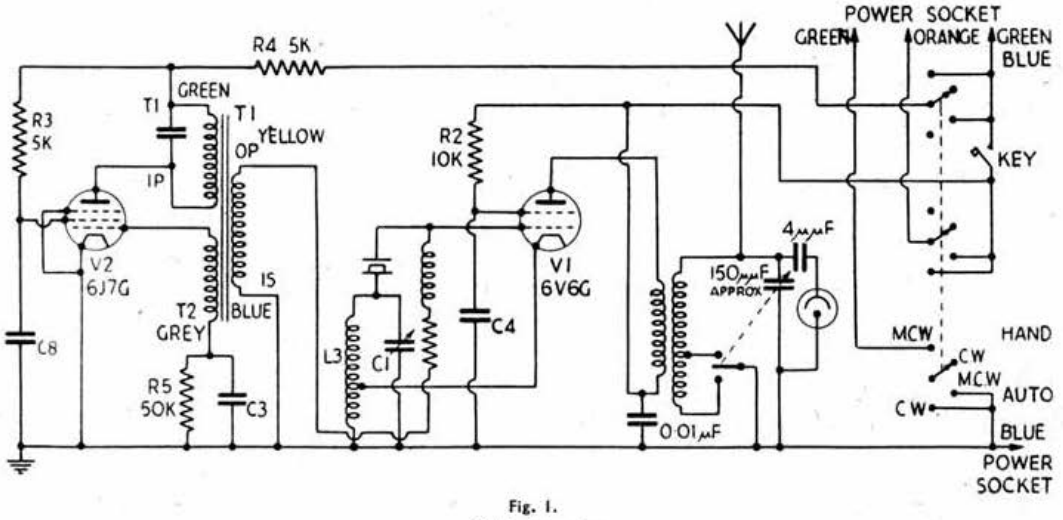


Fig. 1.
Original circuit.

anode resistor R7 is kept low in order to maintain the output at a reasonably constant figure over as wide a frequency band as possible.

A power supply giving about 20mA at 200 volts, and 6.3 volts 0.75 amp for the heaters, is required.

Construction

Most of the components are mounted on a paxolin sub-panel standing on pillars about 1 in. high on the main steel panel, which measures 10½ in. × 8½ in. The lay-out is given in Fig. 2, the extra components being shown dotted. The coupling transformer T2 is mounted with its axis vertical, and a double trimmer is mounted on top. A trimmer to replace the original anode tuning condenser for V1 may be mounted alongside T3.

Performance

The accuracy of the crystal is stated to be ± 0.025 per cent. The frequency of a crystal may be adjusted slightly by means of a condenser in series, to raise frequency, or in parallel, to reduce frequency, or by a circuit such as that described by E. W. Nield in the September 1946 issue of the BULLETIN, but this can only be done at the expense of stability. A better procedure, if greater accuracy is required, would be to measure the frequency of the crystal accurately by means of an interpolation oscillator, and then make an appropriate correction whenever it is used.

Ample output is available up to about 23 Mc/s. No measurements have been made at higher frequencies, but there can be little doubt that results would be satisfactory in the 28 Mc/s. band. For operation at higher frequencies a RF choke in series with R7 might be helpful. With the switch in the 2,000 kc/s. position signals can still be heard at 500 kc/s. intervals, but there should be no difficulty in distinguishing the 2,000 kc/s. harmonics.

Although modulation is not usually provided in frequency standards it may be useful. If there is any doubt whether a signal in the receiver is a carrier from a transmitter or a signal from the standard, a touch on the key will settle the question immediately.

There is no doubt that the circuit described could be improved upon quite considerably. A less powerful valve than a 6V6 might be used as crystal oscillator, and a triode-hexode would make a better modulator and harmonic generator, but the object of this article is to show how a useful instrument may be made with as little modification as possible.

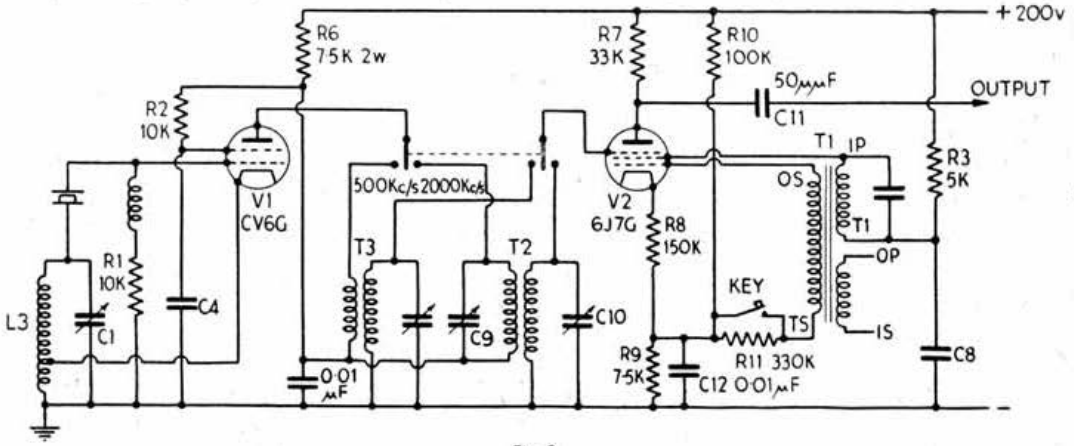


Fig. 3.

Circuit as modified.

Components added:—

R6	7,500 ohms 2 watts	R9	7,500 ohms ½ watt	C10	200 μμF trimmer
R7	33,000 ohms ½ watt	R10	100,000 ohms ½ watt	C11	50 μμF
R8	150 ohms ½ watt	R11	330,000 ohms ½ watt	C12	0.01 μF
		C9	400 μμF trimmer	T2	See text.

V1 is a 6V6G not CV6G as shown in Diagram.

More Enterprise

A sample of the interesting QSL card produced by the Wolverhampton Borough Council and presented to local amateurs.

OUR FRONT COVER

THE unit illustrated is the band-switched exciter in use at G2ANR (B. W. Montague).

It comprises three QVO4-7's, as crystal oscillator, 14 Mc/s. doubler and 28 Mc/s. doubler respectively, followed by a QVO5-25 output stage. Provision is made for operation from a separate V.F.O.

The unit may be used either to drive a final amplifier, or as a complete transmitter in itself, in which case it will handle 40 watts input to the QVO5-25 on either C.W., or anode and screen modulated telephony.

THE RADIO AMATEURS' EXAMINATION

HINTS FOR CANDIDATES

By J. P. HAWKER (G3VA).*

DURING May, at centres all over the British Isles, several hundreds of members will sit for the Radio Amateurs' Examination. Success will bring a transmitting licence within easy grasp ; failure will mean a setback of at least twelve months. Last year the percentage of failures reached alarmingly high proportions, due largely—it would appear—to lack of adequate preparation in examination technique. Candidates who have been long absent from the examination room often find it extremely difficult to put their knowledge on paper in such a way as to obtain high marks ; and it is hoped that this article will provide a few practical hints—particularly for those members who are unable to attend local classes or to spare the time for correspondence courses.

The Examination Paper

In the space of three hours, candidates are expected to answer eight questions. There are no optional or alternative questions, but usually several are of "special value" carrying 15 or 20 marks apiece. Obviously, particular attention should always be given to these high-value problems, but an attempt should be made to answer *every* question since even an odd mark or two may make all the difference between a failure and a pass.

Although the complete syllabus for the examination sometimes appears alarming, it is possible—where necessary—to compress the amount of preparatory work a little by "intelligent anticipation" of likely questions. This is not just a matter of hopefully guessing at what the test paper will contain. But when the aims and purposes of the examination are considered, it soon becomes clear as to what type of question is almost certain to occur in some form or other and to carry high marks. As one of the main objects of holding the examination is to ensure that amateur operators will not cause interruption to other communication services, it follows that emphasis will always be placed on questions of frequency measurement and stability, causes of broadcast and television interference (especially harmonic radiation), the suppression of key-clicks and parasitic oscillation, overmodulation and correct neutralisation.

Unfortunately for the beginner, these problems—being peculiar to transmitting—are likely to be the very ones of which he will have had little practical experience. In fact a variation on the old difficulty of "the hen and the egg" has turned up again—how is the candidate to gain knowledge of problems not encountered until after the examination has been passed ! Every opportunity should be taken to discuss these matters with experienced operators as well as giving careful attention to the relevant passages in *The Amateur Radio Handbook*.

Answering the Questions

At the actual examination, the first step is to read right through the paper. Your immediate reaction is almost certain to be one of pessimism. Examiners have a curious facility for making even a simple problem appear complicated ! Then, after having skimmed through the paper, start again—only this time read it more carefully. You will find that a few of the words and phrases will begin to "make sense," and there will be at least one question about which you will feel confident of your ability to answer. There is no need to plough through the test paper in the order set providing that you clearly number your answers. So gain confidence by answering first the ones that come easiest to you. The only danger to avoid in this system, is not to let your enthusiasm for any particular question allow you to forget that your time is limited.

Having selected a question and made sure that you really understand what is required, note down upon a piece of rough paper a short list of the chief points that come to mind—a word or two representing a paragraph. Marshal these facts into order and only then begin your real answer.

Style

Examiners are only human ; illegible writing will not assist them to assess your efforts, and knowledge not disclosed in your answers is worthless. Instructions regarding the heading of your paper should be strictly carried out. Careful phrasing in an impersonal style will pay a high dividend of marks. Avoid dogmatism and always set out the advantages and disadvantages of any system clearly and without prejudice. You may dislike variable frequency control intensely, but it is no answer to a question on self-excited oscillators to say that you always intend to use crystal control !

