R.S.G.B Bulletin

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

Vol. 31 No. 6 DECEMBER, 1955 Price 2/6 Monthly

R.S.G.B. BULLETIN

Devoted to the Science and Advancement of Amateur Radio

Vol. 31, No. 6 **December, 1955**

EDITOR: JOHN CLARRICOATS, O.B.E., J.P., G6CL
ASSISTANT EDITOR: JOHN A. ROUSE, G2AHL
EDITORIAL OFFICE: RADIO SOCIETY OF GREAT BRITAIN
28 LITTLE RUSSELL STREET, LONDON, W.C.1
Telephone: HOLborn 7373

ADVERTISEMENT MANAGER: HORACE FREEMAN
ADVERTISING OFFICE: THE NATIONAL PUBLICITY CO., LTD.,
36-37 UPPER THAMES STREET, LONDON, E.C.4
Telephone: CENtral 0473-6

Published on or about the 15th of each month as its official journal by the Radio Society of Great Britain and issued free to members.

Closing date for copy is the 22nd of the month preceding publication.

CONTENTS

Current Comment

The BULLETIN—*1*

BARELY had last month's comment about the "Turn of the Tide" been written than something occurred which no one could have foreseen.

In his Autumn Budget the Chancellor of the Exchequer substantially increased postage rates, the net result of which is that so far as the Society's finances are concerned, it will be necessary to find no less than an additional £400 a year. All other publications which are distributed by mail will be faced with similar increases in cost. Quite clearly there are only three methods by which these additional expenses can be offset, namely, to bear the cost oneself, to raise the price of the publication to its readers or, to increase advertising rates. All three choices are unpalatable and the first of them seems to be the least unattractive so far as this magazine is concerned.

We said last month that the Society's finances were at the "Turn of the Tide." Having to find that extra £400 a year now means that the rate of turn is slowed up a bit! The point was also made then that every member should do his utmost to enrol *new* members: now, in the light of this latest imposition, the exhortation acquires renewed urgency.

Put in quite blunt terms one might ask: How many new members have *you* brought into the Society during the year now closing and what do you propose to do about getting some more next year?—J. H.

The BULLETIN—*2*

MOVING now from "BULLETIN finances" to "BULLETIN contents," it is always interesting to observe the reaction of readers to the material with which they are presented in these pages month after month. And it is interesting also to note how some of these reactions in effect cancel one another out. For example, a comment consistently heard is: "Why devote all that space to v.h.f. notes?" Almost equally insistent is the plea of the v.h.f. man: "Can't you cut down 'The Month on the Air' feature? It is wasted space so far as we are concerned."

By the same token, antagonists of single sideband, mobile, and television can be balanced by a sufficient number of protagonists who will resist any suggestion that these specialised features should be tampered with in any way. These facts do more than demonstrate the specialist trend of Amateur Radio today; they demonstrate that if everyone had his say, the BULLETIN would be run by a committee of 8,000! This magazine represents the efforts of a committee not of 8,000 but of something like a dozen, meaning the Council's Technical Committee, who give valuable guidance to the editorial staff. Their aim—as they work in close co-operation with one another—is to please most of the members most of the time—and the reasonable reader will assuredly agree that they manage to do so pretty well.—J. H.

"Normal Transmission May Be Resumed"

THE appearance in any urban community of a transmitting amateur is frequently the signal for neighbours to resolve their doubts about unsatisfactory radio or television reception. He is to blame for it all!

A typical case where a radio amateur was the target of neighbours' disfavour came to light earlier this year in Lancashire, where this disfavour was carried to an extreme which ended up by a member, Mr. A. Barlow (G3IOL), being commanded by the local Council to close down his station and to lower his aerial.

Mr. Barlow's case was taken up by the Society as soon as it was notified to Headquarters, but official letters take time to produce a decision. However, matters were speeded up when an R.S.G.B. Council member called to see both Mr. Barlow and representatives of the local Council. No immediate reversal could be expected of a decision which doubtless had not been taken lightly; but the continued close liaison, both personally and officially from Headquarters, eventually produced the desired result. Now G3IOL is on the air once again.

The first and obvious moral hardly needs underlining and will only be mentioned for the sake of completeness: it is that the private transmitting amateur needs to exercise the greatest tact in his relationship with his community if he is not to be the butt of all sorts of oft-unjustified criticism. Secondly, the member who after taking all precautions still runs into trouble, should report the facts *at once* to R.S.G.B. Headquarters.

Clearly, no guarantee can be given that a happy outcome will be automatically provided by the Society as if by a wave of a magic wand; nevertheless, *organized* Amateur Radio carries a great deal of weight (contrary to the beliefs of those who prefer a lone-wolf existence) and a happy result *can* be achieved in many cases.—J. H.

The Countryman's Mobile Transmitter—Receiver

A Compact Unit for 1.8 and 3.5 Mc/s

By F. W. CRABTREE (G3BK)*

WHEN considering the design of the transmitter-receiver described in this article the author's requirements were for a compact station for use when mobile and also for use from a car during weekend and holiday excursions into the country. Previous experience had shown that operating time was, more often than not, limited by the capacity of the car accumulator and emphasis was, therefore, on economy in power requirements especially during " receive " periods.

The Countryman's station consists of three main units —transmitter, speech amplifier-modulator and receiver— and is contained, together with all associated switches, in a 12in. x 8in. x 5½in. cabinet assembly. The h.t. power supplies are separate and consist of a 120 volt battery for the receiver and v.f.o. stage of the transmitter, and a 300 volt 100 mA vibrator pack for the buffer, p.a., speech amplifier and modulator stages. The transmitter has a power input of 10 watts on 'phone or c.w.

The receiver, which is designed for headphone operation, requires only 13 mA at 120 volts for h.t. and 0.45 amps at 12 volts for heaters. The author was somewhat doubtful about using headphones, but a few weeks of operating mobile and from a fixed site has convinced him that the receiver as described, with its low power requirements and hash-free background, is ideal for the purpose for which it is intended.

*28 Regent Avenue, March, Cambs.

R.F. Section

The circuit of the r.f. stages of the transmitter is given in Fig. 1. V1 is a series tuned Colpitts (Clapp) v.f.o. on 1.75 to 2.0 Mc/s; it obtains anode and screen grid voltage via S1a from the 120 volt h.t. battery. V2 acts as a buffer amplifier on 1.8 Mc/s and as a doubler on 3.5 Mc/s. For c.w. operation V2 is keyed in the screen lead. The p.a., a Mullard QV04-7, has a combination of grid leak and cathode bias. The voltage drop across the cathode resistor R8 when excitation is removed holds the power input to the p.a. to a value approximately equal to the normal operating power. Consequently the current drawn from the vibrator pack is more or less constant as the transmitter is keyed. The tank circuit of the QV04-7 is the conventional pi-filter network. No difficulty has been experienced in loading up to an input of 10 watts when using the whip aerials described later in the article.

Speech Amplifier and Modulator

The QV04-7 is anode and screen modulated by a 12AX7 class B zero bias modulator. The modulator stage is driven by a 12AU7 connected as a two-stage audio amplifier. The circuit, shown in Fig. 2, is extremely simple and is a " must " for all low powered transmitters of this type. A carbon microphone inserted in J2 obtains energizing voltage from the cathode current of both halves of the 12AU7 valve. The driver and modulation transformers are from the SCR522 unit and are numbered A103016 and A103018 respectively. The pin connections to these two transformers are given in the circuit diagram.

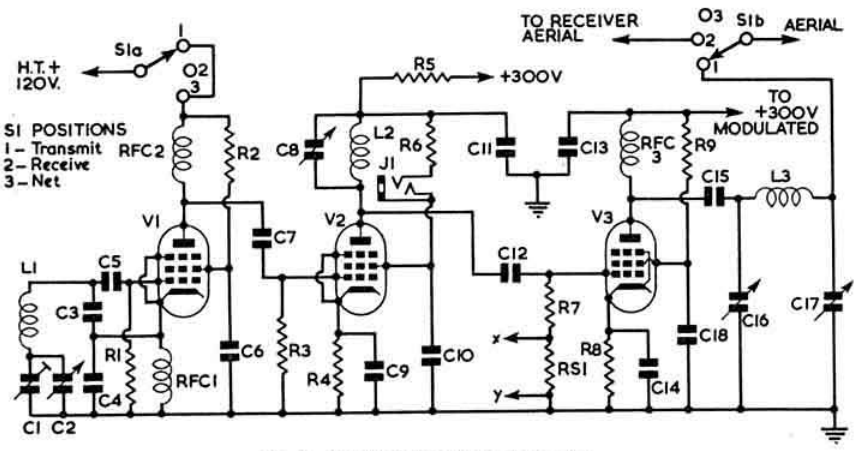


Fig. 1. Circuit of the transmitter section.

C1, 100$\mu\mu$F pre-set.
C2, 35$\mu\mu$F variable.
C3, 300$\mu\mu$F silver mica.
C4, 1000$\mu\mu$F silver mica.
C5, 50$\mu\mu$F silver mica.
C6, 9, 10, 11, 14, 18, 0.01μF Dubilier Minicap.
C7, 12, 100$\mu\mu$F mica.
C8, 150$\mu\mu$F variable.
C13, 1000$\mu\mu$F mica.
C15, 2000$\mu\mu$F mica.
C16, 150$\mu\mu$F variable.
C17, 2 x 0.0005μF midget variable broadcast type (sections in parallel).
L1, medium wave broadcast coil.
L2, 1.8 Mc/s—120 turns 36 s.w.g. d.s.c. close wound, 3.5 Mc/s—64 turns 28 s.w.g. enam. close wound. (Wound on 2 pin former Eddystone Cat. No. 781.)
L3, 1.8 Mc/s—78 turns 24 s.w.g. enam. close wound 3.5 Mc/s—45 turns 20 s.w.g. enam. close wound. (Wound on 1¼ in. dia. former fixed to home constructed 2 pin base.)
RFC1, Eddystone Cat. No. 1010.
RFC2, Eddystone Cat. No. 1066.
RFC3, Eddystone Cat. No. 1022.
R1, 55,000 ohms.
R2, 47,000 ohms.
R3, 100,000 ohms.
R4, 700 ohms.
R5, 6,800 ohms.
R6, 20,000 ohms.
R7, 18,000 ohms.
R8, 300 ohms.
R9, 25,000 ohms.
RS1 5 mA meter shunt (see text).
S1, 3 pole 3 way ceramic wafer switch.
J1, closed circuit jack.
V1, 2 EF91 or equivalent.
V3, QV04-7 Mullard.

Receiver

The receiver presented a great problem. Various t.r.f. combinations were tried and consideration was given to using 1.4 volt filament valves. However, the superhet circuit given in Fig. 3 was finally chosen. Separate controls are used for signal frequency and oscillator tuning thus obviating ganging and tracking difficulties. The frequency changer V1 is followed by two 465 kc/s i.f. stages. A crystal diode is used for the second detector feeding into one triode of a 12AT7 as a.f. amplifier. The second half of the 12AT7 is the b.f.o. The spare 1⅛in. diameter hole seen at the top left in the plan photograph is available for an output stage should one be required. Such an addition is not recommended as the extra power required would

increase the h.t. drain beyond the limits of a dry battery.

Heater Supplies

The heater circuits to the three units are all separately switched to enable maximum power cuts to be made. Fig. 4 gives the heater connections for use with either a 6 volt or a 12 volt accumulator.

Construction

The complete unit is housed in a cabinet assembly supplied by Philpott's Metalworks Ltd., Loughborough. The front panel measures 12in. x 5¼in. and is bolted to a 12in. x 8in. x 2¼in. chassis. Two louvred end panels, seen in place in the plan view photograph, are bolted between the front panel and the top of the chassis. The cabinet is completed by a top and back panel, all in one piece, which is held in place by eight self-threading screws. A base plate is fitted to the bottom of the chassis. This type of cabinet gives ease of construction and servicing.

It is suggested that marks corresponding to the dotted lines shown in Fig. 5 be made on the chassis before construction is commenced and an endeavour made to confine each unit to its own area. The transmitter controls C2, C8, C16 and C17 and the receiver i.f. and audio gain potentiometers R7 and R13 should be equally spaced along the bottom of the front panel. It will be found that the aerial loading condenser C17 will have to poach a little into the receiver area. The receiver main tuning condenser is controlled by a small reduction drive. Both this and the v.f.o. control are directly calibrated. Ivorine scales which have been roughened with fine sandpaper are used. These can be marked with pencil or ink and the markings removed with a damp cloth if necessary. Alternatively white art paper can be fastened with Durofix on to metal scales. Both these condensers should be capable of 360° rotation. One-half of each dial (i.e. 180°) is used for 3.8 to 3.5 Mc/s and the other half for 1.8 to 2.0 Mc/s.

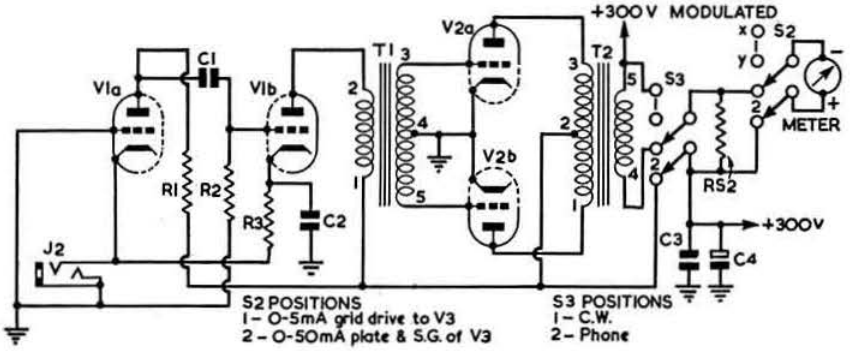


Fig. 2. The speech amplifier and modulator.

C1, 0.003μF mica.
C2, 5μF.
C3, 0.01μF.
C4, 100μF electrolytic.
J2, closed circuit jack.
R1, 56,000 ohms.
R2, 500,000 ohms.
R3, 2,200 ohms.
RS2, 50 mA meter shunt.
S2, S3, d.p.d.t. toggle.
T1, driver transformer.
T2, modulation transformer.
V1, 12AU7.
V2, 12AX7.
Meter, 0–5 mA m.c.

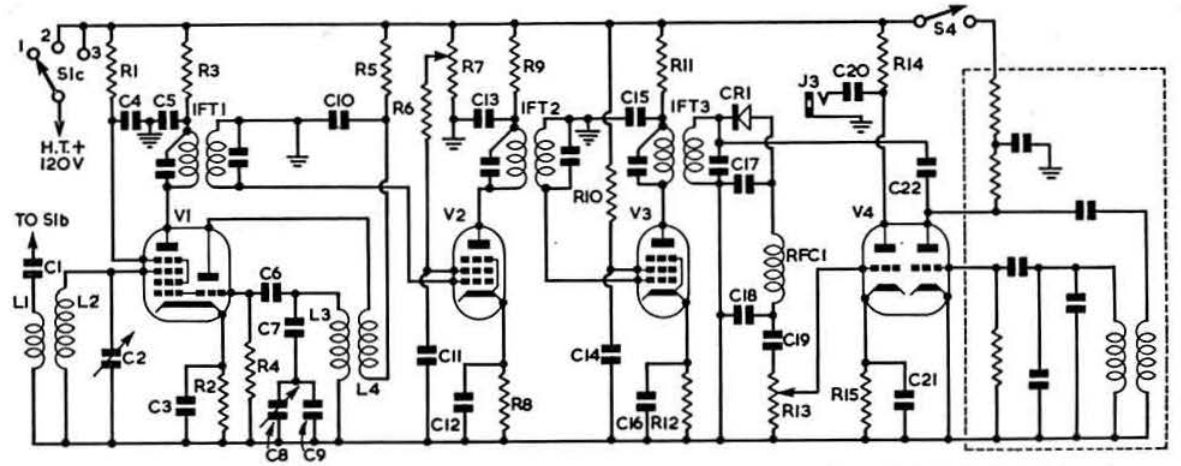


Fig. 3. Circuit diagram of the receiver. The components within the dotted square comprise a Maxi-Q 465 kc/s b.f.o unit.

C1, 100μμF.
C2, 60μμF variable.
C3, 4, 5, 10, 11, 12, 13, 14, 15, 16, 21, 0.01μF Dubilier Minicap.
C6, 100μμF silver mica.
C7, 60μμF silver mica.
C8, 75μμF variable.
C9, 50μμF silver mica.
C17, 10μμF.
C18, 20μμF.
C19, 20. 0.01μF.
C21, 3μF.
C22, wires twisted together.
CR1, GEX34 (G.E.C.).
IFT1, 2, 3, miniature 465 kc/s.
J3, open circuit jack.
L1, 1.8 Mc/s 10 turns, 3.5 Mc/s 6 turns (over earth end of L2).
L2, 1.8 Mc/s 115 turns, 3.5 Mc/s 55 turns.
L3, 1.8 Mc/s 90 turns, 3.5 Mc/s 62 turns.
L4, 1.8 Mc/s 12 turns, 3.5 Mc/s 6 turns (over earth end of L3).
(All coils close wound with 36 s.w.g. d.s.c. wire on 4 pin formers Eddystone Cat. No. 763.)
RFC1, Eddystone Cat. No. 1010.
R1, 25,000 ohms.
R2, 8, 12, 300 ohms.
R3, 9, 11, 1000 ohms.
R4, 50,000 ohms.
R5, 3,000 ohms.
R6, 120,000 ohms.
R7, 50 000 ohms potentiometer.
R10, 82,000 ohms.
R13, ¼ Megohm potentiometer.
R14, 100,000 ohms.
R15, 2,000 ohms.
S4, s.p.s.t. toggle.
V1, 6BE6 or 6K8.
V2, 3, 9003.
V4, 12AT7.

L1 in the v.f.o. circuit, is a Wearite PHF2 medium wave broadcast coil. This coil is wound in sections and it was necessary to remove about a half of one section. The band-set condenser C1 is mounted below chassis near to C2 with access for a trimming tool immediately to the left of the meter. Both sides of C8 must be insulated from chassis. RS1 is the original shunt taken from the 0-5 mA meter. RS2 is made to shunt the meter to read 0-50 mA for anode and screen current to the p.a. The b.f.o. unit is mounted under the chassis between the modulator and r.f. sections with the wire leads coming from the open end near to V4. Screened wire, soldered down to suitably placed solder tags, is used for all the long heater and h.t. connections. The headphone output is on the right-hand end of the chassis and the key and microphone jack sockets are on the transmitter end.

Power connections are all brought to an octal valve base in the middle of the rear of the chassis. The 120 volt h.t. battery is fastened and connected to the vibrator pack. This pack is connected to the transmitter-receiver by means of a four-way cable with octal plugs at each end. It is necessary to have a switch on the power unit to switch off the vibrator during "receive" periods. The earthed side of the input to the vibrator supply must be connected to the earthed pole of the car battery. If a synchronous vibrator is used, the polarity of the output will depend on the input.

Adjustment

There are no d.c. relays, and testing and aligning can, therefore, easily be carried out in the shack with a suitable a.c. power pack. It is suggested that the r.f. stages be dealt with first. With heaters on and 120 volts from a dry battery applied to V1 the v.f.o. should be calibrated by reference to 100 kc/s and 1000 kc/s standards. If C2 does not give sufficient spread, remove a few more turns from L1 and increase the capacity of C1. With h.t. applied to V2, adjustment of C8 should give about 3.5 mA grid drive to the p.a. on both bands. Without load the anode and screen current to the p.a. should dip to about 18 mA at resonance. The standing anode current of the 12AX7 modulator is 16 mA rising to 36 mA on modulation peaks. The 12AU7 draws about 8 mA. There is a slight drop in p.a. anode and screen current on modulation peaks due to the extra current taken by the class B stage causing a voltage drop in the h.t. supply.

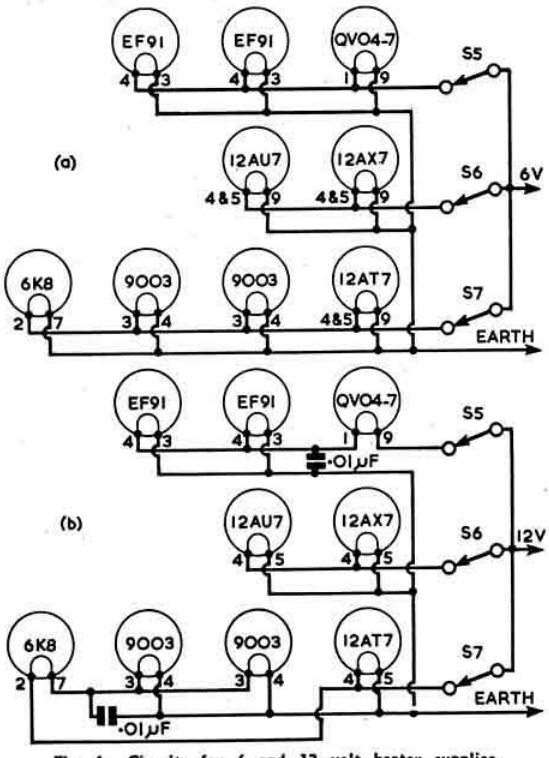


Fig. 4. Circuits for 6 and 12 volt heater supplies.