Wherever possible illustrate your answers by means of technical diagrams, but remember that if asked for a "block schematic diagram" you will not gain extra marks—but merely waste a lot of valuable time—by giving a full theoretical circuit. When a question is finished, read carefully through what you have just written with an eye to the rules of grammar and spelling. It is easy to make elementary mistakes when in a hurry. Diagrams should also be scrutinised—a bad impression is given when a condenser is overlooked and the high voltage left shorted !

No Radiese

Finally do not use slang or the "radiese" that is so often employed by amateurs in correspondence. After the last examination comment was made on the use of "abbreviated and corrupt English" and, at the same time, attention was drawn to the flippant nature of some of the answers. It was suggested that many candidates treated the examination as a not very serious matter.

So above all, approach the examination in a balanced frame of mind. Remember that it *is* an examination and cannot be treated just as a joke, but on the other hand, do not let yourself be too overawed by the occasion. You are not expected to be a mathematical genius or to write literary masterpieces. The authorities are only anxious to make certain that you know sufficient about transmitting and radio communication to ensure that you can make proper use of the facilities they will grant.

*Assistant to the General Secretary.

Side Slip

In Fig. 1 of the article entitled "Probe Valve-Voltmeter and D.C. Volt-Ammeter," by A. G. L. Foster, G3API, published in our last issue, the H.T. feed is shown as 200 volts, 6mA, instead of 200 volts, 60 mA.

THE MONTH ON THE AIR

By A. O. MILNE (G2MI)*

Rescue

A FINE piece of work done by three Northern Ireland amateurs has come to our notice for not only was it a case where an intelligent disregard of normal regulations was essential, but it also shows that amateurs still retain that resource which served the country so well during the war.

Whilst working on 7 Mc/s. recently GI3BUP picked up an SOS from a crashed Danish aircraft in Greenland, call-sign OXALT. He and GI3CLS thereupon got busy, passed the information to OX3BG in Greenland who contacted the authorities concerned. Whilst they handled the traffic and kept in touch with the plane, GI6TK contacted the R.A.F. in Belfast and gave them the essential information as it came through, for retransmission to the Danish authorities in Copenhagen. The contact was maintained from 11 p.m. until 4 a.m. the next day and the survivors of the accident were ultimately rescued.

An interesting point was that the operator of the aircraft had tried to gain attention on his recognised distress frequencies without result and then decided to try an amateur band as a last resource.

This sets us wondering. Would it be a good thing for all aircraft and lifeboats to carry a crystal for operation in one of the amateur bands? We all know that there is always someone listening and conditions may easily be repeated whereby this might be the only way of gaining attention in cases of distress.

Whilst it would be almost impossible for the official stations to cover every eventuality, there would almost certainly be some amateurs within signalling distance however bad conditions might be. Congratulations to the Irish boys on their very fine job of work.

Philippine Islands

Apropos recent notes about the position in KA we have the following information from A.R.R.L. "According to the Under-Secretary of the Department of Commerce in the Philippines, the present Government there, for security reasons, does not allow the Philippine amateurs to work foreign amateurs except Americans." The Philippine amateurs are still hoping that the present regime will see eye-to-eye with them and lift the DX ban for the sake of amateur progress in the islands.

We think the Philippine authorities would do this quickly if only they realised how bad has been the impression given to amateurs throughout the world. The A.R.R.L. assures us that this is not part of a diabolical plot to keep W's at the top of the DXCC listings!

Notes and News

G3ASM has worked SKZA, the Swedish ship S.S. *Agnete Christensen*, 3,500 tons on 7 Mc/s. and has had a QSL. He says PA1XU is the commercial frequency control station at Haarlem. Operator PA1RCD. G8OJ has worked VK7YL at 1032 G.M.T. on 7011. Yes, the operator is a YL.

It is a waste of time calling VP5AS. He has a rhombic on the States and does not appear to be interested in contacts elsewhere. G5CR has worked SMA on 3498. He answered G5CR'S CQ and promises to QSL QTH Stockholm Meteo. Stockholm 40, Sweden. VQ4HGB, the original AC3SS, is now active and says ET3AD is an American at a mission near Gimby, 300 miles from Addis Ababa. He has no other means of communication except runner. VP4TT *via* G5UX says ten listener reports a day are too many. In future no QSL's will be sent except for actual QSO's. VU2CD would like to contact someone in Cheltenham on 14 Mc/s.

VU DX
Front row, left to right, VU2AJ, 2BT, 2BV. Standing VU2BD, 2BZ.

*29 Kechill Gardens, Hayes, Bromley, Kent.

SV1RX appeals to all amateurs not to send QSL's direct to Greek stations. All QSL's should come to the R.S.G.B. Bureau.

Cards are in from W2WMV/C9 in Mukden. G4KS is one of the lucky ones, incidentally he made the contact on 7 Mc/s. G3AQO condemns people who make lengthy tests of their transmitters with the aerial connected. An artificial aerial does reduce unnecessary radiation, chaps.

Several members have taken us to task over UA0KGA. No, it was not a misprint. US0KGA is the same outfit but in a different location. Our information is that when signing US0KGA the expedition is situated in Zone 23. Has anyone yet worked the Gatti-Hallicrafters Expedition in Tanganyika? Call-sign VQ4AHG.

G3ATL is now also licenced as ZL2AFP and is working portable-mobile on board a steamship—14 and 7 Mc/s. CW and 28 Mc/s. 'phone. QSL to D. I. Wiggans, "Dunster Lea" Rochdale, Lancs. BRS11494 commends 3·5 Mc/s. to the DX man and has also found a few "plums" on the other bands VE8MB on 14 VP2KS, St. Kitts, VP3LF and VK9NK all at the H.F. end of 14. ZD3B is also at this end of the band around 2100. VS7PS and VS7AC on 28 around 0900 are very good signals. ZP5AC has been heard several times on 14. He speaks English but does not QSL, at least he did not QSL G2MI!

New Prefixes for East Africa

I6ZJ informs us that new prefixes have been issued to civilian amateur stations in certain East African Territories.

These are as follows: Cyrenaica, MC1; Tripolitania, MT2; Eritrea, MI3; Italian Somaliland, MS4.

The MD calls remain for Services personnel. From March 1 all Services personnel in Japan will use the prefix HL.

QRP

Some excellent contacts are still being made on low power. GM3CXE has been working W's consistently with 10 watts on 7. G2BBP with 1·5 watts on this band also manages plenty of contacts in Europe. G3AHO with 5 watts on 3·5 says there are plenty of good QSO's available but things would be easier without some of the thoughtless 'phone QRM.

G3CSX has had several successful schedules with W2PZ who uses 3 watts on 3·5. He wonders whether CX5HA knows about that extra dot which turns his H into a 5!

Pitcairn Island

We understand from W1FH that VR6AA has almost completed the task of making out his cards and that they will all be sent together. Nelson Butler's successor has now arrived on the island and Nelson himself will probably leave for New Zealand shortly.

With regard to the shipment of oil, a snag has now arisen over the freightage. The shipping company originally stated that no charge would be made but now say this only held good for freight sent from England. As the oil was shipped from New Zealand, this concession does not apply. The writer has accordingly received a bill for £22 8s. 11d. freightage! The original charge for the oil was £23 16s. 6d. which was met from the first appeal and a number of over-subscriptions were returned to the donors. If there are some members who would like to take part in this gift and at the same time relieve G2MI of the bulk of this rather heavy charge, donations would be most welcomed. So far £2 2s. 6d. has been subscribed including 2s. 6d. from a German prisoner of war now working in this country, who being an ex-ham had saved the money from his pay, a rather fine gesture we think and one which proves that Amateur Radio knows no frontiers.

VK Contest

We have been informed by S/Ldr. G. Howard Williams G3BI, that VK2EO won the recent VK Contest with a score of 190,230 points, and that the U.K. winner was Mr. C. G. Allen, G8IG, with a score of 5,082. No confirmation of this information has yet reached us from W.I.A.

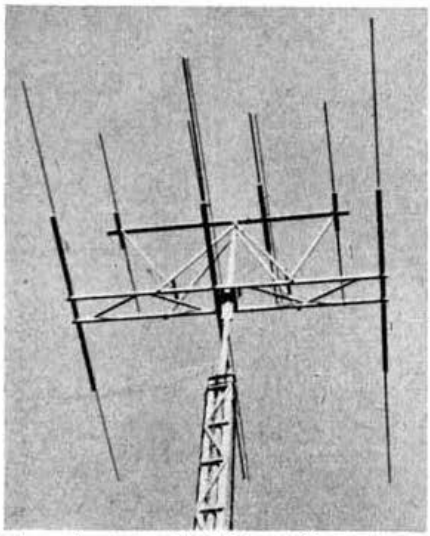
Public Schools' Expedition to Newfoundland

We learn from *CQ Local* (monthly publication of the South London R.S.G.B. Group) that the Public Schools Expedition station operated by G2BLA under the call G8XY/VO maintained regular schedule with the Admiralty, London, and that contacts were made with the following UK amateur stations:—G6ZO (7 Mc/s.), G5KJ and G4GI (14 Mc/s.). A G8 in Liverpool was also worked but difficulty was experienced in copying his call-sign.

Numerous QSO's were also effected with VO1, W1, 2, 3, VE1 and 3 stations. A B2 was used for amateur band contacts and a 40 watt transmitter for the Admiralty schedules. A full-wave aerial 273 ft. long, suspended at a height of 50 ft. over the water of a small lake, was used for 3·5 Mc/s. operation, on which band numerous contacts were made with "local" stations.