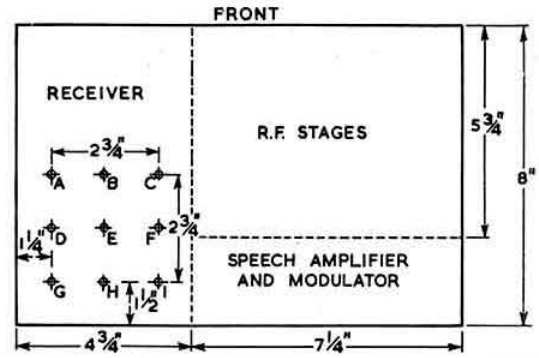


Fig. 5. Plan showing space allotted to each section. The points on the 2¼ in. square in the receiver section indicate positions of A—Aerial coil; B—V1; C—Oscillator coil; D—V2; E—IFT1; F—V4; G—IFT2; H—V3; I—IFT3.

The output from the v.f.o. can be used to assist in the alignment and calibration of the receiver. Coil data for the receiver is for the oscillator to be on the h.f. side of signal frequency on 1.8 Mc/s and on the l.f. side on 3.5 Mc/s. The value of R6 may require some adjustment so that the i.f. gain control R7 brings the i.f. stage near oscillation at the maximum setting of R7.

Whip Aerials

Co-axial cable must be used to connect the transmitter to the car whip. Both 8ft and 12ft Government surplus whips have been used with loading coils in each case between the bottom and second 4ft sections. The loading coil details are as follows:—

1.8 Mc/s band 8ft whip—145 turns of 30 s.w.g. enamelled wire tapped at 6, 12, 18, 24 and 142 turns.

1.8 Mc/s band 12ft whip—94 turns of 30 s.w.g. enamelled wire tapped at 4, 8, 12 and 92 turns.

3.5 Mc/s band 8ft whip—54½ turns of 28 s.w.g. enamelled wire tapped at 3, 6, 9 and 53 turns.

3.5 Mc/s band 12ft whip—38 turns of 28 s.w.g. enamelled wire tapped at 2, 4, 6 and 37 turns.

All coils are close wound on 1¾in. diameter paxolin formers.

The whip aerial must resonate at the operating frequency. With C17 at half capacity on 1.8 Mc/s and near maximum capacity on 3.5 Mc/s and the transmitter tuned to a suitable frequency, it should be possible to find a tapping point on the appropriate loading coil where the anode and screen current to the p.a. show a marked increase. Slight adjustment of the v.f.o. to the point of maximum output will then give the exact resonant frequency for that particular tapping point.

The following notes may be found useful: an 8ft whip is the maximum length which should be used for

mobile work but a 12ft whip is worthwhile when operating from a fixed site. It has been found that the bottom sections of the Government surplus whips will slide over the normal car telescopic whip if the knob at the top of the car whip is first removed. A plastic feeding bottle for a baby makes an excellent protective cover for loading coils!

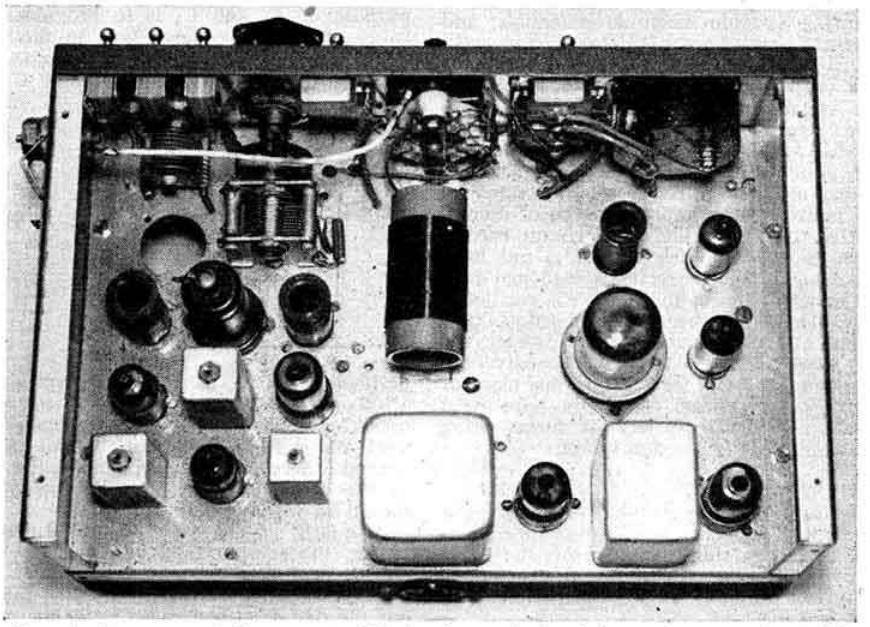
Accessories

A small case containing headphones, key, microphone, spare coils and valves, call-book, log book and the mobile licence completes the station. A stiff backed writing pad with a pencil attached by a length of string is useful.

Results

It was intended to use tree-supported and kite-borne long wires when operating from a fixed site but distances covered with whips have been so encouraging that other aerials have not yet been tried. When operating mobile on Top Band contacts with fixed stations 40 miles away have been 100 per cent. During 1955 N.F.D. contacts with portable stations up to 80 miles were made on Top Band while on 3.5 Mc/s the best contact was with the Port Talbot station (over 200 miles). These N.F.D. contacts were from a fixed site at sea level on the north Norfolk coast; a 12ft whip was in use.

A front view of the Countryman's transmitter-receiver. The main receiver tuning is immediately above the i.f. gain control and the mixer tuning above the audio gain.



Above chassis arrangement of components. The three heater circuit switches may be seen at the top left.

Transistor Oscillators

By A. STEAD, B.Eng. (G2FCO)*

OSCILLATORS, usually sinusoidal, are of considerable importance in radio communication; providing the signal source for transmitters and the local heterodyne signal in superhet receivers. They are also, of course, used in certain units of test equipment. To meet these needs a number of oscillator circuits, based on thermionic valves, have been devised. In recent years, transistor, or crystal triode, oscillators have become recognised as having some advantages over the older types. However, there is much theoretical and experimental work to be done before the new valves supersede the well tried thermionic valves in this most exacting service. It is hoped in this article to describe a few oscillator circuits and to suggest further experimental work.

General Considerations

An electrical oscillation excited in a tuned circuit will in general not be sustained but will decay to zero at a rate dependent on the tuned circuit losses. At low frequencies nearly all of the losses are due to the inevitable resistance of the wire with which the coil is wound. Other losses become important at radio frequencies, but it is usual, for the purpose of estimating the overall tuned circuit losses, to lump these with the coil resistance which then assumes a value which would account for all the losses. In parallel circuits it is usual to convert this loss resistance r to an equivalent parallel resistance R_d called the dynamic resistance. R_d is equal to L/Cr, from which it will be seen that a low loss circuit (i.e., low r) has a high value of R_d. If a parallel tuned circuit could be shunted by a negative resistance numerically equal to R_d, the effective value of R_d would become infinite and the circuit losses zero. Under these conditions an oscillation once started would continue indefinitely. It is possible to produce an incremental negative resistance by using a thermionic or crystal valve having suitable electrode potentials, and a number of negative resistance oscillator circuits have been devised. In the thermionic valve category, the negative r_a of a tetrode with the screen voltage higher than the anode voltage, and the negative mutual conductance between screen current and suppressor voltage of a pentode, are used in the dynatron and transitron oscillators. The point contact crystal triode is also the basis of a number of negative resistance oscillators.

Another, and perhaps more important type of oscillator, uses the valve to amplify the tuned circuit oscillation. A fraction of the amplifier output is fed back into the tuned circuit in the correct phase to make up for the circuit losses. This is the feedback oscillator, and may be regarded as another way of introducing a negative resistance into the tuned circuit. However, the provision of an external feedback path is usually considered to be sufficient reason for treating this class of oscillator separately. Feedback oscillators have been successfully made in a wide variety of forms using thermionic, point contact, and junction valves.

Negative Resistance Oscillators

In order to demonstrate the possibility of obtaining a negative resistance it is necessary to consider the equivalent circuit of a crystal triode. Fig. 1a shows the usual equivalent circuit whilst Fig. 1b shows this arranged for the analysis of common emitter amplifier, with signal source V_g of resistance R_g, and load resistance R_L. The resistances r_e, r_b and r_c are analogous to the r_a and g_m of a thermionic valve, whilst the current gain alpha (α) corresponds to the amplification factor. Solution of Fig. 1b gives the input resistance as viewed at terminals e and b, as

$$R_i = r_e + r_b + \frac{r_e\,(\alpha\, r_c - r_e)}{R_L + r_e + r_c\,(1 - \alpha)}$$

For α greater than unity, as is always the case in the normal working range of the point contact triode, R_i can become negative if R_L is sufficiently small, i.e., when the third term becomes numerically greater than the sum of r_e and r_b. Under these conditions the connection of a tuned circuit between terminals e and b will result in sustained oscillation. The amount of negative resistance is usually controlled by adding an external resistance R_e in series with the emitter terminal. This resistor serves as a feedback control and is adjusted to give good waveform.

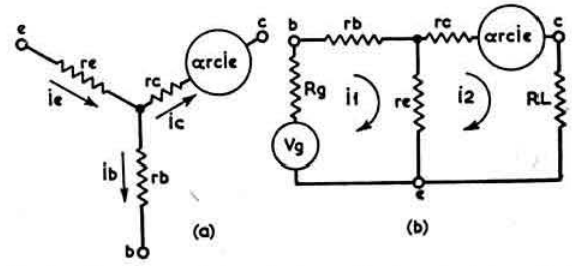


Fig. 1a. Transistor equivalent circuit. Fig. 1b. Equivalent circuit for common emitter amplifier.

Such an oscillator circuit is shown in Fig. 2. The purpose of R_b and C_b is to provide emitter bias, the value of R_b being dependent on the particular triode in use and will usually be between zero and about 300 ohms. The by-pass condenser C_b is not critical,

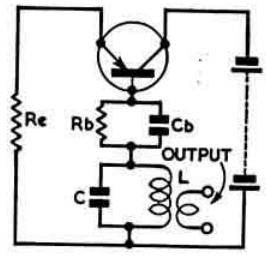


Fig. 2. Point contact triode negative resistance oscillator.

particularly if R_b is small. A typical value of R_e is 4,700 ohms, but it is best adjusted when testing the oscillator. The supply voltage depends on the triode used and will be kept high for an oscillator working near the maximum frequency, i.e., the voltage may be in the range 9 to 30, but the manufacturers' rating should be observed.

A quartz crystal may be substituted for the tuned circuit, the crystal being by-passed for d.c. by a radio frequency choke.

Other negative resistance circuits have been devised, but the one described is generally the most satisfactory. The negative resistance oscillator can be used as a

*77 Brendon Way, Southend-on-Sea, Essex.

harmonic generator, analogous to the well-known tritet circuit. This is simply achieved by including in the collector lead a tuned circuit, resonant at a harmonic of the oscillator frequency. The impedance of this circuit must be low at the oscillator frequency, but this will normally be the case. Fig. 3 shows a crystal controlled harmonic oscillator.

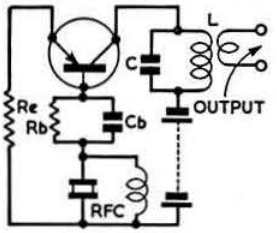


Fig. 3. Harmonic generating oscillator.

Feedback Oscillators

These oscillators, like the corresponding thermionic valve types, depend on positive feedback of energy from output to input. Fig. 4 shows the essentials of a transistor feedback oscillator, the battery being omitted for simplicity. In order that oscillation can be maintained, the voltage V_c/n must be able to supply sufficient emitter current to develop the voltage V_e across the tuned circuit. From the characteristics of the triode

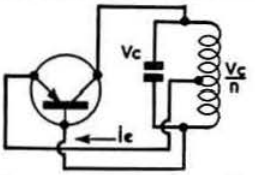


Fig. 4. Basic feedback oscillator.

in use and the dynamic resistance of the tuned circuit, the value of "n" and hence the tapping point can be calculated. It is desirable to make the tapping point higher than the minimum, to allow for the application of different loads and to control the feedback by inserting a resistance in the emitter lead. The practical circuit of such an oscillator is shown in Fig. 5. The reactance of the emitter coupling condenser C_e should only be a few ohms at the working frequency, making C_e=0.01 μF at 2 Mc/s, a typical value. R_e will be less than 1,000 ohms and the tap about a quarter to a third of the way up the coil. The emitter bias resistor R should be not less than 1,000 ohms but should be chosen to give the desired emitter current, being equal to V_e/I_e. Values of V_e and I_e ($=\propto I_c$) will depend upon the purpose for which the oscillator is to be used, being typically 1.5 volts and 500 μA for junction type superhet oscillators, and any values up to the maximum ratings for transmitter oscillators. In cases where a good waveform, i.e., a minimum of harmonics, is desired the value of R_e must be chosen carefully on test. Both of the normal types of transistors may be used in feedback circuits but the junction types are more reliable. Feedback may be applied in other ways such as by means of a separate feedback winding, or a capacity tap replacing the inductance tap. This last method is particularly useful if the required tuning range is not large, as the tapping ratio can easily be adjusted, tuning being by means of a small variable condenser across the main condensers. A sugggested quartz crystal controlled oscillator, which the writer has not tried as yet, would include the crystal in the feedback path, that is in series with R_e. The crystal would oscillate in its series resonant mode.

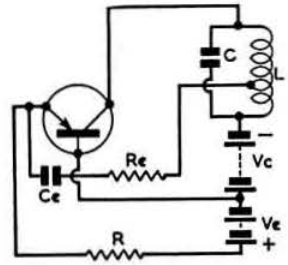
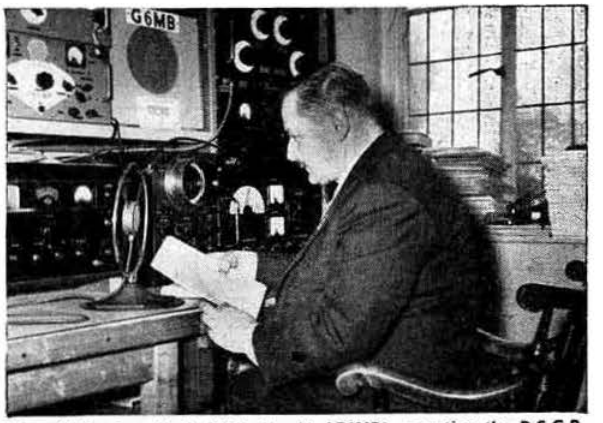


Fig. 5. Practical feedback oscillator.

As the use of transistors is only just beginning in this country it is important to consider the reliability of such devices, and in particular to investigate the frequency stability of oscillators. A study of the mode of operation of both types of transistor shows that there is a delay in the transit of current from the emitter to the collector and this is equivalent to an internal phase shift. It can be shown that such a phase shift will influence the oscillator frequency, in particular to make it different from the resonant frequency of the tuned circuit. This effect is considerable at the frequency known as the $\propto$ cut-off frequency, i.e., the frequency at which the current gain falls to 0.7 of its low frequency value. Furthermore, the cut-off frequency is dependent on the collector voltage which must be from a fairly stable supply. Transmitter oscillators should always be crystal controlled, and where possible operated not too near $\propto$ cut-off.

At the time of writing there are no commercially available junction triodes which will oscillate above about 600 kc/s. However, at least one of the leading valve manufacturers expects to be able, in the near future, to market a type capable of oscillation at 10 Mc/s. Present point contact triodes will oscillate up to 2 Mc/s, but the future of this type of transistor is in some doubt; it is less reliable and more difficult to manufacture than the junction type, and is not really understood theoretically.

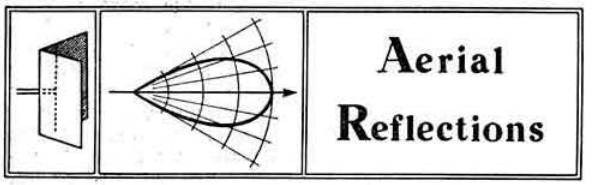
R.S.G.B. News Bulletin Service



Council Member Frank Hicks-Arnold (G6MB) operating the R.S.G.B. Sunday morning news-bulletin service under the call-sign GB2RS.

G9AED Lichfield

BELLING & Lee Ltd. announce that no transmissions from G9AED will take place during the Christmas holiday period. The station will close down at 12.30 p.m. on December 23 and will open at 9.30 a.m. on December 28.



Aerial Reflections

By F. CHARMAN, B.E.M. (G6CJ)*

THIS article is about ways of connecting balanced to unbalanced circuits. A centre-fed dipole is a balanced circuit; a concentric cable is unbalanced; they cannot be joined directly without some trouble or other. You would not tap the inner and outer of a co-ax cable across the two halves of a push-pull tank coil, for the "shack" would be full of r.f. You would use some sort of transformer, so that the cable sheath could be earthed. Yet the same crime is very commonly committed at the aerial end of the line, and the fact that it often goes undetected has only made it more difficult to understand why it is that things sometimes go wrong.

Why Balun?

Balance-to-unbalanced transformers for radio frequencies have gained the general name "baluns," and whilst the pedants may not like this name, it is certainly concise and expressive. These transformers have a wide range of uses, but since they mostly interest amateurs in connection with aerials, it is appropriate to illustrate them in this field.

Fig. 1 indicates why a balun is needed. The middle of a half-wave dipole is connected at L and R to the inner and outer of a concentric line. Now the outside wall of the cable is regarded as impervious to r.f. currents; skin effect produces a terrific barrier to current *through* the wall, and prevents any leakage of transmitter power till it reaches the open end. It is then expected to flow entirely into the two halves of the aerial, but it is obvious from Fig. 1 that some of the current from *inside* the wall can flow over the rim and down along the *outside* wall. It is encouraged to do this because the electric field (dotted) is not symmetrical; side R is at the potential of the sheath, whilst the voltage between L and the sheath is that of the aerial current multiplied by its radiation resistance. There is therefore a stronger field to the sheath from side L. Some of the transmitter power thus flows down the outside of the cable to be lost or radiated in an unauthorized manner. The same effect can happen, in reverse, when receiving.

The outside of the cable is an entirely separate circuit from the inside and the effect of the unbalance depends on its impedance at the aerial end; it may be high, in which case all is well, or it may be low and then all is wrong. Very frequently the effect goes unnoticed, but occasionally the arrangement refuses to work as expected. It is usually impossible to get sensible results from impedance or polar diagram measurements.

A few of the results of unbalance are as follows:—

(a) The "shack" is alive with r.f., and TVI (or BCI) rears its head.

(b) The aerial fires the wrong way.

(c) In receiving, local noise crawls up the outside of the line and back into the receiver.

(d) A t.r.f. television receiver will oscillate, or give an unstable picture especially if both ends of the cable are open.

(e) 3-element arrays, because of low impedance, are particularly sensitive.

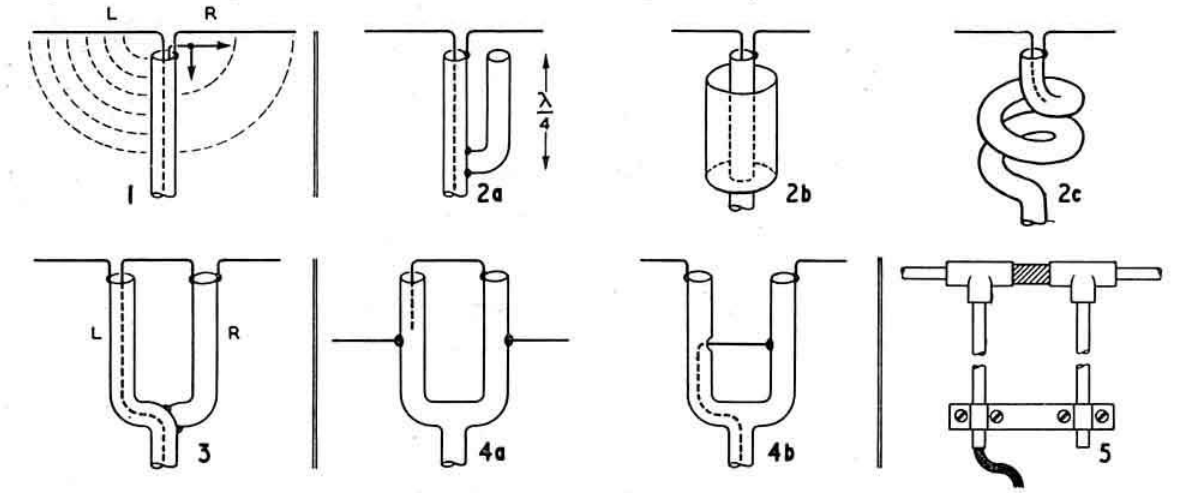


Fig. 1. Unbalanced mismatch. Fig. 2. Rejectors. Fig. 3. The E.M.I. balun. Fig. 4. Transforming balun. Fig. 5. Construction of a v.h.f. balun.