AROUND THE VHF's

By W. H. Allen, M.B.E., G2UJ.



The 4 element 5 metre and the 3 element 10 metre beam used at G6XM, Farnborough, Hants.

FROM all parts of the country comes increasing evidence of interest in V.H.F. operation, not only on 50 and 60 Mc/s., but also on those higher frequency bands which will become available to us when the Atlantic City allocations table comes into force. It is for this reason that we have decided to widen the scope of this feature to include topics of interest on *all bands* from 50 Mc/s. upwards, but to avoid the use of a somewhat ponderous title we shall refer to them all as the "V.H.F.'s" until someone produces a more appropriate and comprehensive description.

Five-Metre Hamfest.

The first event of this nature which we can recollect took place at the Falstaff Hotel, Fleet Street, London, on February 21st last. In spite of atrocious weather there was an attendance of 30 licensed amateurs, some accompanied by their ladies. A hearty vote of thanks was accorded to Phil Thorogood, G4KD, who was responsible for the arrangements, and the hope expressed that there would be more of these pleasant functions in the future. For the record, here is a list of calls of those present: G2AJ, KI, MR, NH, NM, UJ, YL, ZV, 3BTC, CWW, HT, 4KD, 5LQ, MA, MR, PY, RP, US, 6AQ, FO, JJ, KB, LX, NA, VX, 8IG, KZ, LY, PX, SM. We were sorry that 2KF, 2XC and 6DH were prevented by the weather from being present.

50 Mc/s.

No activity has been reported. G6DH found that the M.U.F. for the period seldom reached 40 Mc/s., although frequencies in the region of 46 Mc/s. were forecast, and concludes that the sunspot maximum has already passed. He has found that occasionally the M.U.F. reached 42 Mc/s. to the South East in the mornings, and thinks it possible that during March there may be a few openings for 50 Mc/s. in a Southerly direction. The drop in the M.U.F. as compared with January and February, 1947, is about 10 Mc/s.

58·5 Mc/s.

We were pleased to receive an interesting report from Ken Parker, G2ADZ, of Oswestry. Following up his pre-war activity on 56 Mc/s., he has been active on the band *every day* since August 20th, 1947, even if only to put out a few CQ's. For those who would like a QSO with Shropshire, his frequency is 58·728 Mc/s. He calls CQ daily—with his beam in the London direction—between 1900 and 1915 GMT. ADZ certainly had a first class introduction to the band back in August when his first CQ raised G8SM at 168 miles and was heard by a listener in Schleswig Holstein. The same listener reported him at 579 during the second 5 metre NFD in September, and at the same time heard G3BM/P, 3BY/P and 3MY/P.

On the subject of conditions generally, he says that stations were workable up to 90 miles any night during January, with an increase in range to about 170 miles under the anticyclonic weather conditions at the beginning of February, and complains that it is more often lack of activity than poor conditions which makes the band sound dead. He relies on weather reports and the reception of BBC harmonics to judge conditions, and urges operators to listen to the forecasts either of the BBC or "Airmet" and form their own conclusions. 2ADZ, by the way, uses a battery O–V–1 and a three-element beam.

G5MP from behind the South Downs at Hythe, Kent, sends a welcome report. He spends a fair amount of time on the band, but during 1947 heard only five G stations—owing to the requirement of exceptional propagational conditions to overcome his heavy local screening—but over the same period on 50 and 58 Mc/s. he heard ten countries plus three American districts. F8NW and ZF are his "locals," and they are always on between 20.00 and 21.00 G.M.T. G3YH, in Bristol, heard 2NH, 3BLP and 5MA on January 25th, and worked 5US of Camberley on February 15th and 18th. Many old timers will remember Dick Lee of Heathfield, Sussex, when he was BRS1073 in those days. He seemed to hear everything of interest on no matter what band. Nowadays, under the call 2HLF he puts in a lot of time on the band using a 66 foot end-on aerial. He says that he has a good location, which seems to be borne out by the fact that during the month he had six contacts with 2BMZ (Torquay). He also worked 3AUS of the same town and 5ZT of Plymouth. 8LY, worked at 2YL, is now using a rotary beam 17 feet high, but she does not anticipate getting out so well from her sea-level QTH at Lee-on-Solent as from Winchester.

A recent QSO with G3NR of Kings Langley enables us to give further information regarding his sked. with F8ZF of Boulogne mentioned last month. Since July he has heard the French station 191 times out of a possible 196 and has effected contact on no less than 163 occasions. This, we feel, must be one of the most consistent skeds ever kept over such a distance (130 miles), and we offer our hearty congratulations to both operators. Readers may be interested in details of his receiver, as it is certainly of advanced design, and entirely home built. EC52 neutralised triode first RF, EF54 second RF, 954 mixer, 955 oscillator, EF50 first IF at 5 Mc/s., 6K8, with crystal controlled oscillator section as second mixer, two stages of 465 kc/s. IF using EF39's, diode detector, one AF stage and BFO.

144 Mc/s.

G2WS has completed his C. C. transmitter and is now aiming higher. G2NH's exciter uses an EF50 tritet to reach 24 Mc/s. from either a 6 or 8 Mc/s. crystal, followed by a 6V6 trebler to 72 Mc/s. and a *Mullard* QVO4–7 doubler to 144 Mc/s. He reports that either the metal or the GT/G version of the 6V6 works well in the position mentioned, and has found that greatly increased output results from increasing the bypass condensers in the 144 Mc/s. section of the exciter from 500 to 1,000 pf.

420 Mc/s. and 2300 Mc/s.

G4CG of Wimbledon sends a report of a U.H.F. Group meeting held on February 1st to discuss matters of interest on the above bands. It was suggested that at least at first, operation be confined to 430 to 440 Mc/s. in view of (a) the difficulty of searching, (b) aerial design to cover such a wide range as 420 to 460 Mc/s., and (c) the possibility of tripling from the two metre range. A valve list for 2,300 Mc/s. is being compiled. Frequency measurement on this band is to be the first consideration.

General.

Please send written reports by March 23rd. G2UJ will be on 58·54 Mc/s. looking for news from 1800 to 1930 BST on Sunday, March 21st, and from 2200 to 2330 BST on Monday, March 22nd.

Contest Flash

Those taking part in the first part of the R.S.G.B. 1948 5 Metre Contest were rewarded with the best conditions experienced on the band for months past. G2AJ, working portable on the Dunstable Downs in Bedfordshire, 750 feet a.s.l., put up a remarkable performance. Operating only between 15.00 G.M.T., Saturday, and 20.30 G.M.T. on Sunday, he made no less than 81 contacts with 23 counties, including 17 with stations more than 100 miles distance. His best DX was with G5BY (176 miles), 2BMZ (161 miles) and 2IN (158 miles). G5GX, Hull (132 miles), was the most consistant signal, being fully readable at any time, day or night. 2AJ acknowledges with thanks the co-operation he received for these tests from 2AHC and 6SB, of *Palace Electrical*. 2XC worked 22 counties and had the satisfaction of hooking 5GX of Hull at over 200 miles. 2AUA and 3HDJ put Northampton on the map, while several Lancashire stations put in a welcome appearance.

Valves for N.F.D.

Messrs. Standard Telephones & Cables advise us that they have available ex-stock a battery-operated beam tetrode type 3D6 suitable for use as a Class C amplifier up to a frequency of 50 Mc/s. It furnishes 2·5 watts output for an input of 4·5 watts. The filament is rated at 1·4 volts 0·22 amps or 3·8 volts 0·11 amps. Data sheets will be supplied on application to *Standard Telephones & Cables*, Foots Cray, Kent. Valves should be ordered *via* retail channels price 9/– each + 3/– P.T.

TOP BAND CONTEST 1947.

SECOND AND COMBINED SECTIONS RESULTS

TEN THOUSAND QSOs in 12 hours! Was that a record set up by those taking part in the Second Section of the Top Band Contest? Hundreds of skilfully manœuvred VFOs and every possible dodge, coupled with good operating standards and brevity, were employed in an event that should go down in history for the keenness and—above all—the friendly rivalry of all contestants. An excellent spirit prevailed throughout.

Everyone concerned is to be congratulated on the ever-improving accuracy and clarity of their entries. The high operating standard and care shown are indications that recent warnings by the Contests Committee—who have been criticised in the past for the thorough manner in which they have checked logs—have been taken to heart and have had the desired effects. For the few who do not maintain this standard we repeat previous remarks. The declaration must always be signed with the full wording and the entry must be posted within the time limit. Reports not acknowledged, lack of a suitable recording display of stations already worked and careless listening, are the sources of many lost points, to say nothing of time.

General Remarks

Conditions on the whole were good although distant stations were not received at exceptional strength. Several competitors noticed that during the "small hours" stations in different parts of the country peaked and then faded out; QRN became fairly heavy for a short period but did not seem to be very troublesome.

The 12-hour operating period was considered satisfactory by most entrants, two, however, thought that a later start and a further shortening of the total period would be desirable.

A clash with the VERON Contest was regretted but could not be avoided as details of that event were received rather late. In this connection it should be recorded that the Hon. Secretary of the Contests Committee spends a good deal of his time trying to keep other national societies informed of R.S.G.B. contest dates.

One Midland operator is still under the impression that stations in congested areas are at an advantage by being able to make a large number of local contacts. An examination of the scores, location and logs of the leading stations will, however, soon dispel such an idea. It would probably be more correct to say that the isolated operator has an advantage over one in a congested area because the later has his ears constantly ringing with hosts of S9 signals. It is appreciated by the Committee that remote stations may be at a disadvantage under the present scoring system. For example, the lack of GM signals was marked. Suggestions from members in GM, GI, GC and other remote areas would be welcome. Incidentally, G contestants expressed their appreciation of the outstanding operating of OZ1W and D2KW. Both radiated good signals and both were received well in all parts of the country. OZ1W worked 83 stations and is to be congratulated on his excellent log. Some OK stations were also active but were not heard by many G's.

Some competitors asked how certain stations managed to radiate such outstanding signals. The answer seems to be "long aerials," which are becoming the vogue on this band. One leading station employs two long wires which are chosen according to the position and distance of the station to be worked.

VFO v. Crystal

One entrant remarked that there were so many crystal controlled signals on the band that the few VFO notes could easily be identified. As a matter of interest the following is an analysis of the logs: 22 employed crystals, 29 used ECO's, 12 Franklin Oscillators, 4 Hartley Oscillators, 1 a Colpitt, and 29 just said VFO. The VFO's thus win the day with a score of 75 to 22. To comply with licensing conditions, care must be taken to record transmitting frequencies.

QMF

The use of this Q signal introduced in 1946 for contests has become so well established that according to one entrant it can now almost be taken for granted. Bunching was hardly noticeable and several operators remarked on the continuous flow of contacts following one short call. For the future it is suggested that CQ calls should be restricted to about 30 seconds duration. A few competitors indulged in very long—seeming everlasting—calls.

QRP

G6ZN who was the winner of the QRP contest showed that low power can hold its own on this band. Using only 3 watts from batteries to a single 2 volt valve in a Hartley circuit, and despite receiver trouble at the beginning of the contest, a high score was obtained.

The Leading Stations

Mr. J. A. Hunt, G2FSR, of 2 Parkhill Road, Chingford, London, E.4, was the leading station in this Section with 127 points. He also shared second place in the First Section and thus has the highest combined score making him the winner of the Somerset Trophy. He employed a Franklin VFO with 10 watts input to a 6V6 P.A., 130 ft. aerial, 40 ft. of which was down lead, plus a 50 ft. counterpoise. Receiver RCA AR88.

Mr. H. J. M. Box, G6BQ, of 52 Cobham Street, Gravesend, takes second place with a score of 124. 6BQ has been a leading station in practically every top band contest since 1935 and is well known for his high quality signal and excellent operating. He used a 6L6 ECO—6L6G Trebler—to a 6L6G P.A. at 10 watts. When a long wire Marconi aerial was used the tuning was ganged over the whole band. An alternative aerial was a ½ wave, centre-fed Zepp. Receiver—home made 11 valve superhet.

Messrs. A. W. Gover, G4AU, and D. N. Biltcliffe, G6NB, share third place, each having a score of 117 points.

The complete list of entrants in order of merit is as follows:—

Psn.	Call Sign.	Points.	Psn.	Call Sign.	Points.
1	G2FSR	127	44	G3CHY	72
2	G6BQ	124	46	G2DBW	71
3	G4AU	117	47	G6WH/A	69
	G6NB	117	48	G2HAP	68
5	G5MY	116		G4GA	68
6	G6HD	112		G5QU	68
7	G2DU	111		G8BM	68
	GW5OD	111	52	GW2HH	66
9	G5RI	110		G2SO	66
10	G2JL	107		G5UH/A	66
11	G8VR	106	55	G5JF	65
	G8DV	106	56	G3MA	63
13	G2LC	104		G4FB	63
	G3GX	104	58	G2GA	62
15	G3AFZ	101		G2PT	62
16	G5TO	100		G6UT	62
	G5ZX	100	61	G5FY	59
18	G2MI	99	62	G3BKF	58
19	G6HU	96		G2HDJ	58
20	G6ZN	94	64	G2SF	55
	G8WF	94	65	G2RD	54
22	G2NJ	93	66	G2FAQ/A	50
	G3VB	93		G4MU	50
24	G6VC	92	68	GM4FK	49
25	G5PR	91		G6AB	49
26	G6CT	90	70	G8NF	47
	G2HP	90	71	GM6RI	46
28	G3ABG	89	72	G4BC	44
29	G3AEX	86	73	G2BOU	41
	G3AKY	86		G6IO	41
	G8JI	86	75	G3BDV	40
32	G2FMF	85	76	G2CWY	39
	G2HW	85	77	G2AAU	37
34	G3AAB	84	78	G4QU	36
35	G3AIG	83	79	G2FWA	34
36	G3AKF/A	82	80	G6FJ	31
37	G3ARS	80	81	G2CLD	30
	G6GM	80		G3BWR	30
39	G3BRA	78	83	G5JL	25
	G8SG	78	84	G2XG	24
41	G5JO	77	85	G3NT	22
42	G2WQ	75	86	G3ALG	14
43	G3CO	74	87	G3CAZ	11
44	G2DAN	72	88	G4DV	7

G8JM and G2HPF with claimed scores of 89 and 87 points, respectively, posted their logs after the closing date.

The Contests Committee thank G2BMI, 2GN, 2HR, 3AZD, 3BBF/A, 3BLP, 3CAG, 4GT, 5AO/A, GW5BI and 8JP, for their valuable check logs.

Result of Combined Sections

The winner of the Somerset Trophy is the entrant with the highest combined score of the two events in 1947. As well as winning the Second Section Mr. J. A. Hunt has the highest combined score of 213 points and is declared the combined winner.

The order of the other stations who entered for both sections is as follows:—

Psn.	Call Sign.	Points.	Psn.	Call Sign.	Points.
1	G2FSR	213	16	G8WF	164
2	G6BQ	205	17	G2WQ	151
3	G5MY	201	18	G6ZN	146
4	G2DU	197		G3ABG	146
5	G4AU	194	20	G3CO	137
6	G5RI	193	21	G6WH/A	127
7	G6HD	186	22	G3ARS	125
8	G2LC	183	23	G5QU	121
9	G5ZX	182		GW2HH	121
10	G2MI	181	25	G6UT	106
11	G3GX	178	26	GM4FK	98
12	G3AFZ	175	27	G2SO	95
13	G5PR	170	28	G5JF	84
	G6VC	170	29	G2AAU	74
15	G8VR	166	30	G4MU	70

SECOND FIVE-METRE CONTEST

DECEMBER 6th—7th, 1947

AFTER a period of three or four weeks, during which many of the prominent 5 metre stations had migrated to the temporary six metre band, it was indeed a welcome sound to hear the 58·5 to 60 Mc/s. part of the spectrum full of signals again. An entry of 51 was considerably more than that for the first five metre contest held in March, 1947. In point of fact some 140 stations in 28 counties were active during the week-end. One London station worked more than 50 stations in the first twelve hours—a good indication of the activity during the Saturday afternoon and evening.

The scoring system, which was similar to that used for the field days with the addition of the County bonus, met with general approval. One entrant thought that the County bonus gave some advantage to stations located just North of London and in the Midlands, but an examination of the logs shows that this was not the case.

The general standard of the logs was good, although, as always, several scores had to be amended. One or two entrants made rather optimistic assessments of mileage, and two unfortunately claimed a bonus of 10 points for their own county ; this of course was not permissible.

The Contest Committee was pleased to receive more logs from Northern stations than after the first contest, many of the operators putting in several hours of listening before hearing a signal.

The Leaders

The winner, Mr. M. D. Mason (G6VX), of Hayes, Kent, is to be congratulated on an outstanding performance, his score of 472 points (21 counties worked) being 68 points ahead of the runner-up, Mr. N. H. R. Munday (G5MA), of Ashtead, Surrey, who scored 404 points. Neither need any introduction to those who are active on five metres. Both use the very best equipment, and both stations are operated by men who have the uncanny knack of " pulling in " weak DX that no one else can hear from the noise. Mention should also be made of the excellent performance put up by Mr. W. R. Eadie (G4JO), of Torquay, Devon, who finished third with 375 points. The fact that out of his 33 contacts only seven were at distances of less than 100 miles is a measure of his achievement.

Equipment Used

Of the equipment used by Mr. Mason, his receiver is worthy of special note. This consisted of a wide band crystal controlled convertor feeding an HQ-120X receiver, the convertor using a 6J6 RF stage and another 6J6 as mixer and crystal oscillator. This type of convertor may well be the answer for those of us who are still looking for a receiver for the new 144 Mc/s. band. Mr. Mason's transmitter consisted of a QVO4-7, followed by another QVO4-7 into an LS50 in the P.A., at 25 watts input. His aerial was a 4-element wide spaced beam, 50 feet high.

For receiving, Mr. Munday used the same modified HRO that has brought him such good results in past contests, with a 954 in the first RF stage and EF54 in the second. His transmitter consisted of a 6V6 as crystal oscillator, followed by a 6L6 quadrupler and an 807 doubler driving the 35T in the P.A., at 25 watts input. His aerial was a 3-element close spaced beam, 45 feet high.

Mr. Eadie used the conventional EF54–EF50–955 line-up in a convertor feeding into an HRO. His transmitter was a 6L6–807–832, and the aerial a 4-element wide spaced beam.

Summary of Conditions

Considering the time of year, conditions throughout the week-end were undoubtedly above average, especially during the Saturday evening and Sunday. It was unfortunate, as several stations remarked, that the contest did not take place one week later, when conditions were exceptional, but even so a considerable amount of DX was worked.