Rejectors

The first way of dealing with the situation is to make sure that the outer wall impedance is always high at the open end. For this purpose the "rejector" was invented (Fig. 2a). A quarter wavelength of cable was connected alongside to offer a high open end impedance at the aerial terminals, and thus forbid the passage of an outside wave. It is a little tricky to adjust. Fig. 2b shows a concentric bucket form due to R.C.A. which has better symmetry, whilst Fig. 2c shows an expedient which can usually be applied with success if the "trouble" has developed—the cable is coiled up into a choke near the aerial. The inside of the cable, of course, knows nothing of these doings. This last trick is often a good cure at the receiver end of a "touchy" TV installation.

*Orchard Cottage, Wexham Street, Stoke Poges, Bucks.

The E.M.I. Balun

The arrangement of Fig. 3 is superior to the plain rejector because firstly it is almost completely symmetrical and secondly because of its greater bandwidth and therefore greater ease of adjustment. The loop is a parallel resonant circuit and is in parallel with the series-resonant aerial. It thus produces a band pass effect on the aerial itself.

The side R is the same diameter as L and is conveniently made from a length of the same cable, but its inner conductor is not connected. The length of the fork is adjusted to be resonant. This can be done easily before joining up the inner conductor, by coupling a grid dip oscillator to the fork. The cable is usually covered with p.v.c., and so the length of the fork is a little less than a free quarter-wave. The working inner is joined across to the "blind" outer and the aerial is then joined to the two outers. It is best to make the characteristic impedance of the fork low, spacing the arms about one diameter.

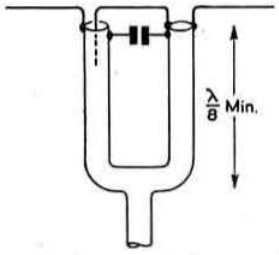


Fig. 6. Short balun.

This is a true balance-unbalance transformer and capable of precision adjustment. The potentials from L and R to earth are equal and opposite all the way, but the full aerial impedance appears across inner and outer of L so that it is a 1:1 transformer. If the aerial impedance is lower than that of the concentric cable the aerial can be tapped down the fork; if the aerial impedance is high, the inner wire can be tapped instead (Figs. 4a and 4b).

Fig. 5 shows a suitable construction for v.h.f. work, made from pipes and fittings with an insulating plug to seal the top connection. The cable passes up inside one tube and its braid outer is bonded to the tube at the top. For lower frequencies, such as 14 Mc/s, the fork is inconveniently long, but it may be shortened by up to 50 per cent. if it is "tuned" with a condenser at the top (Fig. 6). 50 to 100$\mu\mu$F is a suitable value, though for power work a large metallized ceramic capacitor should be used.

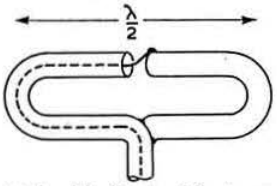


Fig. 7. Combined aerial and balun.

The folded dipole does not take kindly to this transformer, because that type of aerial is itself a parallel resonant circuit, but the clever adaptation in Fig. 7 makes a perfect arrangement. The transformer is built into the aerial which can, if desired, be made entirely from cable. This is an ideal radiator arrangement for a moderately spaced three-or-four-element array, particularly for v.h.f. work.

Band-pass Baluns

Provided the fork is symmetrical, the balancing operation holds for all frequencies, and the bandwidth is only limited by the fact that the parallel reactance of the loop ($Z_o \tan 2\pi l/\lambda$) eventually collapses either side of resonance. It can however be converted into a band-pass filter if a series circuit is added; this can be done by resonating the inductance of the top inner wire connecting lead, with a suitable capacitance (Fig. 8). Those familiar with filters will recognise a half-section constant-k bandpass filter. The series capacitance can be provided by a length of inner conductor in the "blind" arm of the fork. Bandwidths of 2:1 can be obtained.

Many variations of the above principles have appeared, some entirely enclosed for v.h.f. work, many of them quite unnecessarily complex, and bearing wonderful names, such as "bazooka," but space does not permit a full list.

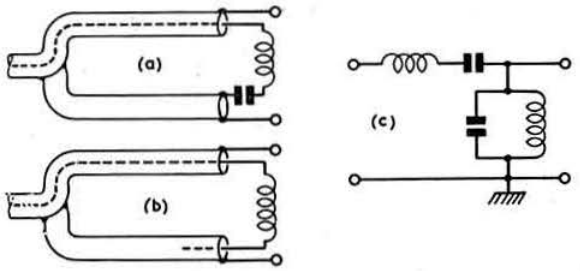


Fig. 8. Band-pass baluns.

Ratio Baluns

Apart from Fig. 4, the above baluns have a 1:1 ratio. Let us take a glance at the grandfather of baluns in Fig. 9. The idea is quite simple—the main line branches into two parts, one of which is a half wave longer than the other, and thereby produces a phase reversal in one half and doubles the output voltage. In order to match to the single line (Z_o) each branch must offer it $2Z_o$ at the junction. In the first instance the branch lines are made from cable of impedance $2Z_o$ so that to match them they each require this value of impedance giving a total for the balanced load of $4Z_o$, and a 4:1 impedance ratio.

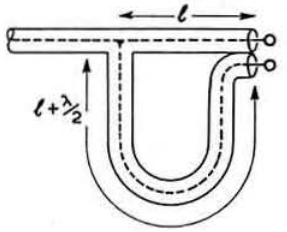


Fig. 9. By-pass transformer.

Next, the quarter-wave transformer effect is called into play, by changing the value of branch impedance Z_{o2} so as to give other ratios. A $\frac{1}{4}$ or $\frac{1}{2}$-wave line loaded by an impedance Z_{o2}/k has an input impedance kZ_{o2}. Thus if the branch line impedances are the same as the single line, ($k=2$) the open end load for each branch will be $\frac{1}{2}Z_o$, i.e. a total $Z_z=Z_o$ and a 1:1 ratio. Other examples are—main line 50 ohms, branches 70 ohms, and load 100 ohms (1:2 ratio), or main line 50 ohms, branches 90 ohms, load 160 ohms (1:3.3 ratio). It should be remembered, when making the branches, that the wave velocity is lower than the free space value, so that the quarter-wave will be the free space value multiplied by the velocity factor of the cable (2/3 for polythene).

(*Continued on p. 277*)

THE MONTH ON THE AIR

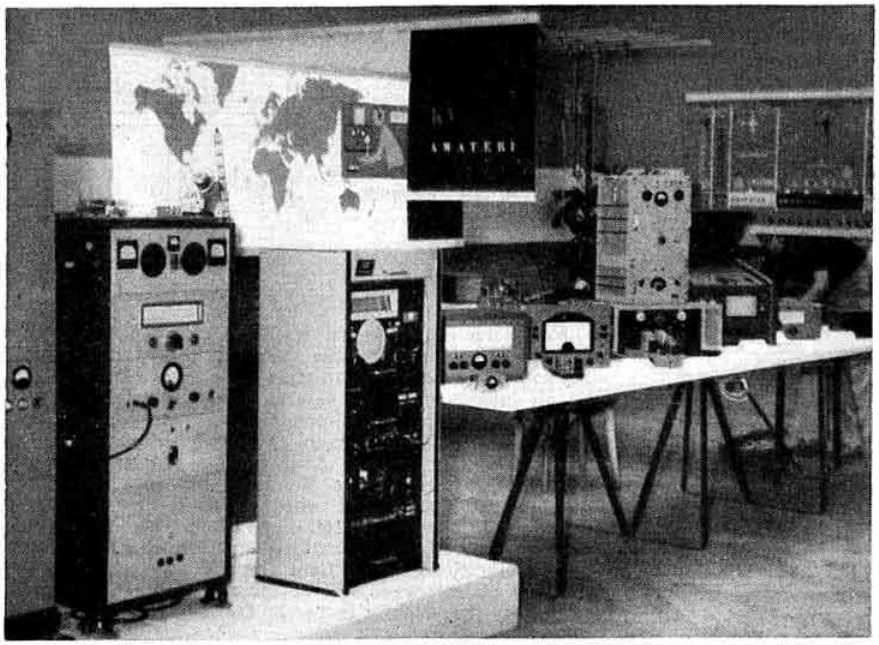
By S. A. HERBERT (G3ATU)*

THE spell of superior conditions which livened up the high frequency bands last month has given way to a somewhat more subdued state of affairs for the time being. However, enough DX remains available to dissuade anyone throwing his rig out of the window or selling his 75A4. Ten metres has been behaving in a gratifying manner during the hours of daylight, which means that most people have to be content with week-end operation. Fifteen is very much the same, although that band does occasionally stay open until after dark. Twenty seems to have suffered something of a recession, with short-skip very evident again, while DX on forty and eighty metres is becoming hard to find. This must be a result of increased activity elsewhere, because the Top Band picture remains bright.

One-sixty Metres

The pattern of DX on Top Band seems to be rather different from that of a year ago. The North Americans are not arriving as often as last year (there's plenty of time for improvement); however, consider what *has* been going on. As we chronicled earlier, ZD3BFC intended trying the band and on November 1 he was heard by **B.R.S.20106** (Petts Wood) and **B.R.S.20317** (Bromley), working GD3UB around 1820 kc/s, for some twenty minutes, starting at 23.20. The next highlight came on November 20 when '20106 heard LU1BL at S4 on 1800 kc/s (06.51). Nothing further was heard of the LU, owing to one of the ever-present commercial carriers, but at 07.35, who should be coming through but ZL1GX—an S4-5 signal on 1810 kc/s. After that, Ws '1BB, '3EIS and '9PNE must seem almost commonplace! **G3ADG** (Halifax) worked VP7NI on 21 Mc/s and passes on the news that '7NI (David Mitchell, ex-GW6AA, ZL1MP) was listening for Gs during the recent Top Band Contest. He didn't hear any, but it's good to know that such a keen DX chaser is on the lookout. He remarks that 1750 to 1850 is fairly clear of Loran, but above 1850 the position is hopeless. VE2LI (ex-G5LI) was a good signal in VP7 and is also looking for Europeans, so far without success. *Late Flash:* Further news from **B.R.S.20106** casts the cold hand of suspicion on LU1BL. Norman understands that key-clicks from this gent were heard strongly on the South Coast! ZD3BFC, too, may not be the Bill Wheeler he should be. Time will tell. As for ZL1GX no doubts have yet been expressed about him and we very much hope he doesn't turn out to be a manifestation of the same pin-witted exponent of the gentle art of "troop-kidding." **G2HDR** (Bristol) is newly licensed and active on Top Band. He held a pre-war Artificial Aerial licence but other affairs have kept him from the air until now. Procedure is a little rusty but is improving apace. '2HDR finds difficulty in working south of Bristol and would welcome reports from that direction.

*Roker House, St. George's Terrace, Roker, Sunderland.



Some of the fine equipment displayed at the recent Yugoslav Radio Amateurs' Exhibition in Zagreb.

Liechtenstein

A new country is due to appear on Top Band when HB9CM takes the air as HB9CM/HE on January 14/15, 1956. He plans to start about 16.00 G.M.T. on January 14 and will operate continuously until the band fades out on January 15. He stresses that between 04.30-07.30 on January 15 he will work DX only and will not answer Europeans, who are urged to keep clear of the frequencies 1800 to 1825 kc/s during that time. HB9CM/HE will work between 1850 and 1890 or crystal controlled on 1915 kc/s and will listen on the entire band, using QMH, QML for replies.

Ten Metre DX

From the lowest to the highest frequency band, where things are happening almost daily. The bulk of the activity is still from North America, with the band opening in that direction around mid-day and fading out at dusk, but there have been one or two mornings when signals have arrived from the Far East and even VK and ZL have been workable for a short period. **G3AAE** (Barnet) heard several VKs on 'phone, as well as most of the rest of the world. His Zepp has seen him past the 100 mark on 21 Mc/s. He is concentrating on 28 Mc/s to collect the few needed there and has just added HZ1HZ, TA3US, KP4, ZE6JT and PJ2AA, all on c.w. **G2FQR** (Walsall) had to be content with CN8MM and Ws. **GM2DBX** (Methilhill) has been in amongst the Ws, KP4s and a TI2 on 'phone but the month's excitement was the arrival of a QSL from KW6BD for a 'phone contact way back in 1952. Twelve cards and a photograph finally produced that one! **B.R.S.19240** (Bristol) found the 'phone band interesting, with W6GPB, W6LTY and W7EHQ putting in strong signals despite a rapid flutter. 4X4GK, VQ2AT, CX, LU and an HA were also logged. **B.R.S.20135** (Newport, I.o.W.) mentions the troublesome QSB, despite which he heard ZS3AB, ZD4BR, VQ2RH, OD5AB, 4X4DK, OA4ED, CX, LU, PY, TI2 and the usual W/VE. **B.R.S.20133** (Melton Mowbray) is up to 34Z-119C on 'phone this year with the help of CT2AG, CX, EA, LU, TA, HZ1HZ, OQ5RU, TG9AD, TI2ES and ZC4RX. **R. J. R. Crocker** (Plymouth) was pleased with the DX available on 'phone and underlines HK3PC, HK5ER, PJ2AF, CE3QJ and, best of all, ZL3JM (09.15), VS6CL and VS6CW (10.15). **B.R.S.20106** pulled YN1KK, KG1IB, CR6BX, ZS3H, UJ8KAA and a UB5 from the under populated c.w. end, then logged 'phones ZS3AB, 3D, CO2BL, CR7AF, TG9, ZD4 and SV0WK. **G3ATU** worked OA4ED, PJ2AA and an LZ (c.w.) and heard OX3RC and FB8RG (Tananarive) on c.w. and ZS9G, CR7AD and CR7AL on 'phone.

Fifteen Metres

Fifteen is providing a wide variety of DX signals during daylight hours. **G3HEV** (Ravensbourne A.R.C.) reports XE1PY, VP7NG, CR9AH, HR1LW, HR3HH, VS2UW, EL4X, VS6CW, CR4AE, FI8AM, VP2DL, 2KM, FM7WD, JZ0KF, HS1VR, VQ6LQ, FY7YC, VK9YT and TG9AD. **G3AAE** worked W6OAZ/MM (off Mexico), VS6DE, JA3AB, KZ5 and CR6 on the key and HR1LW, CR9AH, VU2EJ, CS3AC, TF and HC1 on 'phone. **B.R.S.20317** tried the band for the first time, using a modified R.1155, which pulled in EA6AF, VP9BM, EA9AP, OX1TR, XE1PJ, VQ2 and EL2P on c.w. and CP5EK, EA9AZ, CO2ME, ZS4FP, XE1PY and VP6 on 'phone. **B.R.S.20135** logged ZLs '3LE and '3RB, VKs, Ws, VS6 and KZ5. **B.R.S.20487** (N. Finchley) heard 'phones JA3BB, VP6FR and ZLs '1CE, '1GJ, '1UP, '2BE and ZS5FE. **B.R.S.20106** mentions the path to ZL around 08.00, when numerous 'phone signals often come through. ZL1UP (s.s.b.) is interesting, as is FK8AC, also heard at that time. TG9AZ, FQ8AG, KH6ZA (18.07), ZS9G, W6ZNT/VE8, KL7BFW, VE8SP, VE5DK, W2NWQ/MM (near Hawaii); VP8AQ and VP8BF also come into the DX category, as do YN1KK, VS6CQ, '6DE, KA8AB, JA and KC6CG (07.34) on c.w. **R. J. R. Crocker** finds local noise troublesome still, but his 'phone log features VP8AQ, VQ6U, TG9AD, KH6ZA and KH6AFQ (18.00), VS2BD, XE1PY, VP1SD, VE4RO, '5PW, '6MO, CR4ID, ZD6RM, W6ZNT/VE8, K5BZT/VE8 and KR6QI (08.37). VK9DB has been very active around 11.00, working VK and some Europeans.

Twenty Metres

Conditions during the latter part of November were well down on the level of October although there were some DX openings which were relatively free from European interference. **B.R.S.20416** (London, S.E.12) logged 'phone from TI2AB, YI2AM, ST2DB, ZL, EL10A, KG1FR, W4DGW/OQ, AP2CR and VK4CC (the last two on s.s.b.). **B.R.S.20249** (Sutton) collected

Frequency Predictions for December, 1955

PREPARED BY J. DOUGLAS KAY (G3AAE)

BAND	NORTH AMERICA	CENTRAL AMERICA	SOUTH AMERICA	SOUTH AFRICA	NEAR EAST	MIDDLE EAST	FAR EAST	AUSTRALIA
28 Mc/s	1230—1530	1200—1500	1130—1430	0900—1345	0830—1300	0900—0930	1000—1100	0800
21 Mc/s	1200—1715	1100—1800	0900—1800	0800—1700	0800—1515	0800—1330	0900—1330	0700—1300
14 Mc/s	1030—1900	0900—2000	0800—2000	0800—2000	0730—1800	0800—1600	0830—1500	0900—1430
7 Mc/s	2000—0800	2100—0600	2100—0700	0000—0400	1800—0400	2000—0400	1600—0400	1400—2000
3.5 Mc/s	2200—0800	2200—0700	0200—0600	0400	0000—0500	0300	0300	1700

These predictions are based on information provided by the Engineer-in-Chief of the Post Office. All times are G.M.T.

three new ones with CR6AM, OX3KW and EA6AS. HL7KH, heard calling a UB5 on c.w., would be another new one, but his status seems somewhat doubtful. Malcolm wonders whether the Fuchs and Hillary Expeditions include amateur stations. We imagine not, as both are travelling projects whose job it is to cross the Antarctic continent. However, with many nations sending teams of scientists there for the International Geophysical Year, amateur activity on a considerable scale seems likely. Indeed, an American expedition already en route for the Antarctic has between thirty and forty amateurs on its roster and has been allocated the call block KC4USA-Z. For full details see *QST*, November, 1955.

B.R.S.20788 (Glasgow), the chap next door to the Third Programme transmitter, is adding r.f. stages to his receiver, which will improve things. Meantime TF5SV and an S8 CX2AX keep him happy. **B.R.S.20487** logged 4S7WM, FF8AK, KL7, VE5, ZS and ZL2GN on 'phone, while **B.R.S.20133** got OY2Z, CR6AM, VK, ZL and YS4CB (or could that one be YN4CB?) **B.R.S.20137** heard Antarctic-based LU6ZT, '2ZV, '3ZK and CE7ZJ, VQ6LQ, ZS3E, ZP5HB, VP5BR, VP8BC (Falkland Is.), VP9CB, KG4AV, ZD3A, FY7YE, EL5S/MM and UJ8AG on c.w. and, on 'phone, VP4LO, VE5HL, 5RN, 7JB, FM7WF, KL7AES (19.00), HH3DL and ET3TRC. One of his books gives XV as the call sign for Viet-Nam, which seems to dispose of the Maldives for that prefix. **B.R.S.20106** found things mostly poor and his best on 'phone are VQ6LQ (21.40), ZD4BR, TG9AI, VP4TK, VQ4AQ (06.30, calling VK9RH), VK and ZL. As for c.w., that produced VP2VB (*Yacht Yasme*), KH6IJ (18.55), ZL1HY (19.15), FB8BR, KG4ZV, VE7NJ, 7GI, 7MD, 8TL, ZD6BX and a new ZS7—ZS7H. **B.R.S.19240** found VK4HB, KA2AK and ZL2BE all strong 'phone signals at 08.00. QSLs received recently were from VP2DA, VP2DL and VE8MD. **G2DHV** (Lewisham) has worked VS1GW, VQ4FG and VS5CT and had a QSL from JA7AD. **G3AAE** chatted on c.w. with VP8BL (Falkland Is.) who said he would be there for three years, so there is plenty of time for those interested. **GM2DBX** had a 'phone QSO with F9RY/FC (14180 kc/s). He is at Bastia Airport and should interest those in need of Corsica.

Gough Island Expedition, ZD9AD

G5GK reports that ZD9AD is now in operation and has worked GW3AX and GW3HEU.

Forty Metres

Forty is not the band it was a year ago and **G3AAE** sums up the position thus: "With the h.f. bands wide open . . . perhaps DX operators are losing the fighting instinct so necessary for working the stuff on 7 these days". Some enthusiasts are in there though. **G3HMC** (Yeovil) for example, has concentrated on the band and has worked 36 countries since September. Recent QSOs, made with an input of 48 watts and a 134 ft wire, were with 3A2BH, CT2BO, VP6CJ, SP, LZ and regularly with W, after the broadcasting stations close down around 23.30. '3HMC is "staggered" by the number of YUs on the band. One of them came back to a CQ call and repeated '3HMC's call 27 times (he must have wanted a contact!) Finally, **B.R.S.20106** reports c.w. activity from KG4AN, KL7MOC, VE8ML, VE8NC (03.45 calling CQ GM), VQ4LF (23.00), PJ2AA, VO4C, ZC4FF, LU, PY, YV, W6RZS and W7JWG. *Eighty* c.w. produced VE2LI and KP4TF.

Overseas News

G2PS (Westbury) has news of **VP2VB/P** (Danny Weil) on board the *Yasme*. KV4AA maintains a schedule with the yacht at 13.00, 16.30, 20.00 and 23.00 G.M.T., on or near to 14080 kc/s. '2PS has heard the VP2 (RST348) and has been heard by him at 20.00 but, so far, without actually making a QSO. Ian Cable (B.E.R.S.900) now **MP4BBW** (Bahrain) is active mostly on 21 Mc/s: Saturday to Wednesday, he operates 13.00-14.30, Thursday 09.00-14.30 and Friday 06.00-14.30, with occasional periods on 14 and 28 Mc/s, looking especially for U.K. contacts. **DL2YI** will be no more after December, when operator **GM3ITN** returns to Clydebank after his demob.

Two items are filched with thanks from the pages of the Northern California DX Club's *The DX'er*. YJ1DL (ex-VK4DL, VK2DE, ZC3AB) writes, in part, to W6KEV. "Ham radio is the only vice and hobby I enjoy and the extra key bashing livens me up for my daily battles with QRM on our Government skeds. One drawback is that any stray noises on the air are immediately attributed to poor old YJ1 and not to the primitive town electricity arrangements. The town a.c. has a neutral far above earth and creates large QRN to receivers tuned to h.f. BC stations". YJ1AA has finished a new house and should be active, but he has no a.c. supply and must use battery power. Two recent arrivals from the U.S.A. are interested and will be mostly on 'phone, but Dave's wife reads c.w. and may crank up the YJ1DL rig while the OM is at work. Item two is that a letter to JA1CR from AC5PN states he is Bhutan's first amateur. He intends to replace his B2 transmitter with a higher powered job and feed it into a dipole.

W6YY (La Canada, Cal:) sends what he modestly calls "a few DX tidbits" as follows. He heard ZD9AD (Gough Is.) on 14105 kc/s 'phone and called and raised him on c.w. ZS6ANE says ZD9AD operates on A3 from 16.45, between 14215 and 14220 kc/s. FB8ZZ (New Amsterdam Is.) is usually on 14026 and also 7020 kc/s. QSL direct but don't rush: the first boat arrives next May! W1FH and W9NDA worked AC5PN (14050) in mid-November. ET3TRC was working from the Ethiopian Centennial Fair. VR6AC still operates on 14143 kc/s for two hours on Tuesdays and Saturdays. Jock, ZL2GX, trying to arrange transport to the Kermadec Is. next January, will sail in a N.Z. naval vessel. ZL1PA cannot make the trip, but ZL2CU will go along and they will operate on 14 Mc/s 'phone and c.w. only.

G2MI says that G3SL is active as **GM3SL** on the Isle of Lewis and will be there until next March. QSL via the R.S.G.B.

Novice Stations

A number of readers ask for clarification of the call-signs used by novice stations operating in the U.S.A. and Possessions. The position is that Novices inside the U.S. use the prefix "WN" or "KN", while stations operating in the Overseas Territories drop the initial letter and substitute a W. Thus, a Novice in Puerto Rico (KP4) would sign WP4, KG6 would become WG6 and so on. Novice licensees are restricted to crystal control and a maximum input of 75 watts. A1 only, on 3700-3750, 7150-7200 and 21100-21250 kc/s, plus an allocation on 145 Mc/s.

* * *

As the festive season will be approaching when this issue appears, your commentator takes the opportunity of wishing all readers a Happy Christmas and Prosperous New Year. It seems certain that, at any rate for DX, 1956 will be a happier year than was 1955. Please send the year's last reports as early as possible in view of the usual Christmas postal rush. Good hunting and 73.

TWO METRES AND DOWN

By F. G. LAMBETH (G2AIW)*

DX communication has long been one of the yardsticks by which success in Amateur Radio work is measured. It is not surprising therefore that with the present 2 m world record at well over 1,000 miles, v.h.f. workers are now considering experiments which, it is hoped, will lead to the bridging of the Atlantic. American amateurs are known to be interested while EI2W has already started preparations for another series of tests from sites in Western Ireland. Not everyone who would like to take part will be able to go to Ireland but the Western Highlands of Scotland, the Welsh Mountains and the Pennines should also offer suitable sites.

In view of the great problems involved, the co-operation of every one of those interested in the project will be necessary. Members are therefore invited to submit their views and ideas on the subject immediately, whether or not they believe the Atlantic can be spanned on 2 m or even 70 cm.

Controversial Correspondence

In the past we have asked for controversial v.h.f./u.h.f. matters to be aired in these columns. There has not been very much response; this probably indicates apathy rather than agreement. There must be many questions that need elucidation, and one man's question may call forth another's solution. So please let us have your queries. The whole membership can often gain from the knowledge of a few.

Brussels Meeting

A meeting of Region I V.H.F. Liaison Officers took place in Brussels during the week-end November 19-20 at which delegates from Belgium, France, Germany, Great Britain, Holland, Jugoslavia and Switzerland were present. The President-Elect of the R.S.G.B., Reg. Hammans (G2IG), represented I.A.R.U. Region I Division Committee, and the writer the R.S.G.B. Many subjects of v.h.f./u.h.f. interest were discussed and a full report will appear next month. Thanks are due to all concerned for the arrangements made.

Recommendations were made on many matters of common interest within the framework of the Agenda, a copy of which follows:—

(1) Utilization of frequencies in the 435 and 1,250 Mc/s bands to avoid difficulty in searching for stations.
(2) Proposals for a v.h.f. Relay Contest.
(3) Methods of confirming long distance records.
(4) Bands to be fully covered when tuning.
(5) V.h.f. certificates, including those for listeners.
(6) To consider an offer of a v.h.f. Trophy (Holland) and overtone crystals as prizes.
(7) The reprinting of technical articles which appear in Member Societies' journals.
(8) Definition of the "S" point.
(9) Contest Rules.
(10) Location of stations by latitude and longitude.
(11) Organized listening and transmitting by direction and time.
(12) Recommendation to v.h.f. managers to infuse the v.h.f. spirit into technical students and others of the younger generation.
(13) Transatlantic tests.

The agenda was drawn up when the delegates met on November 19 which explains its somewhat unorthodox make-up.

Two Metre News

During the past month conditions have varied from poor to good. All the well known phases have been experienced except real openings, at any rate in the South, although it has usually been possible to raise some DX up to 200 miles while stations in the west and south-west have at times been very strongly received in the Home Counties. Stations in Yorkshire, Lincolnshire and the Midlands have also been good but the general state of the band is summed up by the old enemy "activity very low." Anyone who finds a dead band has sometimes only himself to thank, as a CQ call will usually bring a reply. Accordingly it is suggested that those who want QSOs should ask for them in the usual way.

G5MR (Hythe, Kent) has found conditions and activity very poor when he has been operating. He is looking forward to the development of the Activity Table for which he hopes to get help from the French stations. **G3KIM** (Southport) sends details of the Southport Radio Society 2 m station which is located at the Sea Cadets' Camp, right on the Sea Front. The p.a. uses push-pull 6C4s running 12 watts input to a 4-element Yagi, 38ft high. The receiver is a modified P40. Power is obtained from 12 volt accumulators as no mains are available. Contacts have been had with several locals (G3GPT, 2NY, 6MI, etc.), while G2ACT and EI9C have been heard. On November 13 a report of 589 was received from GI3GXP (Kilkeel).

G2CZS (Chelmsford) has been building Band III converters but found time to work two new stations in poor conditions on November 13: G3JWQ (Ripley) and '3JZG (Willenhall). **G2AHP** (Perivale) has worked 53 different stations; no DX but some interesting ones including G8SK who was running 4 watts. On November 14, G3HAZ/P (Leighton Buzzard), also with 4 watts input, was 59+. **G8KZ** is about to enter hospital for an operation. All good wishes, Peter, for a prompt and satisfactory recovery.

G8VN (Rugby) found the period around November 13 and later fairly good (with QSB) but he still could not work many stations, although G5KW was raised for the first time. Other new contacts included G2CIW (Cambridge), G5SV (Rugby) and G3FD (Southgate).

G3WW (Wimblington) has only had limited possibilities recently owing to trouble in the T1131 modulator; nevertheless time was found to work Malvern, Bristol, Ripley (Derbys), as well as the London area. The 70 cm beam has been taken down for the winter owing to a broken feeder. **G8LN** (Woolwich) finds his new beam much more satisfactory for DX, but the overall activity is far too low to be healthy. '8LN hopes the new 'phone concession will encourage newcomers to use 2 m. The

*21 Bridge Way, Whitton, Twickenham, Middlesex.

evening of November 18 was very good for the Continent from the south-east side of London, both ON4HN (near Antwerp) and F3LQ (Lille) coming in all the evening, the French station being S8. **G3ANB** (Brightlingsea) is still QRT during TV hours. However, the G8LN/'3ANB sked is still running at 18.30 G.M.T. on Sundays, after which '8LN looks for other QSOs.

B.R.S.6327 (Earlsfield) has been listening most Saturday evenings and Sundays and says that activity has dropped to a very low level in the South. **B.R.S.16075** (Shirley, Southampton) finds a similar state of affairs, but says that the local club may transfer the Sunday Top Band Net to 2 m with the dual advantage of uniformly better local reception, and getting the newcomers to build converters, etc. The meeting was, however, divided 50-50 on this proposal, but we hope it will not be too long deferred! **B.R.S.19162** (Dewsbury), after dismantling and rebuilding his converter, came back on 2 m on November 10, and found "a general air of gloom and depression." On November 13, however, conditions were better and since then there have been some quite good patches but activity seems to be low. A search round 21 and 28 Mc/s on a Sunday shows where some of it has disappeared to!

G3KHA (Bristol 4) is getting measurements for a 6-over-6 beam (if his chimney will stand it). Conditions around Bristol have been fair, with Home Counties' stations coming in well. G8VZ and '2CIW were S9 on 'phone on November 19. No news from Wales, although GW2ACW and '8SU are heard periodically. **G5UM** (Knebworth) reports that five members of the Welwyn Garden City Group are now active in the recently inaugurated Mid-Herts net on 145.8 Mc/s, and half a dozen more, in the process of building equipment, will be on before the end of the year. An outstanding signal is that of G2FMJ of Potters Bar, who is favoured with an exceptionally good site that allows him to put out a S9 signal over most of the London area even though the 4 element aerial is only 15ft above ground in his roof space. G5UM, who usually acts as net control, reports that the regular Monday night activity provided by the Mid-Herts Group has noticeably increased the occupancy of the 2 m band at mid-evening. For instance, at least a dozen stations in the North London area were heard on November 21 throughout television hours. To stimulate interest a compact 2 m portable station (mains operated!) is being loaned by G5UM to various members in turn. By the time these notes appear it should be with the farthest north member of the Group, G3JAP of Hitchin. The net starts at about 19.30 G.M.T. most Mondays after the Top Band net has finished. Later, members search the whole of the band for replies away from their spot frequency of 145.8 M/cs.

G6WU (Winchmore Hill), pending removal to a new house a few hundred yards away, is making do with a flea-power mobile rig in his garage which uses a pair of 6AK5s in push-pull at about 3 watts input. This, with a bisquare aerial on a stick, gives him a potent signal over all of North London. **G6XX** (Howden) was on during the evening of November 16, when G5KW, '2CIW, '3KFD and '2ATK were worked. The top two driven elements of the 12 element stack have been lost but no real difference has been noticed!

G3JGJ (Plympton) says his sked on Sundays at 10.00 G.M.T. with G8DA (Exeter) helps to cheer things up —although only 33 miles distant over Dartmoor heavy QSB often takes the signal to zero. **G3GBO** (in Kenya he is VQ4EV), is now home at Denham, Bucks, but not for good, as was stated in the November BULLETIN. He is on 3 or 4 months' leave and is active on 2 m from his South Bucks location as well as mobile. He later returns for a further 3 years' service with the Kenya Police, where he is in charge of a radio workshop.

G5KW has had over 60 contacts with PE1PL in the last two months; PE1PL's skeds with G5YV, G6LI and G3GPT still appear to be running satisfactorily. **G4DC** (Upminster, Essex) is back on 2 m.

GM6WL (Glasgow) has little to report except news of a good deal of constructional work ready for the next spell of improved conditions. GM6WL regrets having been unexpectedly prevented from giving the promised talk at Edinburgh on 70 cm owing to a sudden call to Orkney and Shetland. **GM3NG** (Carluke) has completed an 829B p.a. modulated by two 807s in p.p. 25 cm activity is going on at GM3GAB and also GM6WL.

GM2FHH (Aberdeen) says "no activity here at all" so he has had time to build a QRO 2 m p.a. and a low power mobile rig for next summer. '2FHH has not even heard an Edinburgh or Glasgow signal for weeks.

Regional V.H.F. Ladder

TWO METRE BAND 1955/6

Psn.	Call & Location	Worked Regions	Worked Countries	Worked Stations
1.	G5YV ..... *Leeds, Yorks.*	15	13	268
2.	G2AIW ..... *Twickenham, Mx.*	15	12	148
3.	G6XX ..... *Howden, Yorks.*	15	10	73
4.	G3CCH ..... *Scunthorpe, Lincs.*	15	6	98
5.	G8IL ..... *Winterslow, Wilts.*	14	10	103
6.	G6TA ..... *Streatham, London*	14	19	146
7.	G8VN ..... *Rugby, Warks.*	10	4	85
8.	G2CZS ..... *Chelmsford, Essex*	10	4	65
9.	G3DO ..... *Sutton Coldfield, Warks.*	10	4	47

Seventy Centimetre Station Reports

The reason there have been no reports lately from **G2RD** (Wallington) is that he had the misfortune to lose his beam in a gale at the end of October. **G8PX** (Oxford) also lost a lazy "H" stack and decided to re-erect it again on a stronger mast, in addition to a light weight job to go above the 2 m beam. After a deal of cogitation, a pair of slots spaced full wave were constructed of $\frac{3}{8}$in. aluminium wire. This was placed on a 1in. dural mast 28ft high. Using the old CV53 tripler. CV53 p.a. rig, a QSO at S9+ each way was had with G6NB. Later in the week (November 11) G3KEQ was worked (S7 in and S8 out) to bring the score to four counties worked on 70 cm.

G3KHA (Bristol 4) has a 70 cm converter working (12AT7 mixer-oscillator) and an 8 element stack but has so far heard no signals. **G2XV** (Cambridge) is having fairly regular contacts with G5YV and '6NB, but G2OI (Manchester), who transmits tests at 23.00-23.30 each night, has not yet been heard. G2XV still feels that a complete list of genuinely active stations should be published. If those members concerned will send particulars of their frequencies they will be published. '2XV has given the following list which is necessarily incomplete: G2DD, '2RD, '2WJ, '2XV, '2DDD, '2FKZ, '3FP, '3WW, '3EOH, '3FUL, '3HBW, '3IOO, '3KEQ, '5DT, '5ML, '5UM, '5YV, '6NB, '6YU, '8SK. Will these stations please let G2AIW have a note of their operating frequencies? Particulars from other genuinely active stations which have been omitted are invited.

G8SK has an improved location at Waltham Abbey, nearly 120ft higher than the old one at Enfield. Many stations are reporting him far stronger on 70 cm than ever before. A tasty morsel for London 70 cm operators is **G6NB** on 434.2 Mc/s. **G5UM,** to his chagrin, cannot hear a peep from Bill when London stations are working him at S9! **G3IOO** (Oswestry) now has a new 32 element stack for 70 cm (via G3WW).

European V.H.F. Contests, 1956

The rules which appear elsewhere have been adopted by several I.A.R.U. Region I Member Societies to govern their v.h.f. contests in 1956. They are being printed so that all those interested will be able to study them at their leisure so that some of the unfortunate happenings of the past may be avoided. R.S.G.B. members wishing to take part in the various contests are, of course, cordially welcome.

* * *

Please send reports for the January issue to arrive by December 19. Best wishes for Christmas and the New Year to all v.h.f. and u.h.f. operators.

Worked and Heard on Two

B.R.S.6327 (Earlsfield) October 17–November 12.
Heard: G2HCG, 3FAN, 3IOO, 3KHA, 5BM, 5YV.

B.R.S.16075 (Shirley, Southampton) October 19–November 19.
Heard: G2BMZ, 2HCG, 2YB, 5YV, 6AG, 6TA, GW2ACW.

B.R.S.19162 (Dewsbury, Yorks) November 10–November 20.
Heard: G2CIW, 2DJM, 2HCG, 2HOP, 2XV, 3BA, 3GGT, 3GHO, 3GJZ, 3IIT, 6AG, 6NB.

G3KHA (Bristol) October 16–November 19.
Worked: G2CIW, 3KEQ, 3WW, 6AG, 6OX, 8AL, 8RW, 8VZ.
Heard: G2ABD, 2AIW, 2BVW, 2DVD, 2FJR, 2HCG, 2UJ, 2WJ, 2XV, 2YB, 3EGG, 3EGV, 3EMG/A, 3FQS, 3GHO, 3GPT, 3GJZ, 3HXS, 3IEV, 3IUL, 3JHM, 3WS, 3VI, 5BC, 5KW, 5LO, 5RD, 6NB, 8KJ, 8PX, 8UQ/P (Wendover).

G3WW (Wimblington) October 21–November 22.
Worked: G2BVW, 2DJM, 2HCG/M (N. of Luton), 3DF, 3DFK, 3ENY, 3FAN, 3FEX, 3FUL, 3GGJ, 3GKZ, 3GNJ, 3GPT, 3IOO, 3JWQ, 3KFT, 5XU, 6ZF, 8AL, 8IL. *Heard:* G2UJ, 2YB, 2FJR, 2FNW, 3DLU, 3KBL.

G8VN (Rugby) October 20–November 20.
Worked: G2BVW, 2CIW, 2FJR, 2HCG, 3CKQ, 3DKF, 3EPW, 3FD, 3GHO, 3GPT, 3HAZ, 3HZF, 3IVF, 3IWJ, 3JWQ, 3JZN, 3KEF/A, 3KHE, 5KW, 5ML, 5SV, 5YV, 6AG, 6OX, 6SN. *Heard:* G2ABD, 2ANS, 2DVD, 2XV, 3AOO, 3BA, 3FMI, 3FUL, 3GKZ, 3IOO, 5JU, 5TZ, 6OZ, 8RW, 8VZ.

G3JGJ (Plympton) October 20–November 20.
Heard: G2ADZ, 2BMZ, 2CVY, 3AUS, 3FIH, 6AG.

Television a Growing Force in Education

THE important part that Television is playing in the field of education is illustrated in a report "Television a World Survey: Supplement 1955" published by H.M.S.O. for UNESCO, price 3s.

In the United States, thirteen educational television stations with a potential audience of 20 million people were already in operation in January, 1955. Plans for 33 more were well advanced and applications for 48 more were pending. Broadcasts include regular courses for high school and college students, home-making courses, and broadcasts on crafts and hobbies. Children in Italy learn English by Television.

Says the report: "In numerous European countries television is now beginning to be taken seriously as a factor in public and commercial life. Even more startling is the advance of television in Canada and the Soviet Union. The former has already passed the million set mark, while the latter is expected to reach it in 1955."

The Supplement contains up-to-date information and statistics about television in 58 countries and non-self-governing territories.