During the Saturday afternoon conditions were poor and most of the contestants spent the time working locals and accounting for the nearby counties. G6XM (Farnborough, Hants), appears to have been the first Southern station to work to the North. His contacts with G2ADZ (Oswestry, Salop) at 1520 G.M.T. followed by G4OS (Chester) at 1640 G.M.T., were the first of several North-South contacts to be made. Soon after 1630 G.M.T. signals from G4JO (Devon) made their appearance in the London area, and his contacts with the winner, G6VX, at 1645, followed by G5MA (Ashtead, Surrey) and G2AJ (Hendon, Middlesex), were the first of a series of DX contacts which he made, lasting until 0145 G.M.T. on Sunday, when he was still RST 569 with G2FKZ (Dulwich, London). During Sunday he was audible in London most of the day, and his contacts with G8UZ (Notts) and G3BXE (Cambridge) were the only two contacts over 200 miles made during the contest. Conditions for North-South contacts were best between 1830 and 2030 on the Saturday and again intermittently throughout Sunday, peaking during the last hour and a half of the contest. On Saturday evening the winner worked G3APY (Notts), G6YU (Coventry, Warwickshire), G2ADZ (Oswestry, Salop) and G3ZK (Halifax, Yorks) in just over 90 minutes, followed at midnight with G6OS (Hull, Yorks) and G2ATK (Shirley, Warwickshire). G5MA worked G2ADZ and G4LU, both in Oswestry, and several other stations worked G2ADZ and G3APY during the evening.

For those stations who had been active on Saturday, Sunday was a day of careful listening for new stations and counties. G6VX as usual found something new, and added four new counties during the day, in addition to fresh contacts with G8UZ and G6MN/A in Notts and G3ABA in Warwickshire. His additional counties were G6VD (Leicester), G2AOK/A (Glos.), and G5BD (Lincs.). His QSO with G4DS/A (Derby) at 2320 was the only contact made with that county from the South. G5MA, who was active throughout Sunday, brought his counties worked up to 18 by contacting G2RI (Leicester), G3PZ (Glos.), G8UZ and G3APY (Notts), and G6YU (Warwickshire). During the evening the latter gave several London stations their only Warwickshire contact.

Although conditions in the North appear to have been poor for DX compared with the South, it was possible to work some DX on both days, as is shown by the log of G3ZK. His contacts with G6VX, G3BLP (Selsdon, Surrey), G2FKZ (Dulwich, London), and G3BXE (Cambridge), are all excellent examples. The Hull stations were a little less fortunate, although G6OS did work G6VX and G3BXE.

Stations in the South will be interested to learn that no fewer than six GW stations were active in and around Llandudno, but no contacts were made outside that area. GW3JI is thanked for this information, and it is hoped that by the time the next contest comes along they will have beams in operation and be working plenty of DX.

The Contests Committee wishes to thank all those who took part in the event and especially those who sent letters with comments, both adverse and favourable. Information on stations heard, even though not worked, is always useful, as this helps to give an idea of general conditions. Check logs are most helpful, and the following are thanked for submitting them :— G3CU, GW3JI, G4CG, G4DS/A, G6DH, G6LX, G6YU, and G2FUU. BRS3003 submitted a listening log.

A list of contestants in order of merit follows :—

Position	Call Sign	Points	QTH
1	G6VX	472	Hayes, Kent.
2	G5MA	404	Ashtead, Surrey.
3	G4JO	375	Torquay, Devon.
4	G3BLP	358	Selsdon, Surrey.
5	G6XM	347	Farnborough, Hants.
6	G2MR	342	Surbiton, Surrey.
7	G2ADZ	341	Oswestry, Salop.
8	G6LK	339	Cranleigh, Surrey.
9	G8WV	330	Hanslope, Bucks.
10	G2AJ	322	Hendon, Middlesex.
11	G3APY	306	Kirkby-in-Ashfield, Notts.
11	G2XC	306	Portsmouth, Hants.
13	G2YL	299	Walton-on-the-Hill, Surrey.
14	G3BXE	297	West Wratting, Cambs.
15	G2FKZ	287	Dulwich, London.
16	G4NT/A	279	Downley, Bucks.
17	G5RP	277	Abingdon, Berks.
18	G2NH	266	New Malden, Surrey.
19	G6OH	261	Sunninghill, Berks.
19	G8UZ	261	Sutton-in-Ashfield, Notts.
21	G4IG	256	Beckenham, Kent.
22	G5PY	255	Clapham Park, London.
23	G4AP	251	Swindon, Wilts.
24	G2KG	235	Chelmsford, Essex.
25	G8SM	210	East Molesey, Surrey.
26	G8TS	208	Farnham, Surrey.
27	G3ZK	207	Halifax, Yorks.
28	G2WS	203	Beckenham, Kent.
29	G2CIW	196	Brentwood, Essex.
30	G3BWS	189	Gillingham, Kent.
31	G3BK	184	March, Cambs.
31	G5IG	184	Cambridge, Cambs.
33	G2KF	182	Edenbridge, Kent.
34	G6MN/A	160	Worksop, Notts.
35	G5LQ	153	Chiswick, London.
36	G2NM	148	Bosham, Sussex.
36	G6LL	148	Cuffley, Herts.
38	G5JU	145	Birmingham, Warks.
39	G2UJ	123	Tunbridge Wells, Kent.
40	G8PX	119	Oxford, Oxon.
41	G3ABA	114	Coventry, Warks.
42	G6VC	106	Northfleet, Kent.
43	G5LO	104	Stanton Harcourt, Oxon.
44	G5MR	100	Felpham, Sussex.
45	G6OS	93	Hull, Yorks.
46	G6VD	84	Leicester, Leics.
47	G3BY	75	Ashton-U-Lyne, Lancs.
48	G2HFD	59	Bermondsey, London.
49	G2FWA	56	Croydon, Surrey.
50	G3COJ	44	Hull, Yorks.
51	G3YH	14	Bristol, Glos.

LETTERS TO THE EDITOR

Television and BCL Interference

DEAR SIR,—May I draw your attention to the growing concern which is felt by amateurs on the subject of television and BCL interference by amateur transmissions ?

At present, the situation, in respect of BCL interference, is that the amateur concerned attends to the receiver and in most cases cures the trouble, otherwise the G.P.O. are called in. In the case of television interference, current practice seems to be for the particular amateur concerned to be requested to cease transmission during television hours until the G.P.O. can give the matter their attention. This is a most unsatisfactory state of affairs as it shows that the G.P.O. are biased in believing that the cause of the interference lies solely with the transmission concerned and not with the poor design of the television receiver.

Except in the case of third harmonic radiation by 14 Mc/s. stations, it is extremely unlikely that any amateur transmission actually radiates frequencies in the broadcast band or on television receiver frequencies. The main reason for tunable amateur signals on broadcast receivers is the fact that the local oscillator in the receiver concerned is of poor design and so rich in harmonics that the " umpteenth " harmonic beats with the short wave transmission concerned to produce a signal in the receiver. In other cases it is a question of cross modulation, and again the interference is not due to any maladjustment on the part of the transmitter but solely to the poor design of the receiver concerned. In the same way with television receivers where the problem is more acute due to the wide band-width R.F. input. A signal from an amateur on 28 Mc/s. or 56 Mc/s. will, if sufficiently close to the television receiver, produce voltages in the set to cause interference with reception. However, this trouble could, in most cases, be alleviated if the manufacturers were not content with a response curve with very wide skirts, but designed a suitable band pass filter circuit between the aerial and first R.F. stage of the television receiver.

At present, very little progress has been made by the G.P.O. in solving this problem and a number of stations are not transmitting during television hours. This admittedly shows a good spirit of co-operation on the part of the amateurs concerned, but in view of the possibility of television transmitting times being extended, the effect on amateur radio may be rather drastic.

May I suggest, therefore, that the G.P.O. be requested to lay down standards in terms of micro-volts per meter at a nominal distance from the transmitter concerned for amplitudes of frequencies radiated by amateurs in the band 200 kc/s.—1,500 kc/s. and 40—46 Mc/s. ? If it can be shown that no emissions are made on these frequencies, then any interference caused to television or BCL transmissions are not the responsibility of the amateur. Indeed, they are due solely to poor design of the receivers concerned. I consider that if this attitude is pressed strongly enough by the R.S.G.B., manufacturers may take note and improve designs accordingly. Doubtless, most amateurs will continue to co-operate by providing chokes, etc., but at least the public should be made to realise, in appropriate cases, that it is a favour to the listener and not a favour by him to permit the fitting of chokes so that the amateur may continue his hobby.

In addition, I should like to suggest that a small Technical Panel be set up in conjunction with the G.P.O. to study interference and make recommendations accordingly to all interested bodies.

Yours faithfully,
N. G. V. ANSLOW,
Assoc. Brit. I.R.E., G4GD.

35 Gilpin Avenue, East Sheen, London, S.W.14.

Car Ignition Suppression

DEAR SIR,—I was interested to read the editorial regarding automobile ignition interference. It is about time that something was done to tackle this problem. On medium waves one can usually avoid the noise caused by vacuum cleaners and the like by improving one's own aerial system or by visiting neighbours and then fitting the usual condenser, but motorists are a " hit and run " crowd—they are gone before you can catch them !

Car owners seem to like sticking labels on their windows and I suggest that a sticker of some sort might help. One that comes easily to mind : " This car does not interfere with Television—does yours ? "

Regarding the actual technical details of the suppressor, I believe that one firm (Morgan Crucible Co.—I think) make a device which is fitted without cutting any wires or adding anything which dangles about and imperils the car's reliability. The gadget is a special H.T. pick-up brush made of carbon, having special characteristics to give an inherent resistance of 5,000 ohms or so. I understand they are very effective, being right at the source of the spark. On my own car I use one Erie type S5 10,000 ohms distributor suppressor and four Erie type L2 15,000 ohm plug suppressors. This is quite effective even on the 80 Mc/s. band when a receiver of 1 microvolt sensitivity is brought very close to the car. If the distributor brush type suppressors are available they could be fitted as easily and probably as cheaply as the ordinary type.

I hope these suggestions may be of some use and I trust that when the local television station at Sutton Coldfield does start up the suppression business will be in hand.

Yours sincerely,
ARTHUR JAMES, BRS6738.

105 Forfield Road, Coventry.

Aerials for V.H.F.

DEAR SIR,—I have noticed considerable concern amongst the V.H.F. enthusiasts in recent weeks about the type of polarisation which will be used when licences for the 144 and 420 Mc/s. bands are obtained. It has even been suggested that meetings should be called at an early date for the purpose of deciding whether horizontal or vertical aerial arrays shall be used.

It would be a great pity if any action were taken in this way which for purely arbitrary reasons would predetermine the method of propagation to be used on these bands. The 2 metre and 70 cm. regions of the spectrum will provide for us opportunities for original investigation unequalled by anything which the amateur has been offered in recent years and the relative merits of horizontal and vertical propagation at various ranges is one of the most important and interesting problems to be tackled.

Many years ago the few enthusiasts who carried out pioneer work on 56 Mc/s. used vertical and horizontal arrays almost equally. It was most regrettable that in 1946, a few stations started the "fashion" for horizontal systems and the rest followed. As a result, little is known of the characteristics of other modes of propagation on that band.

Aerial arrays for 144 and 420 Mc/s. will be so compact that with a little ingenuity they can be made to swing from the vertical to the horizontal position at will. Let it be hoped that those who decide to use the new bands, if and when they are available, will do so in a spirit of experimental enquiry and that such adolescent pastimes as competing to work maximum numbers of counties will be replaced by an endeavour to achieve something really worthwhile.

Yours faithfully,
W. A. SCARR (G2WS),
Executive Vice-President R.S.G.B.

8 Beckenham Grove, Shortlands, Kent.

New Books

RADIO QUESTIONS AND ANSWERS. Vol. II, Radio Receivers. By E. M. Squire. Sir Isaac Pitman & Sons, Ltd. 152 pp., 8vo. Price 10/6.

This second volume of *Radio Questions and Answers* is designed to assist students who have received some training in basic radio (covered in Vol. I) and are preparing for radio servicing examinations. The questions and answers cover not only theory but also elementary practical receiver design.

Several of the questions are, to use a colloquialism," tricky," in the sense that they require thinking about. These are the kind that have a happy—or unhappy—knack of turning up in examination papers and are the ones that frequently " floor " a candidate.

Random questions—" What is selectivity ? Explain a selectivity curve." " The second grid of the heptode is in the form of rods. Why is this ? " " How much gain would you expect from a phase inverter ? " " Compare the merits of an inductance input filter with a condenser input filter."

There seems little doubt that this book, which is illustrated with 146 informative and well drawn line diagrams—will rapidly find favour with those radio service men who are anxious to make progress in their profession. J. C.

Public Schools Exploring Society

Applications are invited for the post of Officer in Charge of Wireless Telegraphy for the Northern Quebec Expedition, 1948, leaving on August 4 next and sailing from Quebec on the return voyage on September 25. The entire cost to each member will be £130 plus about £10 10s. for equipment.

The Expedition, led by Major G. F. Spooner, R.Fus., is for boys of 16 to 18 years of age and will include those from Public and Secondary Schools and Cadets from the Services.

Full details are available from Surgeon-Commander G. Murray-Levick, R.N., Hon. Chairman, P.S.E.S., White Barn, Old Oxted, Surrey.

Many well-known amateurs attended the first meeting of the South London V.H.F. Group held on February 1. Discussion centred around the 420 and 2,300 Mc/s. bands.

NEWS FROM HEADQUARTERS

COUNCIL, 1948

President:
VICTOR M. DESMOND, G5VM.

Executive Vice-President: W. A. Scarr, M.A., G2WS.
Hon. Secretary: K. Morton Evans, O.B.E., G5KJ.
Hon. Treasurer: A. J. H. Watson, F.S.A.A., G2YD.
Hon. Editor: Arthur O. Milne, G2MI.
Immediate Past President: S. K. Lewer, B.Sc., G6LJ.

Members: I. D. Auchterlonie, G6OM, G. F. Bloomfield, Ph.D., A.R.I.C., G2NR, F. Charman, B.E.M., G6CJ, D. N. Corfield, D.L.C.(Hons.), A.M.I.E.E., G5CD, C. H. L. Edwards, A.M.I.E.E., G8TL, R. H. Hammans, G2IG, J. W. Mathews, G6LL.

General Secretary: John Clarricoats, G5CL.

G.P.O. Liaison Officer: Arthur E. Watts, G6UN

January Council Meeting

Resume of the Minutes of a Meeting of the Council of the Incorporated Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, January 13, 1948, at 6 p.m.

Present.—The President (Mr. V. M. Desmond in the Chair), Messrs. Auchterlonie, Bloomfield, Charman, Corfield, Edwards, Hammans, Lewer, Mathews, Milne, Scarr, Watson, Watts and John Clarricoats (General Secretary).

Apology for Absence.—An apology for absence was presented on behalf of Mr. Morton Evans.

Wyllie Library.
Resolved to purchase for the sum of £30, 17 bound volumes of the BULLETIN, 13 bound volumes of QST and other radio books —part of a library formed by the late Mr. J. Wyllie, GM5YG.

Courteney Price Trophy.
Resolved to award the Courteney Price Trophy to Mr. F. A. Robb, G16TK, in recognition of his achievement in leading the U.K. entrants in the 1947 A.R.R.L. DX Telegraphy Contest.

Six Metre Licences.
Mr. Watts gave details of the arrangements which had been made by the G.P.O. to issue 6 metre licences (see notice in January issue of the BULLETIN).
Resolved to send advance copies of the notice to *Wireless World*, *Practical Wireless*, *Electronic Engineering* and *Short Wave Magazine*.

Television Interference.
It was reported that a memorandum dealing with Amateur Interference to Television had been drawn up by a Sub Committee of R.I.C. and forwarded to B.R.E.M.A.

1947 *B.E.R.U. Contests.*
Resolved to award miniatures of the B.E.R.U. Trophies to the leading R.S.G.B. members in the Senior and Junior sections of the 1947 B.E.R.U. Contests. The actual winners were not members at the time of the Contest and, therefore, were not eligible to receive trophies.

Headquarters Station.
It was reported that the licence had now been issued and the aerial poles erected. Certain firms had been invited to quote for an aerial coupler and for the installation of the aerial system.

Affiliated Society.
Resolved to grant affiliation to the Laurel Lodge Radio Club (Belfast).

Membership.
Resolved to elect 176 Corporate Members, 45 Associates and 22 Junior Associates. Mr. David Mitchell, GW6AA, applied for and was granted Life Membership. Six Associates applied for and were granted Corporate Membership.

Committee Meetings.
Resolved that the Society shall pay for the cost of refreshments taken by Committee members who attend evening meetings.

Terms of Reference of Committees.
Terms of Reference for all Committees of the Council were approved.

Official Regional Meetings.
Resolved to hold O.R.M.'s in Regions 1, 3, 5, 7, 9, 11, 13 and 15 during 1948, and in Regions 2, 4, 6, 8, 10, 12 and 14 during 1949.

Delegates' Conference.
Resolved by 5 votes to 4 to enquire from the management of the Imperial Hotel, Birmingham, whether they can accommodate a Delegates' Conference during the Spring of 1948.

Several Members expressed the view that as many of the R.R.'s had only recently taken office for the first time it would be advisable to defer the meeting for one year.
(The Council has now resolved not to hold a Delegates Conference during 1948.—ED.)

Committees of the Council.
The Committees of the Council for the year 1948 were constituted (see list in February issue of the BULLETIN).
Resolved not to reconstitute the Social Committee for the time being.

Contests.
An amended Contests programme for the current year was approved.
The view was expressed that by reducing the number of Contests the work of the Contests Committee would be lightened. Additionally more space would be made available in the BULLETIN for technical contributions.

Licence Matters.
Matters relating to a proposal by the G.P.O. to amend the form of licence issued to amateurs were discussed and certain recommendations of the G.P.O. Liaison Committee approved.
The meeting terminated at 10.5 p.m.

Slow Morse Practice Transmissions

It is proposed to revive publication of the schedules of Slow Morse practice transmissions which were a feature of the BULLETIN two years ago.
Members who are making regular practice transmissions are asked to send the following details to Mr. C. H. L. Edwards, G8TL, 10 Chepstow Crescent, Newbury Park, Ilford, Essex.:-
Call Sign, Times (G.M.T.), Day, Frequency, Speeds.

* * *

Mr. S. C. Mitchell, BRS15819, informs us that practice transmissions are radiated by PA0AA (V.E.R.O.N. Headquarters' station) between 8 p.m. and 10 p.m. on Wednesday evenings. Frequency 3·62 Mc/s. The announcements are made in Dutch.

Six Metre Permits

Although nearly 400 members applied through their Regional Representative for permission to use the 6 metre band, only 60 took advantage of the facility offered when the terms and conditions became known. Furthermore, only 23 of the 42 who were granted permission, last November, to use this band, applied for a renewal of their permit.
It is appreciated that the condition which restricts the hours of operation has been responsible for the decision of many London and Home Counties members not to apply, nevertheless, in view of the critical comments made after the original announcement appeared in the BULLETIN, the Council feels that the above facts should be placed on record.

Town Representation

The following are additions or amendments to the list o T.R.'s published as a Supplement to the February issue.