Baluns in Reverse

It is occasionally required to connect from an unbalanced aerial into a balanced line. The above networks can be used, but it is generally rather tricky to make all the currents keep to their correct paths when both ends of the cable are open. Fig. 10 shows a good method. An aerial is connected to one side of a two-wire line. The earthed stub extension acts as a tuned centre tapped transformer, so that the total impedance across the line is four times the aerial-earth impedance. The aerial may be moved along and a second stub added in the usual way if ratios other than 4:1 are needed. The earth may not be necessary but it is preferable. If a real earth is not readily available, an artificial earth can be provided in the form of a quarter wave wire as shown; alternatively, a ground plane of two or more such wires may be used.

Simple connection of the aerial to one side of the line will not work—it is necessary to add the "transformer winding" in the form of the stub to "tell" the line it is balanced. This is one reason why the old Zepp aerial was so uncertain in its behaviour. On the other hand, two aerials, one either side and a half wavelength apart, lazy H style, would not need the addition of a transformer.

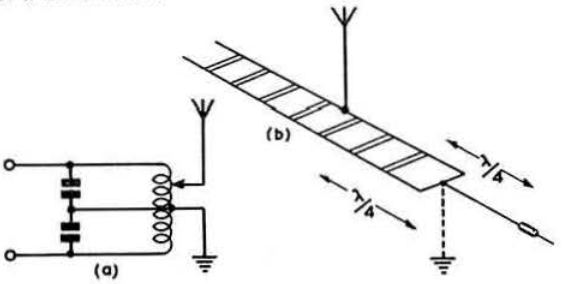


Fig. 10. Unbalanced aerial—balanced line.

References

The literature on this subject is rather scattered, probably because it has not been well understood. The most comprehensive papers seen are in German, and not readily available, namely *Telefunken Zeitung* for December, 1951, and September, 1954. Our standard reference, Terman's *Radio Engineer's Handbook* (First Edition) gives examples and references on page 855; incidentally, the stub matching charts on page 189 (or those in the various Amateur Handbooks) can be used for the operations shown in Figs. 4 and 10. Kraus's valuable book *Antennas* gives a few examples and details, whilst the *Wireless World* has frequently dealt with the subject over many years.

Television Licence Record

THE five millionth television licence was issued during October. In the same month, the number of television licences increased by 194,413 to a total of 5,078,262. The increase was the greatest in any month so far.

The B.B.C. Television Service re-opened after the war on June 7, 1946. By the end of the following year there were 32,994 licences in force. In December, 1950, the total was 586,601, and more than double that figure in 1951 (1,181,126). At the end of last year the number had risen to 4,155,989.

Radio Amateur Emergency Network

By C. L. FENTON (G3ABB)*

DURING the past weeks many hours have been given to the checking of the Rally logs. Whilst the final results are not yet known, although these should be available by the time this column appears in print, a number of points stand out above all others. One which caused considerable surprise was the number of entrants who did not fully understand the rules, and who repeated the same test phrase to all and sundry. Another point is the number of entrants who logged in B.S.T., although the rules said G.M.T. The majority of the logs were extremely neat, but there were, unfortunately, a few which were very badly written.

Turning to the listeners' logs, the majority only recorded the call-sign of the station they heard, omitting the call-sign of the station who was being called (or answered). This not only made checking difficult, but is in itself bad log keeping. A good log should give the fullest possible information, and omission of any of the call-signs of the stations engaged in the contact nullifies any other information.

Grateful thanks are due to those who so kindly submitted check logs, and every credit must be given to the contestants for their valiant efforts, particularly to the blind member who put in such an excellent log.

Final placings will be published in the BULLETIN as soon as possible.

Notes and News

It is with regret that we announce the resignation of three E.C.O.s this month, two owing to pressure of business and one due to removal. New E.C.O.s for the areas concerned are urgently required. Volunteers are requested to contact the writer as soon as possible.

With the approach of winter, it is hoped that the majority of members will now have mobile, portable or transportable equipment ready for service. We all hope there will be no necessity to use it, but, if the call does come, let us be prepared and not be caught out in an emergency. Remember your calling frequencies, and monitor them as much as possible.

The lifeboat sets have not been forgotten; further supplies are awaited from the shipping companies.

News from the Groups

Hull was recently alerted by "red" flood warnings, and the Group stood by in readiness. Fortunately they were able to stand down without any call on their services. **Bath** gave active support to G3GMN/P during the recent Rally, mainly on 3.5 Mc/s, but also on other bands. **Lichfield.** The County Controller recently spoke to the Coventry R.S.G.B. Group on the subject of R.A.E.N., and also to Tops Club members at the Lichfield "Topsfest."

Wirral, Cheshire. More mobiles are becoming available in this area. **Yorkshire.** Lt.-Col. Dunn (Chairman of the R.A.E.N. Committee) has lectured on R.A.E.N. at Filey and Bridlington. The first two "amber" warnings of the winter were received recently and "bad weather" watches undertaken.

Resignations

The following E.C.O.s have resigned: G. B. Woffinden, Egremont, Cumberland; C. T. Biggs, Winterbourne Abbas, Dorchester; Dr. S. T. Crowther, Bristol.

Personal

After two years as Honorary Secretary to the R.A.E.N. Committee—two years which have given great pleasure, and which have been of the utmost interest—the writer feels that he cannot continue in this office for a further year as the duties have taken up all available spare time. He takes this opportunity of thanking all members for their support and encouragement, and asks that the same support be given to his successor.

MORE THAN 300 MOBILE LICENCES HAVE BEEN ISSUED. DO YOU HOLD ONE ?

As this column will appear just before Christmas, the writer, on behalf of the R.A.E.N. Committee, takes this opportunity of wishing all members a Happy Christmas and a successful New Year. It was a pleasure to meet those members of R.A.E.N. who were able to attend the Amateur Radio Exhibition.

In conclusion, a further appeal must be made for more members, particularly in Wales and Scotland; more volunteers as E.C.O.s; and more regular reports from E.C.Os.

Reports for inclusion in the next R.A.E.N. feature, which will appear in the February, 1956, issue of the BULLETIN, should be sent to the General Secretary, R.S.G.B., not later than January 20, 1956.

"Niarbyl," Gay Bowers, Danbury, Chelmsford, Essex ('phone Danbury 518).

The Ninth Annual R.S.G.B. Amateur Radio Exhibition

IN the presence of a large gathering of members and many distinguished visitors the Ninth Annual R.S.G.B. Amateur Radio Exhibition was opened at 12 noon on Wednesday, November 23, 1955, by Vice-Admiral J. W. S. Dorling, C.B., M.I.E.E. (Director of the Radio Industry Council). In his speech Vice-Admiral Dorling mentioned his early association with wireless—an association which began many years before World War I. His first transmitter used a spark coil and his first receiver a coherer. He recalled the thrill of hearing Poldhu and Eiffel Tower. Vice-Admiral Dorling congratulated the Society on providing an annual opportunity for members to examine the latest developments in components and valves and spoke of the tremendous progress made by amateurs in recent years.

He suggested there are many more fields to conquer and emphasized that the amateur can be relied upon to contribute the same enthusiasm, energy and ingenuity which made him such an important asset to the security of the country in the years between the wars. Vice-Admiral Dorling referred to the valuable contribution made by Mr. Hugh Pocock, Mr. John Clarricoats and others in the formation, 20 years ago, of the Royal Naval Wireless Auxiliary Reserve—the first Reserve of wireless amateurs in the United Kingdom.

Vice-Admiral Dorling then spoke of the splendid opportunities open to young amateurs to join the radio and electronics industry. He referred to the Society's contribution to the last two Radio Shows at Earls Court. "The general public," said Vice-Admiral Dorling, "were greatly impressed by the high quality of the exhibits, whilst the good 'salesmanship' of those in attendance was most marked." Congratulations were offered to the Society and the Museum authorities for their enterprise in inaugurating an Amateur Radio station at the Science Museum. "This effort should certainly help many young people to decide on radio and electronics as a worthwhile and satisfying career of almost unlimited possibilities."

Vice-Admiral J. W. S. Dorling, C.B. (Director of the Radio Industry Council) speaking at the opening of the Exhibition.
(Photo by Tella Co. Ltd.)

Mr. Arthur Milne (G2MI), Immediate Past President, in proposing a vote of thanks to Vice-Admiral Dorling, referred to his enthusiastic support of the Amateur Radio movement and of the great help he had given to the Society in connection with the last two National Radio Shows.

Luncheon

Following the opening ceremony the President and Council entertained about 50 guests at a luncheon in the Fountain Room of the Royal Hotel. Among them were Sir Noel Ashbridge, Technical Director, Marconi Co., Ltd., Sir Harold Bishop, Director of Technical Services, B.B.C., Rear-Admiral Sir Philip Clarke, President, British Institution of Radio Engineers, Dr. R. L. Smith-Rose, Director of Radio Research, D.S.I.R., Mr. T. E. Goldup, Technical Director, Mullard, Ltd., Air Commodore Nicholas and Wing Commander W. E. Dunn (representing the Air Ministry), Mr. A. H. Mumford and Captain C. F. Booth (representing the Post Office), Mr. H. Stanesby (Chairman, Radio and Communications Section, I.E.E.), Mr. C. Ian Orr-Ewing, M.P. (Director of Cossor, Ltd.), Capt. H. de A. Donisthorpe (representing the General Electric Co., Ltd.), Mr. Rupert Browne (Secretary, Radio Industry Council), Mr. Andrew Reid and Miss Joan Cutting (Press Officers, R.I.C.), Mr. Harry Faulkner (Director, T.E.M.A.), Mr. Hugh Pocock (Director, Iliffe & Sons, Ltd.), and Mr. G. R. M. Garratt (Science Museum). Others present included Past Presidents Gerald Marcuse, Alfred Gay, Ernest Gardiner and Victor Desmond, and Vice-Presidents J. W. Mathews and D. N. Corfield.

The President (Mr. H. A. Bartlett, G5QA), in a happy mood at the reception with Lt.-Col. A. C. Dunn, G2ACD (Chairman, R.A.E.N. Committee) and Mr. L. E. Newnham, G6NZ (Member of Council).

A toast to the Society was proposed by Sir Noel Ashbridge who referred to the early days of the Society and to the presence at the luncheon of Dr. Smith-Rose, who was a member before the first World War. Sir Noel also spoke of the part which the Society had played, and is playing, in International Amateur Radio affairs. He spoke from personal experience of the extremely effective contribution made by Messrs. Lewer and Clarricoats to the Atlantic City Conference in 1947, and to

the manner in which the European Radio Societies then looked, and now look, to the R.S.G.B. for leadership. He believed that the Council was very wise to prepare for further International Radio conferences because "the R.S.G.B. contribution to such conferences is always very considerable." Sir Noel, who for many years was Chief Engineer of the B.B.C. and latterly Head of B.B.C. Technical Services, congratulated the Society on its enterprise in encouraging new techniques and arts such as single sideband, frequency modulation, Amateur Television and v.h.f.-u.h.f. transmissions. Sir Noel stated that he was happy to learn from the Secretary of the cordial relations that exist between the Society and the Post Office.

During the Luncheon which followed the opening of the Exhibition the President replied to a toast to the Society proposed by Sir Noel Ashbridge. In the picture from left to right, Sir Harold Bishop, C.B.E., Mr. T. E. Goldup, C.B.E., Vice-Admiral J. W. S. Dorling, C.B. and Mr. H. A. Bartlett.

The President in his reply spoke of the co-operation the Society had received from the G.P.O. since the war and of the many concessions that had been granted. He referred in particular to the News Bulletin Service and to the recent decision by the P.M.G. to remove the 12 months' c.w. only restriction on new licensees. Mr. Bartlett expressed the hope that the G.P.O. would refrain from granting the call G3ITA to Sir Harold Bishop! (Sir Harold is Head of B.B.C. Technical Services.—ED.). The President also spoke of the value of the new Mobile Licence and the inducement it has given to

Headquarters' Station, GB3RS/A, was in operation throughout the period of the Exhibition. The main transmitter, seen at the back of the picture, was loaned by Clem Jardine (G5DJ), and the receiver and the Top Band transmitter by Eric Yeomanson (G3IIR).

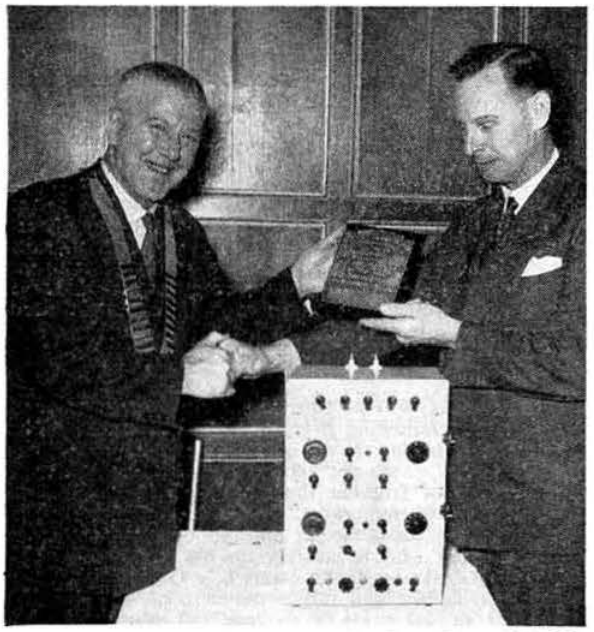
members to construct gear which can be used in an emergency. He suggested that the Society must always be in a position to talk with the full weight of the Amateur Radio movement behind it.

Mr. Bartlett, after congratulating the Air Ministry on a first-class exhibit, concluded his speech with a reference to the splendid efforts of Mr. Phil Thorogood (G4KD) who, in addition to organizing the Exhibition, had presented a silver plaque for award to the member submitting for display the most meritorious piece of home-constructed equipment.

A toast to the Radio Industry was proposed by the President-Elect (Mr. R. H. Hammans, G2IG). Mr. Hammans remarked that without the wholehearted support of the industry amateurs would not be able to carry on with their hobby. He also referred to the assistance given to the Society by those firms who take space in the R.S.G.B. BULLETIN. "The relationship between the R.S.G.B. and the Radio Industry Council," he said, "has always been excellent." Bearing in mind the contribution made by amateurs during the 1939-45 war, Mr. Hammans considered it was unfortunate that the Admiralty and War Office had not supported the Exhibition. The absence of a Post Office exhibit was also regretted.

Mr. R. H. Hammans, G2IG (President-Elect), Mr. W. A. Scarr, G2WS (Past President and Council Member), Vice-Admiral J. W. S. Dorling, C.B., Sir Noel Ashbridge, Mr. D. A. Findlay, G3BZG (Honorary Treasurer) with the President (Mr. H. A. Bartlett, G5QA) at the Reception which followed the opening of the Exhibition. *(Photo by Tella Co. Ltd.)*

In his reply, Mr. T. E. Goldup (Technical Director, Mullard, Ltd.) spoke of the unique connection between the Radio Industry and the radio amateur. He referred to the early days of radio when the industry was largely dependent upon the amateur movement for providing skilled personnel and commented that at the present time no less than 25 members of his own organization held licences. He suggested that the future of the Radio Industry is in the expanding field of electronics, in which there is a growing demand for men with skill and knowledge of radio problems. He believed that the R.S.G.B. could do great service by encouraging young members to join the industry. He gave an assurance that the industry as a whole would continue to co-operate with the Society.



Shortly after the Exhibition was opened, Mr. David Deacon (G3BCM) received the Thorogood Silver Plaque from the President. The winning piece of gear—a miniature Amateur Radio station—can be seen on the table.

The General Secretary (Mr. John Clarricoats), in the course of a speech of welcome to the Society's guests, spoke of the cordial relationships which exist between the Society and the Post Office, the Air Ministry, the I.E.E., the Brit.I.R.E., the Radio Industry and the Radio Press. He hoped that more of the larger concerns would support the Exhibition next year.

Replying for the Guests, Sir Harold Bishop congratulated the Society on its enterprise in arranging the Exhibition. He supported the view put forward by Mr. Goldup that not nearly enough young men are coming forward to take their place in the radio industry. He remarked that last year out of every 100 undergraduates from grammar schools who sat for a degree, 43 per cent succeeded in Arts and only 33 per cent in Science. He felt that the emphasis should be shifted from Arts to Science in view of the country's pressing need for more trained technicians. He believed that great efforts should be made to make technical education more attractive for young men. He recognized that one of the greatest problems at present was that of lack of qualified teaching staff.

Sir Harold spoke of the good relations that existed between the Society and the B.B.C. He concluded by saying that neither the B.B.C. nor the Radio Industry look down on amateurs.

Following the Luncheon the President presented the Thorogood Plaque to Mr. David Deacon (G3BCM) whose miniature station was judged to be the most meritorious piece of home constructed equipment on display.

The President then accompanied the distinguished guests on a tour of the Exhibition.

A detailed review of the Exhibition will appear in the January issue of the BULLETIN.

* * *

Unless otherwise stated all photographs are by Eric Yeomanson (G3IIR).

Single Sideband Conventionette

THE Third Annual Conventionette of the R.S.G.B. S.S.B. Group was held on the last day of the R.S.G.B. Amateur Radio Exhibition, 1955. The President-elect, Mr. Reg. Hammans (G2IG)—a single sideband enthusiast himself—took the chair.

Among the 38 members present were DL4LZ, DL6WL, PA0KC and GI3ZX, all of whom had made the journey to London to take part in the discussions which covered a wide range of subjects of interest to the s.s.b. operator, including licensing, operating techniques, Top Band and v.h.f. operation, and various technical matters.

Dorset County Hamfest, 1955

HERB. Bartlett (G5QA), President of the R.S.G.B., was the guest of honour at the Dorset County Hamfest held at the Port Mahon Hotel, Poole, on November 13. Other guests included Bob Lane (G2BYA) and representatives from neighbouring counties. In all an attendance of 60 members and friends was recorded. After lunch one party visited Poole Generating Station while those who remained at the hotel were entertained with a programme of films. During the early evening there was a draw in which all attending received a prize. The organizers thank the manufacturers concerned for their generosity in donating the prizes and all those who came long distances for helping to make the meeting a success.

Gloucester County Dinner

THE Gloucester County R.S.G.B. Dinner will be held at the Midland and Royal Hotel, Station Road, Gloucester, on February 4, 1956, commencing at 7.30 p.m. Tickets are available, price 10/6, from the T.R.s for Gloucester, Cheltenham and Stroud, and from the C.R.-designate, E. A. Perkins (G3MA), 40 Calton Road, Gloucester.

North West Manchester Annual Get-together

MEMBERS are asked to note that the date of the Fourth Annual Get-together of North West Manchester Radio Amateurs has been changed to December 23 and the venue to the Stocks Hotel, Walkden.

Electrical Engineers' Exhibition Film

MORE than a 100 representatives of technical and trade journals attended the premiere in London on November 15 of the sound film of the Fourth Electrical Engineers' Exhibition held at Earls Court earlier in the year.

There will be 60 new exhibitors, making a total of 300, at the 1956 Exhibition which opens at Earls Court on March 20. The General Manager of the Exhibition is Mr. Phil Thorogood (G4KD).

Tests and Contests

Second Two Metre Field Day, 1955

THE Second Two Metre Field Day, held on August 7, was noteworthy for the completion of an outstanding "1955 double" by L. J. Kennard (G3ABA) of Coventry, who also headed the list in the May event; for the excellent weather (the first time a two metre field day has struck lucky since May, 1954); for the strong dislike expressed by many contestants at being asked to exchange National Grid References; and—a good augury—the extremely high level of activity. Altogether, some 60 stations—portable or mobile—were out-of-doors in G, GI, GM and GW; whilst over 170 fixed stations were giving them points from G, GC, GD, GM, GW, EI and F.

Conditions were reasonably good—contacts exceeding 150 miles were made during each hour of the contest from 10.00-19.00 G.M.T.—though for most stations the early evening proved the peak period. The longest hauls were those between G3GWB/P and GI2FHN/P, and GM3EGW/P and EI2W, both exceeding the 240 mile mark. But it is also encouraging to note that results all round show steady improvement; for example, 23 entrants bettered the 150 mile span compared with 17 in the first 1955 field day, and 19 in the second 1954 event. The trend towards the almost exclusive use of telephony in two metre contests is most evident; of the 97 contacts made by G3ABA/P all but 3 were apparently on 'phone; at G3GWB/P, his closest rival, the proportion was only slightly higher, c.w. being used at one or the other end in 8 out of 93 contacts.

Portable Equipment

The equipment at G3ABA would seem to be substantially the same as that in use in the May event (832 p.a., 24 element stack, 6J6 r.f. and 6J6 mixer in crystal-controlled converter into Eddystone 640). At G3GWB/P—the Northampton Short Wave Club station—the transmitter was EF50 Squier oscillator, 5763 tripler, 5763 doubler, 832 p.a. modulated by a pair of 1622s with two stacked skeleton slots and a six over six slot beam, phased and used together or separately as required. The receiver was a crystal controlled converter, with neutralized 6AK5 r.f. into two Eddystone 640 receivers, tuning 24-26 Mc/s. G4JJ/P also had an 832 p.a. (input 10 watts) with two skeleton slots. The receiver in this case was push-pull r.f., mixer and oscillator with tunable BC455 unit. The line up at G8UQ/P was 6AQ5-12AU7-5763-832A, input 15 watts, modulated by a pair of 6V6s driven by two 12AT7 speech amplifiers and a double conversion superhet with a three stage EC91 grounded-grid r.f. section, and 10 element stack.

The height above sea level was indicated by only a few entrants but these included GW3BOC/P 1620ft; GM3EGW/P 1370ft; GW3GWA/P 1296ft; G3FKO/P 1198ft. Incidentally, the winner, G3ABA/P, was at a more modest level (620ft) though both '3ABA and '3GWB are believed to have had their formidable arrays up to heights exceeding 50ft above ground: stations with less ambitious ideas as to masts can take heart from the third station, '4JJ/P, whose two skeleton slots were only 16ft high but brought him 49 useful contacts.

One entrant mentions interference caused by unstable transmitters, whilst another draws attention to the need to prevent over-modulation.

Results of Second Two Metre Field Day

Psn.	Call-sign	Location	Best QSO (miles)	Points
1	G3ABA/P	6 m. n.w. Coventry	222	9468
2	G3GWB/P	Honey Hill, nr. Cold Ashby	242	9292
3	G4JJ/P	8 m. e. Buxton	182	6209
4	G8UQ/P	7 m. s.e. Basingstoke	190	5008
5	G3YZ/P	Bubbs Hill, Cheltenham	163	4992
6	G3AGS/P	5 m. n.w. Bolton	184	4843
7	GW3GWA/P	Vroncysyute Hill, Wrexham	159	4487
8	G8QY/P	5 m. s. Birmingham	205	4430
9	G5KW/P	Well Hill, Kent	190	4313
10	GW3BOC/P	10 m. s.w. Denbigh	216	3776
11	G3GOP/P	3 m. e. Corfe	237	3602
12	G3AYT/P	N.G.R. 33/911594	168	3595
13	G3AZT/P	10 m. s. Rugby	122	3462
14	G2VB/P	1 m. s.e. Woldingham	182	3378
15	G5OB/P	9 m. n.e. Southampton	205	3353
16	G3FKO/P	Quantocks, Som.	195	3309
17	G3ION/P	4 m. s.e. Shaftesbury	158	3156
18	G3XC/P	1 m. n.e. Watlington	102	3104
19	G2HIF/P	5 m. w.n.w. Blandford	200	3074
20	G3DVQ/P	3 m. e. Guildford	104	2793
*	G3BJQ/P	Burton Hills, Worcs.	112	2680
21	G3DVK/P	4 m. n.e. Leek	175	2615
22	G3FD/P	Danbury Church, Essex	146	2441
23	GM3EGW/P	East Lomond, Fifeshire	242	2415
24	G6MN/P	8 m. s.w. Sheffield	192	2238
25	G8PX/P	4 m. n.e. Oxford	156	2237
26	G3FRG/P	3 m. s.w. Storrington	92	2013
27	G3GCX/P	1 m. s.w. Askam Bryan	168	1849
28	G2FCL/P	nr. Tong, Bradford	155	1644
29	G3DO/P	3 m. s.e. Stafford	65	1307
30	G3ELG/P	Man Tor, nr. Castleton	74	1064
31	G4IB/P	4 m. n. Seaford	140	968

* *Late entry*

Comments

The new N.G.R. rule formed the main topic of comment, as the following brief extracts will show; "The Contest Committee have made a mistake over the N.G.R. rule . . . we are getting more stations entering now so do not frighten them off."—G4JJ. "Why, oh why, these grid references?"—G8UQ. "The N.G.R. rule . . . involves quite an amount of extra work for the poor chap who is entirely on his own."—G3FGY. "Is the N.G.R. *really* necessary?"—GM3EGW. "My radio is a hobby and not a maths contest."—G6MN. "N.G.R.s caused a lot of trouble and suggest the exchange of numbers is discontinued in the next contest."—G3DO. "Suggest a power limit of 5 watts."—G3AZT. "Not enough operators listen for c.w. . . . weaker signals overlooked . . . hope the N.G.R. rule will be retained."—G3FRG.

* * *

Useful check logs and comments are acknowledged from: G2DHV, G3ERD/P, G5DS, G5MR, G6JK/P, GM2HCJ/P and EI2W.

Second 420 Mc/s Contest, 1955

ONLY seven of those active during the 420 Mc/s contest held over two weekends in September actually submitted entries. Of the seven, only four entered seriously; if the other three had not sent in their logs judging would have been even less effective than it was.

It appears that contests provide opportunities for contacts with stations not usually available; once these stations have been worked most members' interest wanes. One entrant thought that more subsidiary prizes would encourage the submission of more entries—a sort of payment for logs!

The greatest distance covered was the 183 mile contact between G3KEQ and G5YV (RST449 both ways). G2XV made an average of 66 points per contact com-

pared with G3KEQ's 37, G3HBW's 35 and G8SK/P's 36. G2XV's performance is particularly creditable as his transmitter had an r.f. output of only 5 watts, although last year's winner did remarkably well with only 5 watts input.

Equipment varied considerably although two entrants used G3BKQ-type converters.

G3KEQ: Transmitter—QQV03/20 tripler, QQV03/20 p.a. Receiver—G3BKQ-type converter into HRO tuning 24-28 Mc/s. Aerial—four skeleton slots, full wave spaced, 35ft high.

G2XV: Transmitter—6AG7, QV04-7, QV04-7, 832A, QQV06/40 tripler. Receiver—crystal mixer, injection at 400 Mc/s, 6BQ7A i.f. to Hallicrafter SX28A tuning 32-38 Mc/s. Aerial—20 driven elements with 20 reflectors at 40ft.

G3HBW: Transmitter—832 (144 Mc/s), QQV06/40 (tripler), QQV06/40 (driver), ACT22 p.a., 100 watts input, 60 watts r.f. output. Receiver—DET24 r.f. (2 stub input matching), 446A r.f., p.p. crystal mixer with crystal oscillator chain, i.f. unit, to AR77 tuning 25-31 Mc/s. Aerial—16 element colinear stack fed through balun with 2 stub transformer at 30ft.

Stations known to have been active during the contest were as follows: G2CD, 2DD-/P-/M, 2MV, 2RD, 2QV, 2WJ, **2WS, 2XV,** 2AIH, 2AIW, 2BVN, 2DDD, 2DSP, 2FKZ, 2FNW, 2HDJ, 2HDY, 3FP, 3MI, 3WW, 3CGQ, **3COJ/A,** 3ECA, 3EGV, 3FUL, 3FZL, 3GDR, 3GZM/P, **3HBW,** 3IOO, 3JQN, 3KEQ, 4KD, 5CD, 5DS, 5DT, 5KW, 5RD, **5UM,** 5YV, 6NF, 6YU, **8SK/P.** (Entrants in bold face type.)

Results of the Second 420 Mc/s Contest, 1955

Position	Call-sign	Location	Contacts	Points
1	G3KEQ	Sanderstead	51	1851
2	G2XV	Trumpington	27	1783
3	G3HBW	Bushey Heath	37	1308
4	G8SK/P	2 m. S.W. of Dunstable	31	1121
5	G5UM	Knebworth	8	211
6	G2WS	Tadworth	6	76
7	G3COJ/A	Maidenhead	2	60

"1.5 mA at 65 volts"

THE going proved pretty tough in the 1955 Low Power Contest which was held on October 1-2 with a revised set of scoring rules designed to produce the lowest ever power inputs. Nevertheless, the number of contacts made by the winner—I. T. Cashmore (G3BMY) of Blackheath, near Birmingham, using 0.2 watt input for all but 13 of his 85 scoring contacts—was exactly the same as was made by last year's winner with 0.49 watt. But there is little doubt that powers this year were down to the minimum, at least for contest work, and it is significant that for the first time for many years the winner did not use the highest scoring power rating (equivalent to our title): the highest score on the 100 milliwatt level was in fact the 43 contacts made by G3AZ of Bletchley, Bucks, running 1.5 mA at 60 volts, who was narrowly beaten into third place by G6VC of Northfleet, Kent. Some incredibly low powers were used: six entrants were down to the 100 milliwatt level, and some contacts were actually made at between 35 and 45 milliwatts.

G3CGD sums it all up by saying "Before the contest began the prospect of making many contacts with 0.1 watt would have seemed ridiculous, yet after it had been running for a short while I found myself getting annoyed with the 'cloth-eared types' who did not come back."

Equipment

The microbe powers this year caused some hurried work during the second half of September—incidentally the Contests Committee much regrets the short notice of the power change which was not intended at the time when the decision was made. One of the major troubles with such minute inputs is that of devizing methods of ensuring that the equipment is tuned for maximum r.f. output—just try lighting a pea lamp or drawing sparks off the aerial!

The gear used by the leading stations was:—

G3BMY: Transmitter: SP61 (e.c.o.)—half 6J6 (p.a.) fed from a.c. power pack with h.t. stabilized by a CV45 voltage regulator. Break-in keying bias to the e.c.o. Aerial: Half-wave Zepp. Receiver: CR100.

G6VC: Transmitter: single-stage 6AC7 (Clapp) fed from Ekco h.t. unit type AC18 with variable 10,000 ohms resistor in anode circuit. Aerial: 300ft or 100ft Marconi with 100ft counterpoise. Receiver: HRO.

G3AZ: Transmitter: 6AK5 (e.c.o. 35V at 1.6 mA)—6C4 (cathode follower, 60V, at 1 mA)—EF91 (p.a. 60V at 1.5 mA) with 60V dry battery. Aerial: Half-wave end-fed. Receiver: Triple conversion superhet (crystal-controlled first oscillator, tuned i.f. 1500-2000 kc/s and 6 stage 24 kc/s i.f. strip).

Of the transmitters used by the remaining 13 entrants, 7 were two-stage, 5 were three-stage and 1 was a single-stage. An example of the type of problem encountered with QRP is provided by the experience of G3CGD. One of his aerials, after much time and hard labour had been expended, was a majestic quarter-wave high: yet, although tried at various heights and angles, absolutely refused to produce contacts during daylight. It tuned perfectly, had no electrical defects, and the only explanation seems to be that it was positioned about 10ft above a row of small trees.

Comments

The revised rules were commented on by several entrants; the general feeling seems to be that although reducing the minimum to 0.1 watt proved an interesting experiment, it would be better to revert to the 0.5 watt minimum unless further adjustments are made to the scoring differentials. This view is supported by two main considerations: (1) the extremely low power, whilst attractive to QRP specialists, tends to put off newcomers who are particularly welcome in this event; (2) whilst there is no doubt that contacts can be made with other competitors at this power, it is very much more difficult to raise the stations not participating in the event.

Results of Low Power Contest, 1955

Position	Call-sign	Power in Watts	Scoring Contacts	Points
1	G3BMY	0·2–0·5	85	1425
2	G6VC	0·1–0.5	63	1350
3	G3AZ	0·09	43	1340
4	G3CGD/P	0·1–0·45	43	1200
5	G4JW	0·09–2·75	38	763
6	G3RD	0·09	22	720
7	G3GMK	0·5	37	665
8	G5LQ	0·18	30	660
9	G2AVC	0·05–0·1	24	630
10	G8UQ	0·19	23	530
11	G3CNO	3·8	48	508
*	G3EUE	1·0	37	491
12	G3DOP	1–5	33	475
13	G2DHV	2·68	38	456
14	G3GDW	0·2–0·5	21	440
15	G3JHX	0·97	3	69

* *Late entry.*

Check Logs from G3IMK and '6AH are gratefully acknowledged.

National Field Day 1956

Rules

1. The event will commence at 17.00 G.M.T. on Saturday, June 2, 1956 and conclude at 17.00 G.M.T. on Sunday, June 3, 1956.

2. Only properly constituted R.S.G.B. Town or Area Groups within the British Isles, which, for the purposes of the event, comprise the prefix zones G, GC, GD, GI, GM and GW, may enter for the contest.

3. Operators of portable stations competing in the contest must each hold a current British Isles (G.P.O.) Amateur (Sound) Licence, and must be fully paid-up Corporate Members of the Society at the time of the contest.

4. Each competing Group will be permitted to place two stations ("A" and "B") in operation. "A" stations may operate on 1.8 and 3.5 Mc/s or 1.8 and 7 Mc/s and "B" stations on 7 and 14 Mc/s or 3.5 and 14 Mc/s, provided that no "A" station shall work on the same band as its associated "B" station. Both stations may operate from the same site or from different sites, provided they are located within the agreed limits of the area covered by their Regional Representative. It will be permissible for two or more towns or areas within a single region to amalgamate for the purposes of the event.

5. Each station must be licensed to use a different call-sign. Club and other collectively held call-signs are not permitted.

6. Applications to enter N.F.D. may be made only by T.R.s and A.R.s as the case may be. Such applications must be made on the form which will be sent from Headquarters to all T.R.s and A.R.s not later than February 28, 1956. The application is necessary to enter the contest. Frequencies chosen may not be varied after applications have been submitted.

7. Applications, duly signed, addressed to the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1, must be posted not later than March 31, 1956. In no circumstances will late entries be accepted.

8. Stations must be operated from tents.

9. No apparatus may be erected on the site prior to 12.00 G.M.T. on June 2, 1956. This rule includes aerials and aerial fittings as well as tented accommodation for the stations. This does not apply to a tent to be used for storage purposes.

10. Any aerials may be used up to a maximum for three per station (including the receiving aerial) subject to the following limitations:—
(a) All aerials and feeders must be constructed from wire of total cross-sectional area not greater than that of 14 s.w.g.
(b) No part of the aerials shall exceed a height of 45ft above ground level.

11. Equipment at any "A" or "B" station must not exceed two transmitters and one receiver. Reserve equipment may be kept available, but not connected.

12. The total d.c. input to the anode circuit of the valve or valves energising the aerial, or to any previous stage of the transmitter, shall not exceed 5 watts.

13. Power for any part of the station shall not be derived from supply mains.

14. The contest is restricted to the use of c.w. (A1) only.

15. An exchange of reports must be made and acknowledged before points may be claimed. In the case of portable to portable contacts between competing stations located in the British Isles (G, GC, GD, GI, GM and GW), this report must include the first three letters of the operator's surname, e.g., RST579 JON (station being operated by W. Jones), and such letters, both incoming and outgoing, together with signal reports, must be entered on the log sheets. Proof of contacts may be required.

16. Contacts with ships, or unlicensed stations located in countries where licences are obtainable, will not count for points. The decision as to whether a station is to be classed as unlicensed will rest with the Contests Committee.

17. Only one contact with a specific station may be made on each band during the contest.

18. Points must not be claimed for contacts made by a competing station with other stations within its own town or area or with members of its own group whether fixed, portable or mobile.

19. Points will be scored on the following basis:—

Between competing stations and—

(a) Fixed, mobile and non-competing portable stations in the British Isles	1 point
(b) Fixed stations in the rest of Europe including Eire	2 points
(c) Fixed stations outside Europe	3 points
(d) Fixed stations in the British Empire	6 points
(e) Competing portable stations in the British Isles -	*3 points
(f) Portable stations in the rest of Europe including Eire	4 points
(g) Portable stations outside Europe	6 points
(h) Portable stations in the British Empire	12 points

*An additional point may be claimed on 1.8 Mc/s ONLY for contacts with a competing portable station in any other British Isles prefix zone (e.g., GM–G or GM–GD contacts on 1.8 Mc/s score 4 points). The six British Isles prefix zones are G, GC, GD, GI, GM and GW.

20. An entry will be valid if signed by the properly appointed T.R. or A.R., who will be solely responsible for the conduct of the event in his Town or Area.

21. Contacts made by any operator whose personal signature does not appear on the covering sheet(s) of the appropriate log(s) will be disallowed.

22. Each station's entry shall consist of extracts from the station log, a separate extract being submitted for each band worked, together with a cover sheet for each band and a summary sheet. Forms for this purpose will be supplied by Headquarters. Entries must reach the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1, post-marked not later than June 20, 1956. In no circumstances will late entries be accepted.

23. In addition to the National Field Day Trophy and miniature replica which will be awarded to the Group obtaining the highest combined score, miniature replicas will be awarded to the Groups with the leading "A" and "B" station scores. Should the winning Group also lead with the highest "A" or "B" station score, it will only be eligible for one replica; the other would not then be awarded. A certificate will be awarded to each of the following: (a) The leading Group on each band; (b) The chief operator of the British Isles or overseas station whose check log shows that he contributed the most points to competitors.

24. The Scottish N.F.D. Trophy (together with miniature) will be awarded to the Scottish Town or Area Group scoring the highest number of points.

25. The Bristol Trophy will be awarded to the Town or Area Group which having entered only one station shall obtain the highest number of points in comparison with other groups entering on a similar basis.

26. The Trophies will be handed to the T.R. or A.R. of the groups concerned, who will be responsible for their safe keeping until their return is requested by Headquarters.

First Top Band Contest, 1956

ALTHOUGH it has not been possible to complete consideration of all the comments made in connection with the "Short Contest" which took place concurrently with the Second Top Band Contest, 1955, it appears that there is considerable support for the idea. For this reason, the Contests Committee has decided to continue the experiment in the January, 1956, event, the rules of which will be the same as those for the Second Top Band Contest, 1955, which appeared on page 129 of the September issue of the BULLETIN.

Entries for the contest, which will take place on January 14 and 15, 1956, must be posted to reach the Hon. Secretary, Contests Committee, R.S.G.B., New Ruskin House, Little Russell Street, London, W.C.1, not later than January 23, 1956.

Changes of Address

MEMBERS are asked to note that it is not possible to print changes of address in the BULLETIN. To do so would use much valuable space.

LONDON MEMBERS' LUNCHEON CLUB
will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road, at 12.30 p.m. on Fridays, December 16, 1955 and February 17, 1956.
Telephone table reservations to HOL 7373 prior to day of luncheon. Visiting amateurs especially welcome.

I.V.H.F. Society Dinner

THE picture of the International V.H.F. Society's Dinner in Dublin on page 215 of the November issue of the R.S.G.B. BULLETIN was reproduced by permission of the *Irish Times*.

Affiliated Societies' Contest, 1956

The attention of all Affiliated Societies is drawn to Rule 1, which requires that entries must be submitted by December 31, 1955.

Region I V.H.F. Contests

AT the recent meeting in Brussels of Region I V.H.F. Managers, the Society's Representative, Mr. F. G. Lambeth (G2AIW) agreed to submit for publication in the December issue of the R.S.G.B. BULLETIN the following v.h.f./u.h.f. contest rules which have been accepted by many Continental I.A.R.U. Member Societies in Region I, for the year 1956 and onwards.

General

Four and only four v.h.f. contests shall be held each year within Region I. The first three will be sub-regional contests to increase activity in each Region I country, but foreign v.h.f. stations can participate if they so wish. The fourth is to be called the European V.H.F. Contest and is to be arranged by a different Region I radio club or society each year. The sequence is, Germany, France, Great Britain, Switzerland, Italy, Austria, Denmark, Holland and Sweden.

Sections of Contest

In each contest there will be four separate sections:
(1) Single-band operation: fixed stations.
(2) Multi-band operation: fixed stations.
(3) Single-band operation: mobile/portable stations.
(4) Multi-band operation: mobile/portable stations.

Mobile/portable stations must remain in the same place during the whole contest and must use /M or /P as applicable. All stations may be operated by one or more operators; only one call-sign, however, may be used. All operators must be fully licensed. Fixed stations must give their exact location and mobile/portable stations their location in distance and direction from the nearest town. The input power must not exceed that specified on the station licence.

Dates

The contests will take place during the following week-ends in 1956: May 5–6, June 16–17, August 18–19, September 8–9 (European V.H.F. Contest organized by D.A.R.C.).

Times

The contests will run continuously from 18.00 G.M.T. on the Saturday until 18.00 G.M.T. on the Sunday.

Number of Contacts

Each station can be worked once only for points on each band. If a station is worked again one contact only will count.

Types of Emission

A1, A2 or A3.

Code Numbers

A code number must be exchanged during each contact consisting of the RS or RST report followed by a serial number beginning at 001 for the first contact. To claim a contact a complete code number must be received.