Region 2.—YORKSHIRE.
Middlesbrough .. H. Walker, G3CBW, 9 Chester Street.
Scarborough .. H. P. Wiggins, G2CP, 5 Belgrave Terrace.

Region 3.—SHROPSHIRE.
Wellington .. T. L. Stevens, G3XV, Donnington Wood.

Region 3.—WARWICKS.
Rugby .. .. C. H. Walker, G3AZT, 12 Rowland Street.

Region 7.—LONDON, NORTH.
Watford .. R. T. Youens, G2HAR, 104 Baldwins Lane, Croxley Green.

Region 7.—LONDON, WEST.
Hayes Area .. A. W. Watkins, G3CRK, 2 Cranleigh Gardens, Southall.
Slough .. F. J. Buick, G3XJ, 84 Oatlands Drive.
Staines .. F. G. Lambeth, G2AIW, 21 Bridge Way, Whitton, Twickenham (in place of Mr. R. K. Sheargold).

Region 9.—WILTS.
Salisbury .. C. A. Harley, BRS2109, 85 Fisherton Street.

Region 13.—LOTHIANS.
Berwick-on-Tweed W. Baker, G3AFL, 1 Silver Street.

CORRECTION

Region 8.—KENT.
Tonbridge and Tunbridge Wells F. Barnard, G8FB, 34 Springwell Road, Tonbridge.

Mr. W. Blyth, GM5YX, has been appointed county representative for the Lothians in succession to Mr. P. Hardie now Region 13 representative.

* * *

Due to pressure of private business Mr. A. Garnock Jones, G8TJ, has found it necessary to resign his office as Liverpool T.R. Nominations for his successor should reach Headquarters in prescribed form by not later than March 31st next.

FORTHCOMING EVENTS

REGION 1

Accrington.—April 14, 7.30 p.m., at Cambridge Street School.
Ashton-under-Lyne.—April 4, 2.30 p.m., at New Jerusalem Schools, Catherine Street.
Blackpool.—Every Tuesday, 7.30 p.m., at Shaw Road Garage, S.S.
Bolton.—April 6, 8 p.m., at Y.M.C.A., Bolton.
Burnley.—April 7, 7.30 p.m., at Mechanics Institute, Manchester Road.
Bury.—April 8, 7.30 p.m., Atheneum, Market Street.
April 17, 3 p.m., Mason's Arms, Whitefield, Manchester.
Darwen and Blackburn.—April 9, 7.30 p.m., at Provident Hall (Room 10), Darwen.
Liverpool.—April 3, 2.30 p.m., at 29 Derby Lane, Old Swan.
Manchester.—April 5, 7.30 p.m., at College of Technology, Sackville Street.
Carlisle.—March 19, April 2, 16, 7 p.m., at Richmond Hall, Fisher Street.
Workington.—March 20, April 17, 6.30 p.m., at 31 Washington Street.
Preston.—March 19, April 2, 16, 7.30 p.m., at 3 Tuns Hotel, North Road.

REGION 3

South Birmingham.—March 21, April 4, 18, 10.30 a.m., at Stirchley Institute.

REGION 5

Cambridge.—March 19, 7.30 p.m., at Jolly Waterman. Junk Sale.
Chelmsford.—April 6, 7.30 p.m., at 184 Moulsham Street.

REGION 7

Barnet.—April 17, 7.30 p.m., at Bunny's Restaurant, 15 Station Road, New Barnet.
Croydon R.C. Club.—April 13, 7.30 p.m., at Blacksmiths Arms, South End.
East London.—March 21, 2.30 p.m., Ilford Town Hall (Lambourne Room).
East London.—April 18, 2.30 p.m., Ilford Town Hall. "Impedance Matching."—G6OT.
Edgware.—March 17, 24, 31, April 7, 14, Orchard Cafe, Broadway, Mill Hill.
Enfield.—March 21, 3 p.m., at A & B Cafe, Southbury Road, (Junction with Ladysmith Road). "R.T. Transformers"—G2DLX.
Enfield.—April 18, 3 p.m., Ditto. "Test Gear."—G8KO.
North-West Kent.—April 2, 7.30 p.m., at Aylesbury Road School, Bromley.
Peckham.—April 5, 7.30 p.m., at The Kentish Drove, Rye Lane (Next Jones & Higgins).
Ruislip.—March 18, 25, April 1, 8, 15, 7.30 p.m., at Oddfellows Hall, Waxwell Lane, Pinner.
Southgate.—April 2, 7.30 p.m., at Merryhills Hotel (Near Oakwood Station).
St. Albans.—March 23, April 20, "The Beehive," London Road.
Welwyn Garden City.—April 6, 8 p.m., at Council Offices.

REGION 8

Bournemouth.—April 1, 8 p.m., at Cricketers Arms, Wyndham Road.
Brighton.—April 5, 7.30 p.m., at Golden Cross Hotel, Western Road. April 19, Ditto. Film Show.
Eastbourne.—April 2, 7.30 p.m., Friends Meeting House, Wish Road. "Introduction to Electronics, Part I."
Portsmouth.—March 29, S.H.R.T.S., 7.30 p.m., at Cosham Civic Centre.
Worthing.—April 1, 7.30 p.m., Olivers Cafe, Southfarm Road, "Introduction to Electronics, Part I."

REGION 9

Bristol.—April 2, 8 p.m., at Star Inn, Rhodyate, Nr. Bristol. Dance—Running Buffet.
Bristol.—March 19, 7.15 p.m., at Keen's Cafe, Park Row.

REGION 14

Stirling (including Falkirk, Alloa and Larbert).—April 8, 7.30 p.m., at Plough Hotel, Stenhousemuir. Junk Sale.

Bradford Short Wave Club

Due to the unsuitability of the present premises and owing to the fact that at the moment it is impossible to obtain new headquarters it has been decided to disband the Bradford Short Wave Club.

The last meeting was held on February 2, 1948, when the club's assets were realised. A sum of approximately £20 will be given to the Wireless for the Blind Fund.

Bristol Invitation

The Bristol Social Committee are holding a Dance at the Star Inn, Rhodyate, Nr. Bristol, on Friday, April 2, and invite all members in and around that town to support the event, which will commence at 8 p.m.

Transport will be arranged from Bristol and Weston-super-Mare.

Tickets (8/6 each, which price includes buffet refreshments) can be obtained from Mr. A. J. Colley, G8CC, 4 Carnarvon Road, Bristol 6, or Mr. R. Sharp, BRS7961, 112 St. Michael's Hill, Bristol 2.

The Committee trusts this event will be well supported and that it will be the forerunner of many more in the near future.

Bury Film-Show

A Ham-fest and get-together of T.R.'s will take place at the Mason's Arms, Whitefield, near Manchester, at 3 p.m. on April 17. The 1948 R.S.G.B. films will be shown during the afternoon. It is hoped that all East Lancashire T.R.'s will make a special point of attending.

Preston Scientific Exhibition

Some 4,000 visitors to a four-day exhibition arranged during January by the Preston Scientific Society were able to watch a demonstration of amateur radio organised by the Preston Radio Society and the local R.S.G.B. Group. Operating on the 1·8 Mc/s. band with the call-sign G5AD/A many contacts were effected with stations throughout Lancashire.

The transmitter was designed and built by G6FC who was responsible for the radio section of the exhibition. An illuminated mirror placed underneath the chassis enabled spectators to examine the wiring and construction. QSL cards were displayed and the receivers included an AR88 and an Eddystone 640 loaned for the occasion by *Messrs. Stratton & Co., Ltd.*

Great interest was aroused, and the local members are to be congratulated upon the success of the demonstration, especially in view of the high-noise level caused by other electrical exhibits.

Retford Radio Club

Meetings of the newly-formed Retford and District Amateur Radio Club are held on Monday evenings (7.30 p.m.) at the Community Centre, Chapelgate, Retford, Notts. Details can be obtained from the Hon. Secretary, Mr. H. White, G3BTU, 39 Trent Street, Retford.

Southend & District Radio Society

Meetings of the above Society are held fortnightly in Room G, Art Section, Municipal College, Victoria Avenue, Southend-on-Sea, at 7.45 p.m. The next is due to take place on March 26. Full details of the activities of the Society can be obtained from Mr. J. H. Barrance, M.B.E., F.I.I., G3BUJ, 49 Swanage Road, Southend-on-Sea.

At the recent A.G.M., Mr. B. C. Leefe, G5XI, was elected Chairman, G/Capt. H. W. Evens, G6CH, Vice-Chairman, Mr. E. H. Bridges, Hon. Treasurer, and Mr. S. T. Smith, Technical Adviser and Hon. Assist. Secretary.

Staffordshire Get-together

Members in Staffordshire who are interested in getting together for a discussion are invited to write to Mr. D. Poole, G3AQW, 13 Oldfield Avenue, Norton-le-Moors, Stoke on Trent, Staffs, suggesting dates and time. It is proposed to hold the meeting sometime in June.

T.V.A.R.T.S.

Mr. F. Hicks-Arnold, G6MB, speaker at the February meeting, chose as his subject "Transmitter Building." *Mullard Valve Co.* provided a lecturer at the March meeting. The Monday evening (2230 to 2400 G.M.T.) "top-band" schedule is proving an even greater success than was originally anticipated.

The Secretary (Mr. D. R. Spearing, G3JG, 99 High Street, Esher) will be glad to hear from other Thames Valley amateurs who are interested in the activities of his Society.

West Somerset

Members living in West Somerset and interested in the formation of a local group are invited to contact Mr. T. C. Bryant, G3SB, 29 Lower Park, Minehead, Somerset.