Points

Distance covered in QSO		145 Mc/s	435 Mc/s and higher
0– 20 km;	0 – 12.4 miles	1 point	2 points
20– 100 km;	12.4– 62.1 miles	2 points	20 points
100– 150 km;	62.1– 93.1 miles	3 points	30 points
150– 250 km;	93.1–155.3 miles	4 points	40 points
250– 350 km;	155.3–217.4 miles	5 points	50 points
350– 500 km;	217.4–311.0 miles	10 points	100 points
500– 700 km;	311.0–435.0 miles	20 points	200 points
700–1000 km;	435.0–621.0 miles	40 points	400 points
1000– — km;	621.0– — miles	80 points	800 points

Multiplier

The multiplier is the number of bands on which contacts are made.

Final Score

The final score will be determined as follows: the sum of all points claimed multiplied by the number of bands used. (A=145 Mc/s; B=435 Mc/s; C=1250 Mc/s).
If two or more stations have the same final score the operator who has contacted the greatest number of stations will be the winner.

Logs

Log sheets must be compiled as shown in the following sample. Logs for the first three contests each year must be sent to the club V.H.F. Manager not more than three weeks after the contest week-end; i.e., they must be postmarked not later than the third Sunday after the contest. Late entries will not be accepted.

Two copies of logs for the European V.H.F. Contest must be sent in the first place to the V.H.F. Manager of the country concerned. Each V.H.F. Manager will check the entries and forward the duplicate log duly certified to the V.H.F. Manager of the society responsible for organising the contest that year, at the latest on the fifth Sunday after the contest.

Awards

Each section winner will receive an award and the competitor with the highest overall score will receive a Challenge Trophy to be held for one year.

Disqualification

Competitors not observing any point in the rules will be disqualified.

Sample Contest Log Sheet

Name ..... Call-sign .....
Location ..... (First) Operator's full address:
Latitude ....
Longitude ....
Height above sea level..... .....
.....
Transmitter final stage.....
Input power .....
Operating frequency .....
Crystal control or v.f.o.?.....
Receiving equipment .....
Aerial .....
Bands used.....(A=145 Mc/s; B=435 Mc/s; C=1250 Mc/s)

Date	Time	Call	QTH	Type	Sent	Rcvd.	QRB	Pts.	Band
3·9	1704	EI2W	Dublin	A3	56001	55012	625 km	20	A
3·9	1729	EI2W	Dublin	A1	549002	539013	625 km	200	B
3·9	1739	G5YV	Leeds	A3	589003	579032	435 km	10	A
3·9	1801	F9CQ/p	St.Valery	A1	579004	569026	205 km	4	A
3·9	1814	F9CQ/p	St.Valery	A1	439005	449027	205 km	40	B
3·9	1842	PAØBL	Den Haag	A1	599006	599031	34 km	2	A
3·9	1854	PAØBL	Den Haag	A1	599007	599032	34 km	20	B
3·9	1909	PAØBL	Den Haag	A1	578008	548033	34 km	20	C
4·9	1002	ON4HN	Antwerp	A3	58105	59132	132 km	3	A

Number of contacts.....; Points.....; Multiplier.....
Final score .....; Sum of distances.....
Number of countries worked.....; Best DX worked.....
Date.....;

I certify that the above details are correct
Operator's signature.....

Pan-Pacific Scout Jamboree Station

VK3WIA, the official federal station of the Wireless Institute of Australia, will be in operation day and night from December 28, 1955, to January 9, 1956, from Clifford Park, Victoria, site of the Pan-Pacific Scout Jamboree, 1955-56. The 14 Mc/s band will be used for international contacts.

Directional "V" beams are being erected on the highest hill in the camp area, the choice of direction being possible at the transmitter site. Scouts and members of the public will be able to visit the "W.I.A. Ham Shack on the Hill" during the Jamboree which will be attended by 15,000 scouts.

The station is being installed at the request of the Organizing Committee.

Technical Articles Wanted

THE Editor will be pleased to consider for publication articles which have a bearing on any aspect of Amateur Radio, including Amateur Television. Short articles of a constructional nature are particularly required.

Society News

The President, Council and Headquarters Staff send

Christmas and New Year Greetings

to Members Everywhere

Our President Elect

MR. Reg Hammans (G2IG), who takes office as President on January 1, 1956, is Chief Engineer of Granada TV Network Ltd., the Programme Contractors for weekdays in the I.T.A. Northern Region which is expected to begin operation in May, 1956.

Licensed since 1929, Mr. Hammans has been Vice-Chairman of the Society's Technical Committee for many years, was awarded the Norman Keith Adams Prize in 1951, and has made many important technical contributions to the Society's Journal. He has specialized in the design and construction of communications receivers and measuring equipment. He represented the Society at International Amateur Radio Union Conferences in Paris, Lausanne and Amsterdam and is a member of the I.A.R.U. Region I International Committee.

Before joining the B.B.C. in 1935, Mr. Hammans was for some years with the International Marine Radio Co. Ltd. Whilst on the staff of the B.B.C. he gained wide experience at Tatsfield Receiving Station and later became head of the Television Unit in the Television Planning and Installation Dept.

Mr. Hammans will deliver his Presidential Address to the Society at a Meeting to be held in the Lecture Theatre of the Institution of Electrical Engineers, London, on Friday, January 27, 1956. His subject will be the single sideband system of transmission which he uses with consistent success at his home station in Orpington, Kent.

His many friends in the Society will join with Headquarters Staff in wishing him a happy and successful year of office.

Society Trophies

SOCIETY Trophies have been awarded by Council for the current year to the following:

B.E.R.U. Senior Rose Bowl: Mr. G. J. Dent (VQ4AQ), winner of the Senior Contest.

B.E.R.U. Junior Rose Bowl: Mr. J. C. van Wyk (ZS6R), winner of the Junior Contest.

Col. Thomas Rose Bowl: Mr. F. J. U. Ritson (G5RI), leading U.K. station in the B.E.R.U. Contest.

N.F.D. Shield and Replica: Gravesend Group.

N.F.D. Shield Replica: Croydon Group (Leading B Station).

1930 Committee: Mr. I. T. Cashmore (G3BMY), winner of the Low Power Contest.

Somerset: Mr. P. G. Day (G6PD), winner of the First Top Band Contest.

Mitchell-Milling: Mr. H. Beaumont (G5YV), winner of the Two Metre Open Contest.

Desmond: To be awarded to the winner of the Second Top Band Contest.

1950 Council: Mr. T. C. Reynolds (B.T.H., Rugby), winner of the D/F National Final.

Edgware: Stourbridge Amateur Radio Society, winner of the Affiliated Societies' Contest.

Bristol Trophy: Slaithwaite Group, leading single station entry in N.F.D.

Scottish N.F.D. Trophy: Glasgow Group.

Houston Fergus: Mr. J. J. Yeend (G3CGD), winner of the Low Power Field Day.

Braaten: Mr. F. J. U. Ritson (G5RI), leading English R.S.G.B. member station in the 1955 A.R.R.L. Telegraphy Contest.

Milne: Mr. C. J. Oliver (GW5SL), leading R.S.G.B. member station, other than English, in the 1955 A.R.R.L. Telegraphy Contest.

Miniatures: Mr. H. T. McFarlane (G8SK), winner of the First 420 Mc/s Contest, and Mr. L. J. Kennard (G3ABA), winner of the First and Second Two Metre Field Days.

* * *

The Council has decided not to award the ROTAB Cup, the Courteny Price Trophy, the Founders' Trophy, the Watts Trophy or Calcutta Key for the current year.

London Meeting

STANDING-ROOM only was the order of the day at the meeting of the Society at the Institution of Electrical Engineers, London, W.C.2, on November 11, 1955, when Mr. G. A. Bird (G4ZU) delivered a lecture entitled "The G4ZU Three Band Minibeam."

The Minibeam—an ingenious development of the three element rotary beam—can be used on 14, 21 and 28 Mc/s without the necessity of retuning. (A précis of Mr. Bird's lecture will appear in an early issue of the BULLETIN.—ED.)

A vote of thanks to the lecturer was proposed by Mr. F. J. Charman, B.E.M. (G6CJ).

R.S.G.B. Film Library

THE Hon. Film Curator (Mr. Leslie Gillham) has been compelled to withdraw from circulation the 1947 D/F event and 1947 N.F.D. films. Both films were found to be extensively damaged after being loaned to an affiliated society. Fresh prints are being made of both films.

Details of all other R.S.G.B. films at present available for display at Group or Affiliated Society meetings can be obtained from Mr. Gillham at 2 Parkstone Avenue, Hornchurch, Essex.

The General Secretary is not Retiring

THE General Secretary wishes it to be made known that he does not expect to retire from his present office for at least seven years. The announcement in the November issue of the BULLETIN regarding a Deputy General Secretary has given rise to a rumour that Mr. Clarricoats will be retiring quite shortly.

The 21 Mc/s Band

MEMBERS are reminded that the 21 Mc/s band is an exclusive amateur allocation. The current U.K. Amateur (Sound) Licence makes this point clear although earlier copies of the licence erroneously showed the band as being shared with other services.

Headquarters will be glad to investigate reports of "intruders" operating in this band. Reports of such transmissions should include callsign, frequency, time and service.

Power Input to E.G.T. P.A. Stages

FROM time to time members enquire how the power input to earthed grid p.a. stages should be measured. In the opinion of the Society's Technical Committee, the power input, effectively, to such a final stage should be reckoned as 10 per cent greater than the product of the anode volts and anode current to that stage. One proviso is, however, included to prevent unreasonable driving power being employed: that proviso is that the power input to the driving stage should not exceed 50 per cent of the d.c. power input to the driven stage.

Council Ballot Scrutineers

AT the Ordinary Meeting of the Society held at the Institution of Electrical Engineers, London, on November 11, 1955, Messrs. C. Collins (G8SC) and A. M. Rix (G3IVO) were appointed scrutineers of the Council Ballot.

Society Tie—New Price

DUE to changes in Purchase Tax rates the price of the Society tie has been increased by one shilling to 16/- (by post 16/6d.).

CHRISTMAS HOLIDAYS

Members are asked to note that Headquarters' will be closed from 2.30 p.m. Friday, December 23, until 9.15 a.m. Wednesday, December 28. Copy for the January issue will be accepted up to Friday, December 30.

Affiliated Societies

THE following are additions to the list of Affiliated Societies published in the October, 1955, issue of the BULLETIN:—

Bedford School Radio Club, c/o G. E. R. Blakely, 17 Pemberley Avenue, Bedford.

Kinloss Amateur Radio Club (GM3HRZ), c/o Cpl. I. G. Winter, Hut 15, R.S.F., R.A.F., Kinloss, Morayshire.

LONDON MEETINGS

The following programme of meetings at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2, has been arranged.

December 16, 1955: **Annual General Meeting and Presentation of Trophies.**

January 27, 1956: **Presidential Address by R. H. Hammans (G2IG).**

February 24, 1956: **420 Mc/s Evening arranged by members of the London U.H.F. Group.**

March 23, 1956: **"COLOUR TELEVISION" by P. Carnt, B.Sc.(Eng.), A.M.I.E.E. (Research Laboratories, The General Electric Company Ltd.).**

Science Museum Project

The Story Behind the Call—GB2SM

CONSIDERABLE interest has already been aroused among visitors to the Communications Section at the Science Museum, South Kensington, London, by the Amateur Radio station now in operation there. The station, which uses the call-sign GB2SM, is under the direction of Mr. G. R. M. Garrett (G5CS), Deputy Keeper, and his assistant, Mr. Geoff. Voller (G3JUL). One of the objects of the station is to bring Amateur Radio and electronics to the notice of schoolboys and students.

Geoff Voller (G3JUL), chief operator of GB2SM, with a visitor to the station. The equipment shown in this picture comprises (from left to right), Labgear 150 watt all-band rack-built transmitter, Labgear LG.300 table top transmitter, G.E.C. BRT400 and Eddystone 680X receivers. The microphone is an Acos crystal type.

(Photo by courtesy of the Science Museum)

Although GB2SM is in its very early stages, and despite an incredibly high noise level, nearly 40 countries, including Australia and New Zealand, have been worked, principally on 14 Mc/s. Advantage has also been taken of recent openings on 28 Mc/s. The present equipment includes G.E.C. BRT400 and Eddystone 680X receivers, and Labgear LG.300 and 150 watt all band transmitters with which an Acos crystal microphone is used.

At the moment, a 14 Mc/s folded dipole well over 100ft above the street level and suspended between two buildings, is the only aerial, but a similar array for 28 Mc/s is under construction. Ultimately it is hoped to erect a 40ft tower on the roof of the Museum to carry rotary beams for 14, 21 and 28 Mc/s, as well as arrays for 144, 420 and 1,250 Mc/s. The D.S.I.R. Radio Research Station at Slough and Mr. F. J. Charman, B.E.M. (G6CJ), are co-operating in the design of the aerial systems.

Members of the Society's Technical Committee are responsible for technical advice in the development of the station. Future plans include the building of a modern operating console, displays of simple equipment, and operation on v.h.f. and u.h.f.

R.S.G.B. News Bulletin Service
GB2RS 3600 kc/s
Sundays—10.00 G.M.T.

Council Proceedings

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, October 10, 1955, at 6 p.m.

Present.—The President (Mr. H. A. Bartlett in the Chair), Messrs. W. H. Allen, C. H. L. Edwards, D. A. Findlay, R. H. Hammans, F. Hicks-Arnold, J. H. Hum, R. G. Lane, W. H. Matthews, A. O. Milne, L. E. Newnham, W. A. Scarr and John Clarricoats (General Secretary).

Apologies for Absence

Apologies for absence were submitted on behalf of Messrs. L. Cooper and W. R. Metcalfe.

Absent.—Mr. H. W. Mitchell.

• • •

Membership

(a) *Resolved* (i) to elect 51 Corporate Members and 6 Associates; (ii) to grant Corporate Membership to 6 Associates who had applied for transfer.

(b) The Secretary reported that of the 629 members whose subscription became due on July 1, 1955, 122 became overdue on September 30, 1955. Of this number 24 were London, 77 were Country and 16 were Overseas Corporate members and 5 were Associates. Of those overdue, 8 London, 41 Country and 13 Overseas members held call-signs.

The Secretary submitted details of the 14 members who had written to resign during the four weeks ended October 8, 1955. Of this number 2 had resigned on financial grounds, 6 gave no reason and 6 stated they had lost interest.

News Bulletin Service

The Secretary reported on the success of the News Bulletin Service to date and stated that a great many favourable reports had been received. He mentioned that the view had been expressed that the Bulletin should be transmitted at a different hour in order to avoid a clash with church services.

Resolved that the News Bulletin Service should commence at 10.00 G.M.T. as from Sunday, November 27, 1955.

A discussion took place on the desirability or otherwise of continuing to send an abridged version of the Bulletin by telegraphy but no resolution came before the meeting.

The Secretary reported that Mr. E. H. Hutchins of Boscombe, Hants, had donated to the Society a microphone holder for use at GB2RS. The holder had been made with plastic thread on perforated zinc.

Resolved to place on record the thanks of the Council to Mr. Hutchins for his kindness.

Headquarters Station

The Secretary submitted a letter from a member resident in Pontefract of which the following is a copy:—

"Council Proceedings in the current BULLETIN state: It was reported that £26 4s. 7d. nett had been realised on the sale of Headquarters Station equipment and valves. Does this mean £26 4s. 7d. or is it a misprint for £265 4s. 7d.? Whatever the sum involved, I would be pleased to know what equipment was for disposal, how it was advertised, what prices were realised for individual items, and who were the buyers."

Resolved to authorise the Secretary to explain to the member in question that members generally were invited to submit offers for the various valves associated with Headquarters station; that no worth-while offers were received; that the equipment had to be disposed of as quickly as possible in order to provide more accommodation in the Council Room for the enlarged Council; that the equipment and valves for disposal were offered to a reliable trade member of the Society for sale on the open market; that a statement showing all sales was submitted to the Council by the member concerned; that the Council agreed to allow the member concerned to deduct his expenses and to take a commission on the sale.

TVI Case

The Secretary submitted a letter from a member in Portsmouth dealing with a particularly difficult case of TVI. *Resolved* to authorise the General Secretary to advise the Radio and Accommodation Department of the G.P.O. of the facts as reported and to ask for a meeting to be convened as soon as possible between the G.P.O. Liaison Committee and G.P.O. representatives.

Audit Fee

The Secretary submitted a letter from the Society's Auditors in which they asked that consideration be given to the question of restoring the audit fee to 100 guineas. *Resolved* to restore the audit fee paid to Edward Moore & Sons to 100 guineas.

N.F.D. and Affiliated Societies

Resolved to advise the Contests Committee that the Council is now of the opinion that affiliated societies, as such, should not take part in National Field Day.

Cash Account

Resolved to accept and adopt the Cash Account for September, 1955, as prepared and submitted by the General Secretary.

Annual Report

The Secretary submitted a draft Annual Report for the year ended June 30, 1955. *Resolved* to authorise publication of the Report in the November issue of the BULLETIN.

Auditors' Report and Audited Accounts

The Secretary submitted the Auditors' Report and Audited Accounts for the year ended June 30, 1955.

Resolved (a) to receive the Report of the Auditors for the year ended June 30, 1955, a copy of which had been sent to each Member of the Council prior to the meeting; (b) to accept the Audited Accounts of the Society for the year ended June 30, 1955; (c) to authorise the appropriate officers to sign the Accounts on behalf of the Society; (d) to authorise publication of the Accounts in the November, 1955, issue of the R.S.G.B. BULLETIN.

Reports of Committees

R.A.E.N.

Resolved to receive, as a Report, the Minutes of a Meeting of the Committee held on September 17, 1955.

Exhibition (Home Constructors' Section).

Resolved to receive, as a Report, the Minutes of a Meeting of the Committee held on October 8, 1955.

The meeting terminated at 8.25 p.m.

Forthcoming Events

REGION 1

Blackpool (B. & F.A.R.S.).—No meeting in December.
Bury.—January 12, 7.30 p.m., 52 The Drive, Seedfield, Bury.
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., Tarran Hut, Y.M.C.A., Chester.
Crosby. — Tuesdays, 8 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo.
Isle of Man (I.o.M.A.R.S.).—December 21, January 4, 18, Manor Guest House, Victoria Road, Douglas.
Lancaster (L. & D.A.R.S.).—January 4, 7.30 p.m., George Hotel, Torrisholme.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., Community Centre, Penny Lane, Liverpool, 15.
Manchester (M. & D.R.S.).—January 2, 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester. **(S.M.R.C.).**—Fridays, 7.45 p.m., Ladybarn House, Mauldeth Road, Manchester, 14. **(North West Group).** Annual Hot Pot Supper, December 23, Stocks Hotel, Walkden.
Preston.—December 16, 30; January 13, 27, 7.45 p.m., "The Copper Kettle," Garstang Road, Barton, nr. Preston.
Rochdale (R.R.T.S.).—Fridays, 7.45 p.m., 1 Law Street, Sudden.
Southport.—Thursdays, 8 p.m., Sea Cadets Camp, Esplanade, Southport.
Stockport (S.R.S.).—December 21, January 4, 18, 8 p.m., The Blossoms Hotel, Stockport.
Warrington (W. & D.R.S.).—December 15, January 5, 19, 7.30 p.m., Kings Head Hotel, Winwick Street, Warrington.
Wirral (W.A.R.S.).—December 21, January 4, 18, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Bradford. — December 27, January 10, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Catterick.—Wednesdays, 7 p.m., Loos Lines.
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.
Doncaster.—January 11, 7.30 p.m., Y.W.C.A., Cleveland Street.
Gateshead. — Mondays, 7.30 p.m., Mechanics' Institute, 7 Whitehall Road.
Hull.—December 27, January 10, 7.30 p.m., "Rampant Horse," Paisley Street.
Leeds.—Wednesdays, 7.30 p.m., 4 Woodhouse Square.
Middlesbrough. — Thursdays, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.
Pontefract. — December 15, December 29, 8 p.m., Queen's Hotel, Tanshelf.
Rotherham.—Wednesdays, 7 p.m., "Cutlers Arms," Westgate.
Scarborough. — Thursdays, 7.30 p.m., B.R. Rifle Club, West Parade Road.
Sheffield (S.A.R.C.). — January 8, 8 p.m., Albreda Works, Lydgate Lane; January 11 (Annual Dinner), 7 p.m., Arcade Restaurant, Sheffield and Ecclesall Co-operative Society, Ecclesall Road.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spenborough.—January 11, 7.30 p.m., Temperance Hall, Cleckheaton.
York. — Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South).—January 6, 7.30 p.m., A committee room, Cadbury Bros., Bournville Lane. **(M.A.R.S.).**—December 20, 7 p.m., Midland Institute. **(Slade).**—January 6, 7.45 p.m., Church House, High Street, Erdington.
Coventry.—December 16, 7.30 p.m., Priory High School, Wheatley Street. **(C.A.R.S.).**—December 23, January 2, 7.30 p.m., 9 Queen's Road.
Kenilworth, Leamington and Warwick. — December 15, 7.30 p.m., Dalehouse Lane, Leamington.
Malvern.—January 2, 8 p.m., "Foley Arms."
Redditch. — December 15, 29, January 12, 8 p.m., "Scale and Compass," Birchfield Road.
Rugby.—January 5, 8 p.m., B.T.H. Recreation Club, Hillmorton Street.
Solihull.—January 2, 7.30 p.m., Defence H.Q., Sutton Lodge, Blossomfield Road.
Stoke-on-Trent. — December 28, 8 p.m., "Lion's Head," John Street, Hanley.
Stourbridge (St.A.R.S.).—January 3, 8 p.m., King Edward VI School.
Walsall.—December 28, January 11, 8 p.m., Technical College, Bradford Place.
Wolverhampton.—December 19, January 2, 9, 8 p.m., Nechells Cottage, Stockwell Road, Tettenhall.