York and District Short Wave Club

At the recent A.G.M., Mr. W. Smith, G5WZ, was re-elected Chairman. Others continuing in office are Mr. J. O. Yarker, BRS11543 (Hon. Treasurer), and Mr. G. W. Kelley, G5KC (Hon. Secretary). Messrs. Horner, BRS13887, and Binns, BRS11392, are members of the Committee.

Full details of an interesting lecture and contests programme which has been arranged can be obtained from Mr. Kelley, 123 Kingsway Acomb, York. Meetings are held weekly.

Around the Trade

Overseas members will be interested in the announcement of a new Eddystone receiver intended for "export only." Designed to give good reception of short and medium-wave broadcast stations in any part of the world, it also covers the 28, 14, 7 and 1·7 Mc/s. amateur bands. Circuit features include an EF39 high gain RF stage, a noise limiter, and a 6V6GT output stage delivering up to 3 watts to the console speaker. Good ventilation is provided and all components are tropicalised. A diecast panel and RF coil box form a rigid foundation around which the receiver is assembled. The large directly calibrated dial with a 90 inch logging scale and "Magic Eye" indicator simplifies tuning. Provision is made for use of a doublet aerial and a well illustrated instruction manual contains full service instructions and circuit details.

Two models are being manufactured, the 659/AC for 110 and 200/240 volts A.C. and the 659/B with a vibrator power unit requiring 5·9 amps at 6 volts D.C. Both models are priced at £47 10*s*. Further information is available from *Messrs. Stratton & Co., Ltd.*, Alvechurch Road, West Heath, Birmingham, 31.

Members in the Bradford district are invited to inspect the new Portable Receiver Tester and other measuring instruments which *Marconi Instruments Ltd.* are demonstrating at the Mechanics Institute, Bradford, on March 31 and April 1, from 2.15 to 6.30 p.m. The term "Measurtest" is applied to a new Marconi series of compact, versatile instruments. Although portable and convenient in operation, their performance is comparable with that of the large laboratory types—plus such features as interchangeable mains and battery power units. An exclusive design of panel meter is incorporated so that actual *measurements* can be made on every aspect of receiver performance.

Can You Help ?

Mr. F. L. Harris, BRS11580, 80 Queen's Walk, Ashford, Middx., would appreciate information from any member who has modified the ex R.A.F. R1481 receiver for use on 30 and 60 Mc/s. or higher frequencies.

Mr. W. T. Gould, G3KX, 61 Ashcombe Park Road, Weston-super-Mare, requires details of the Philips 2850 R.A. (reproduction amplifier).

Mr. N. J. Arnold, BRS7122, 14 Midway Road, Leicester, seeks information of the valves and power supply of the midget "Model 3/11" receiver.

Mr. P. Halsted, BRS16714, Holcombe, Cliff Road, Hythe, Kent, is in need of the circuit details of the American ASB4 receiver, indicator and power unit.

Mr. R. J. Donald, G3DJD, 2 Canfield Road, Brighton, 7, has been successfully using an R.A.F. Oscillator Type 145 but requires circuit details.

Mr. R. Stubbs, BRS14794, Rangemore, 62 West Parade, Rhyl, wishes to obtain details of the coils used in the Hallicrafter XS15.

Mr. D. A. Samson, BRS16323, 56 Elm Row, Edinburgh, 7, would welcome suggestions on fitting an "S" meter, crystal filter, and 6V6 output stage to an ex-Army R107.

Mr. C. A. Simmons, G3SV, Pyrge, Havering-atte-Bower, Essex, requires information on the Canadian Marconi Receiver No. 9, Mk. I, with crystal calibrator.

Mr. C. W. Andrews, G2TP, Haslemere, Pilgrims Way, Dorking, Surrey, requires the diagram and technical notes on the *Hammarlund* Super-Pro type SP110 LX.

Mr. A. Herring, GM3PB, 44 Banner Road, Glasgow, W.3, is in need of a condenser screening box and trimmer tools for the AR88 receiver.

Offers

Mr. B. Hayes, BRS9600, 8 Althorpe Crescent, New Bradwell, Bletchley, Bucks, offers to loan the official manual describing the "Gee" Mark II equipment, which includes such items as the R.A.F. R.F. Units 24, 25 and 26, R1481 Receiver and VCR 97 Viewing Unit. Mr. Hayes also has the manual for the R.A.F. W1117 wavemeter. In return he asks for the loan of the manual for the R1116 Receiver and the R.A.F. Type 6A Viewing Unit.

* * *

A member who recently offered to loan out circuit diagrams points out that their more speedy return would give a better chance to those still on the waiting list.

Electronic Valve Symbols

The *British Standards Institution* has just issued a Standard on "Letter Symbols for Electronic Valves," prepared by the Electrical Industry Committee upon which the R.S.G.B. is represented. The aim is to standardise the letter symbols used by valve manufacturers in their catalogues and in technical literature. An endeavour has been made to ensure that the symbols do not conflict with those used by other branches of electrical engineering and the convenience of production upon a typewriter as well as with normal printers' type has been borne in mind. Electrode symbols and terms used in valve technique are listed and examples given.

The advantages of a general acceptance of the recommendations outlined in this booklet will be obvious to all members.

The reference number of the Standard is B.S. 1409 : 1947 and copies may be obtained—price 2*s*. post free—from The British Standards Institution, 28 Victoria Street, Westminster, London, S.W.1.

Radio Handbooks

As the result of a more favourable arrangement with the publishers, the Society is now in a position to accept orders for the current edition of the *Radio Handbook* at a price of 17/6 post free.

British Sound Recording Association

The wide-spread interest being shown in sound recording is reflected in an announcement from the B.S.R.A. that their membership has now passed the 500 mark and that applications for membership have been received from a number of U.S. enthusiasts.

At a Special General Meeting of the Association held on January 24 with Dr. L. E. C. Hughes, B.Sc. (President), in the Chair, a new Constitution was adopted.

Society members interested in sound recording are invited to communicate with the Hon. Secretary (Mr. R. W. Lowden, "Wayford," Napolean Avenue, Farnborough, Hants).

Record Increase in Television Licences

The number of television licences in force in Great Britain at the end of January, 1948, was 39,000. This represents an increase of 6,300 over the previous month, the largest monthly increase ever recorded.

Achievement

On March 4th last Mr. W. E. ("Bill") Parker, G6BY, of Weston-super-Mare, completed his 1,000th consecutive daily two-way contact with W1DQ. The occasion was marked by an informal luncheon party attended by representatives of the press.

Congratulations are offered to G6BY and W1DQ on a remarkable achievement. Both use an input of 120 watts to a rhombic.

Experimenters' Contact Bureau

Due to illness Mr. D. G. Alexander, BRS4292, has been compelled to resign as Leader of the Receiver Group. The General Secretary will be pleased to hear from any member who is willing to undertake the duties of leader of this important group.

QST and the Radio Amateurs' Handbook

Effective immediately, the subscription rate for *QST* will be increased to 26/– per annum. This increase has been brought about by ever-increasing paper and labour costs.

The A.R.R.L. advise that the first printing of 100,000 copies of the 1948 Handbook was sold out immediately. A second printing is in hand and it is hoped to begin distribution sometime in April. Members who placed orders prior to January 7, 1948, were supplied from the first printing. All orders placed on and after that date will be filled from the second printing.

The A.R.R.L. have again requested that Service addresses shall not be used by those ordering their publications. Such addresses are unreliable and losses may occur.

Neither the A.R.R.L. nor the R.S.G.B. can accept any responsibility for A.R.R.L. publications lost in transit.

Strays

Mr. A. J. Hallett, G3CQ, High Beacon, Havering-atte-Bower, Essex, has recently received a number of QSL cards which he believes may have been intended for a three letter call with similar Morse formation such as CMA, CTK, etc. Any claimants?

* * *

Eric Ilott, VE3BTH, recently advertised for back issues of the BULLETIN. The response was so gratifying that he asks that his thanks be recorded to all who replied to his appeal. Eric, better known to us as G2JK, is now at R.C.E.M.E. School, Barriefield, Ontario.

Heard on the Air

"This is our first *initial* QSO."
"Would you like to hear yourself? I'll put you on."
"Go ahead and call yourself."

Can you beat 'em?

Congrats

● To Region 14 Representative, Mr. D. Macadie, GM6MD, and his wife on the birth of a daughter, now six weeks old.

● Also to Andrew Boa, ex G5HO, whose wife recently presented him with a daughter. Mr. and Mrs. Boa, late of North London, are now living on Ascension Island.

LONDON LECTURE MEETING TO BE HELD ON

FRIDAY, APRIL 9th, 1948

At the INSTITUTION OF ELECTRICAL ENGINEERS, SAVOY PLACE, W.C.2.

Subject :

"RADIO SIGNALS FROM THE SUN"

By M. RYLE, M.A.

(Radio Group Cavendish Laboratory Cambridge.)

Tea from 5.30 p.m. Lecture 6.30 p.m.

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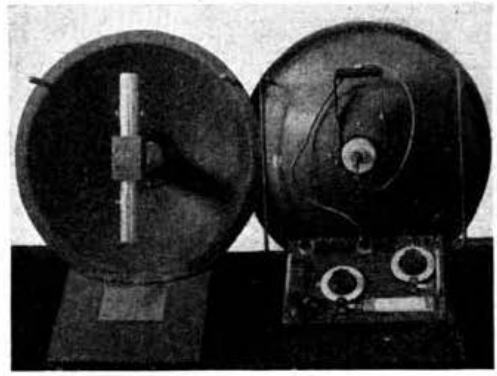

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