REGION 4

Alvaston. — Tuesdays, Thursdays, 7.30 p.m.; Sundays, 10.30 a.m., Nunsfield House, Boulton Lane.
Chesterfield. — Tuesdays, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—Wednesdays, 7.30 p.m., Room 4, 119 Green Lane, Derby.
Ilkeston (I. & D.A.R.S.).—Thursdays, 7 p.m. Room 5, College of Further Education, Field Road.
Leicester (L.R.S.).—December 19, January 9, 7.30 p.m., Hollybush Hotel, Belgrave Gate.
Lincoln (L.S.W.C.).—January 4, 7.30 p.m., Technical College, Cathedral Street.
Mansfield (M. & D.A.R.S.).—January 3, Denman's Head Hotel, Market Place, Sutton-in-Ashfield.
Newark.—January 2, 7 p.m., Northgate House, Northgate, Newark.
Northampton (N.S.W.C.). — Fridays, 7 p.m., Club Room, 8 Duke Street.
Nottingham.—December 16, 7.30 p.m., Sherwood Community Centre, opposite Woodthorpe Drive, Sherwood.
Peterborough. — January 4, 7.30 p.m., 21 Hankey Street.
Worksop.—January 5, 7 p.m., King Edward Hotel.

REGION 5

Chelmsford.—January 5, 7.30 p.m., Marconi College, Arbour Lane, Chelmsford.
Lowestoft and Beccles (L. & B.A.R.C.). — December 28, January 11, Y.M.C.A., Lowestoft.

REGION 6

Gloucester.—Thursdays, 7.30 p.m., The Cedars, 83 Hucclecote Road
Oxford (O. & D.A.R.S.). — December 28, January 11, 7.30 p.m., Club Room, "Magdalen Arms," Iffley Road, Oxford.
Portsmouth. — Tuesdays, 7.30 p.m., British Legion Club, Queen's Crescent, Southsea.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.

REGION 7

London.—December 16 (A.G.M.), January 27 (Presidential Address), 6.30 p.m., I.E.E., Victoria Embankment.
London (L.M.L.C.).—December 16, 12.30 p.m., Bedford Corner Hotel.
London (U.H.F. Group).—January 5, 7 p.m., Bedford Corner Hotel (Annual Dinner).
Acton, Brentford and Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick, W.4.
Barnes, Putney and Richmond.—January 6, 337 Upper Richmond Road, S.W.14.
Bexleyheath.—December 22, January 12, 7.30 p.m., Congregational Hall, Chapel Road.
Bromley (N.W.K.A.R.S.).—January 6, 8 p.m., Shortlands Hotel, Station Road, Shortlands, Kent.
Chingford.—December 23, January 6, venue from G4GA (SIL 5635) or B.R.S.19675 (SIL 6055).
Croydon (S.R.C.C.).—January 10, 7.30 p.m., "Blacksmith Arms," 1 South End, Croydon.
Dorking. — Tuesdays, 7.30 p.m., 5 London Road.
Ealing.—Sundays, 11 a.m., ABC Restaurant, Ealing Broadway, W.5.
East Ham.—January 3, 12 Leigh Road.
East London.—December 18, 2.30 p.m., Ilford Town Hall (A.G.M.).
East Molesey (T.V.A.R.T.S.). — January 4, 8.30 p.m., Carnarvon Castle Hotel (A.G.M.).
Enfield.—December 18, 3 p.m., George Spicer School, Southbury Road, Enfield.
Finsbury Park.—December 20, 7.30 p.m., 16 Albion Road, Stoke Newington, N.16.
Harlow (H. & D.R.S.).—Tuesdays, 7.30 p.m., rear of G. E. Read (G3ERN), 6 High Street.
Hendon and Edgware.—Wednesdays, 8 p.m., 21 Goodwins Avenue, Mill Mill.
Hoddesdon.—January 5, 8 p.m., "Salisbury Arms."
Holloway (G.R.S.).—December 16 (Junk Sale), recommencing January 8, Mondays and Wednesdays (R.A.E.), Fridays, 7 p.m., Grafton School, Eburne Road, N.7.
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road.
Kingston (K. & D.R.S.).—Alternate Wednesdays, 7.45 p.m., Penrhyn House, Penrhyn Road.
Lewisham (R.A.R.C.).—Wednesdays, 8 p.m., Durham Hill School, Downham.
Norwood.—December 17, 7.30 p.m., Windermere House, Westow Street, Crystal Palace.
Slough.—January 3, venue from G2HOX or G3BTP, 13 Quaves Road, Slough.
Southgate and Finchley.—January 12, Arnos School, Wilmer Way.
Sutton & Cheam (S. & C.R.S.).—December 20, January 20, "The Harrow," Cheam Village.
Welwyn Garden City. — January 2, 8 p.m., G2NR, 22 Elmwood (Round-table meeting).

REGION 8

Brighton (B.D.R.C.). — Tuesdays, 7.30 p.m., "Eagle Arms," Gloucester Road
Chatham (M.A.R.T.S.).—December 27, January 10, 7.30 p.m., "Golden Lion," High Street, Brompton.
Hastings (H. & D.R.C.).—December 19, January 2, 16, 7.30 p.m., Saxon's Café, Denmark Place.
Isle of Thanet (I.o.T.R.S.).—Fridays, 7.30 p.m., Hilderstone House, Broadstairs.
Sussex R.A.E.N.—December 17, 8 p.m., King's Head, Fishersgate.
Worthing (W. & D.R.C.).—January 10, 8 p.m., Adult Education Centre, Union Place.

REGION 9

Bath.—December 19, 7.30 p.m., 12 Pierrepoint Street.
Bristol.—January 20, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol, 1.
Exeter.—January 6, 7 p.m., Y.M.C.A., St. David's Hill.
Falmouth (W.C.R.C.). — Alternate Tuesdays, 7 p.m., Technical Institute.
North Devon.—January 5, G2FKO, 38 Clovelly Road, Bideford.
Plymouth.—December 17, January 21, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.
Torquay.—December 17, January 21, 7.30 p.m., Y.M.C.A., Castle Road.
Weston-super-Mare.—January 11, 7.30 p.m., R.A.F.A.R.S., R.A.F. Locking.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road, Yeovil.

REGION 10

Cardiff.—January 9, 7.30 p.m., "The British Volunteer," The Hayes, Cardiff.
Neath and Port Talbot.—January 3, 7.30 p.m., Royal Dock Hotel, Briton Ferry.

REGION 13

Dunfermline. — Thursdays, 7.30 p.m., behind 34 Viewfield Terrace, Dunfermline.
Edinburgh. — January 12, 26, Chamber of Commerce Rooms, 25 Charlotte Square, Edinburgh, 2.

REGION 14

Falkirk.—December 30, January 13, 7.30 p.m., The Temperance Café, High Street, Falkirk.
Glasgow.—December 23, 7.15 p.m., Christian Institute, 70 Bothwell Street, Glasgow, C.2.

Regional & Club News

Aberdeen Amateur Radio Society.—At the A.G.M. in November, the following were elected: *President:* E. G. Ingram (GM6IZ); *Vice-President:* C. Sherritt (GM3EOJ); *Hon. Secretary and Treasurer:* A. G. Knight (B.R.S.19114); *Committee Members:* J. Gall, W. Beaton (GM3DWX), I. C. Sinclair (GM3ICS) and G. T. Donaldson (GM3FKS).

Acton, Brentford & Chiswick Radio Club.—Meetings are held on Tuesday evenings at the A.B.C. Club, 66 High Road, Chiswick, when visitors and prospective members will be made most welcome. The club has it own licence (G3IIU) and other facilities. Full details may be obtained from the *Hon. Secretary:* Robert G. Hindes (G3IGM), 51 Rusthall Avenue, Bedford Park, Chiswick, W. 4.

Bristol.—At the November meeting D. V. Newport (G3CHW) gave a talk entitled "Some Fundamentals of Frequency Modulation." G3CHW was also the winner of the Group's C.W. Contest held on October 23 and was presented with a copy of the *A.R.R.L. Antenna Book* in recognition of his success. The T.R. (G2FYT) was runner-up. Members interested in Slow Morse classes should contact either G2HDR or G3KPT. G3RQ and B.R.S.14627 have been re-elected as *Hon. Secretary-Treasurer* and *Hon Auditor* respectively for 1956.

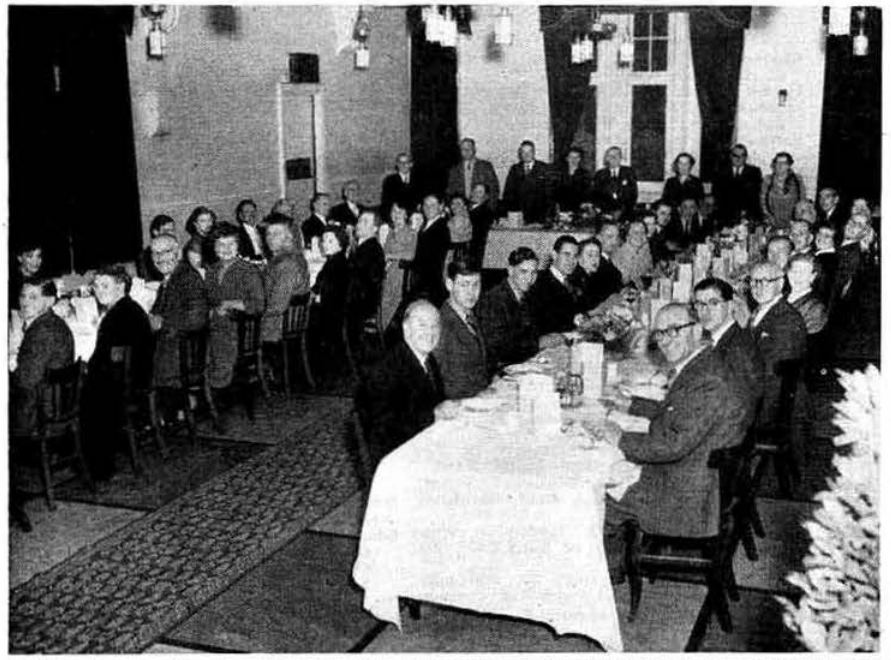
Cardiff.—At the meeting on January 9, GW3AHN will lecture on aerials. *Town Representative:* R. M. Morris (GW3HJR), "The Shack," St. Cenydd Road, Caerphilly, Glam. Meeting place "The British Volunteer," The Hayes.

Grafton Radio Society.—Recent activities have included a QSL card display and participation in the Islington Handicrafts Exhibition. Talks have been given by P. Solder (G5FA) on "Ins and Outs of DX Working" and by B. Wardman (G5GQ) on "N.B.F.M." The club is closed for the Christmas recess and will re-open on January 8. *Hon. Secretary:* A. W. H. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

Lothians Radio Society.—Meetings at 25 Charlotte Square, Edinburgh, are arranged for 7.30 p.m. on December 15 ("70 cm DX-pedition to Drumore," by J. W. Kyle, GM6WL), January 12 ("Hints on Mobile Operation," an R.S.G.B. recorded lecture by C. H. L. Edwards, G8TL) and January 26 ("Band III Converters," by F. Tuck, GM3BBW). Classes for the R.A.E. and Morse test are held regularly. Visitors and prospective members are always welcome. *Hon. Secretary:* John Good, 24 Mansionhouse Road, Edinburgh 9.

Basil O'Brien (G2AMV), Region 1 Representative, replying to the toast of "The R.S.G.B." at the Annual Dinner of the West Lancashire Radio Society held at the Mitre Hotel, Liverpool, on October 8. Others in the picture are, from left to right, Miss McCracken, Mrs. O'Brien, T. Scarle (Chairman), S. Turner (G3JUB) and D. Vaughan (G3JUA).

Midland Amateur Radio Society.—Seventy-two members and guests attended the Society's Annual Dinner at the Imperial Hotel, Birmingham, on November 12. Trophies were presented to E. Shackleton (G6SN) and G. Smith (G3HDK). The Christmas Party will be held on December 20 at 7 p.m. Meetings are held on the third Tuesday in each month at the Midland Institute, Paradise Street, Birmingham. Visitors will be cordially welcomed. *Hon. Secretary:* C. J. Haycock (G3JDJ), 360 Portland Road, Birmingham 17.



A picture taken at the Annual Dinner of the Slade Radio Society held in Birmingham on November 5, 1955, with Mr. Chilvers (President) in the chair.

Nottingham & District Amateur Radio Society.—Activities at recent meetings have included a Junk Sale and a talk on the "History of Radio" by M. Dransfield (G3JKO). A quiz contest between Lincoln, Newark and Nottingham took place on December 4. On December 16, J. Hobson (G5QZ) will give a lecture on "Beam Aerials." *Hon. Secretary:* F. M. L. Hyde, 77 Sherwood Vale, Nottingham.

QRP Society.—The winners of the society's Portable Amateur Equipment Contest were G3CGD, G3JNB and G3HMR. The formation of a group catering specially for schools' science sections is under consideration. A certificate is now available to any short wave listener who has heard ten or more transistor-operated stations. *Hon. Secretary:* John Whitehead, 92 Rydens Avenue, Walton-on-Thames, Surrey.

Ravensbourne Amateur Radio Club.—The club's receiving contest was won by Messrs. Wilkinson, Haynes and Ambrose. G3HEV, the club station, is active on 21 Mc/s. Meetings are held on Wednes-

days commencing at 8 p.m. at Durham Hill School, Downham. *Hon. Secretary:* J. H. F. Wilshaw (B.R.S.18936), 4 Station Road, Bromley, Kent.

Romford & District Amateur Radio Society.—The programme for meetings, which are held at RAFA House, 18 Carlton Road, Romford, on Tuesdays at 8.15 p.m. includes film shows, lectures and junk sales. The society's net meets on 28 Mc/s every Saturday evening and includes G2BVN, G2FWJ, G3AUG, G3EBF and G3FKJ. *Hon. Secretary:* N. Miller, 55 Kingston Road, Romford.

Sheffield Amateur Radio Club.—The Annual Dinner will be held at the Arcade Restaurant, Sheffield and Eccleshall Co-operative Society, Eccleshall Road, on January 11, at 7 for 7.30 p.m. There will be a licensed bar. Tickets, price 8/6, may be obtained from the *Hon. Secretary:* C. Leadwood, 103 Bodmin Street, Sheffield 9.

Shefford & District Amateur Radio Society.—Meetings will be held at Digswell House at 8 p.m. on December 16 (Technical Film Show), January 6 ("Amateur Television Engineering," Ian Waters), and January 13 (Mullard Film Strip Lecture). The A.G.M. is arranged for January 20. *Hon. Secretary:* G. R. Cobb (G3IXG), 7 Hitchin Road, Shefford.

South Manchester Radio Club.—At the A.G.M. the following were elected: *Chairman:* N. Potter (G3GNC); *Vice-Chairman:* M. Denny (G6DN); *Hon. Treasurer:* N. Ashton (G3DQU); *Hon. Secretary:* M. Barnsley (G3HZM), 17 Score Street, Bradford, Manchester 11; *Committee Members:* J. R. Knight (G3JRK), R. Pearson (G3KKH), J. Rathbone and C. Charlton (G3KKG). Meetings are held on Friday evenings at Ladybarn House, Mauldeth Road, Fallowfield, Manchester 20. On December 16 there will be a Junk Sale and on January 13 two lectures—"Hints on soldering" by G. Kenyon (G3HMF) and "How to solder aluminium" by P. Lougher. Classes in preparation for R.A.E. are held on Mondays.

Spen Valley & District Radio and Television Society.—The Annual Dinner will be held at Dewsbury on January 21 when Mr. B. Marsden of the Associated Broadcasting Co. Ltd., will be the guest of honour. Entertainment will be provided by a member of the Magic Circle and there will be a draw. *Hon. Secretary:* N. Pride, 100 Raikes Lane, Birstall, near Leeds.

Stourbridge & District Amateur Radio Society.—At the meeting on November 1, G3KFE/T gave a lecture on Amateur Television in which he described the various standards used by amateurs and the basic circuit of a flying spot scanner. *Hon. Secretary:* A. K. Davies, 48 Church Avenue, Vicarage Road, Amblecote, near Stourbridge.

At the recent Annual Dinner of the Midland Amateur Radio Society, G. W. C. Smith (G3HDK) was awarded the G2AK Shield. From left to right, G6SN, G3HMG (President), G3HDK, Mrs. G3HMG, Mr. Chilvers (Slade Radio Society) and Mrs. Chilvers.
(Photo by Holloway Studio, Birmingham)

Torbay Amateur Radio Society.—The November meeting was well attended when a R.S.G.B. recorded lecture by Louis Varney (G5RV) was given. The next recorded lecture will be "Inter-planetary Travel" by W. A. Scarr, M.A. (G2WS) on December 17 at the Y.M.C.A., Torquay, commencing at 7.30 p.m. *Hon. Secretary:* L. H. Webber (G3GDW), 43 Lime Tree Walk, Newton Abbot.

West Lancashire Radio Society.—The society's Annual Dinner, which was attended by the R.R., Basil O'Brien (G2AMV), took place at the Mitre Hotel, Liverpool, on October 8. Meetings are held over Gordon's Sweetshop, St. John's Road, Waterloo, at 8.30 p.m. on Tuesdays. *Hon. Secretary:* S. Turner (G3JUB), 5 Balfe Street, Liverpool 21.

A meeting of single side-band enthusiasts was held during the period of the Amateur Radio Exhibition. Mr. Reg Hammans, (President-Elect) is in the centre of the picture with Dr. Desmond Downing, GI3ZY and Mrs. Downing on his right. Mr. E. A. Dedman, G2NH (centre) and Mr. H. F. Knott, G3CU (right) are seated on the floor.

Representation 1956-7

THE Corporate Members listed below have been duly elected to serve in the offices indicated as from January 1, 1956.

Regional Representatives

Region	Name, Call-sign and Address
1	*B. O'Brien (G2AMV), 1 Waterpark Road, Prenton, Birkenhead, Cheshire.
2	*J. R. Petty (G4JW), 580 Redmires Road, Sheffield, 10, Yorkshire.
3	*J. Timbrell (G6OI), Englefield Lodge, Kinver, near Stourbridge, Worcestershire.
4	*E. S. G. K. Vance, M.B. (G8SA), 43 Blackwell Road, Huthwaite, Sutton-in-Ashfield, Nottinghamshire.
5	Office Vacant.
6	N. F. O'Brien, F.B.I., A.C.C.S. (G3LP), 143 Brunswick Street, Cheltenham, Gloucestershire.
7	*F. G. Lambeth (G2AIW), 21 Bridge Way, Whitton, Twickenham, Middlesex.
8	Office vacant from January 1, 1956. No nomination received.
9	*H. A. Bartlett (G5QA), Lendorie, Birchy Barton Hill, Exeter, Devonshire.
10	Office vacant from January 1, 1956. No nomination received.
11	*F. G. Southworth (GW2CCU), "Samlesbury," Bagillt Road, Holywell, N. Wales.
12	L. Hardie (GM2FHH), 91 Inchbrae Drive, Garthdee, Aberdeen.
13	J. Taylor, M.P.S. (GM2DBX), The Pharmacy, Main Street, Methilhill, By Leven.
14	*D. R. Macadie (GM6MD), 154 Kingsacre Road, Glasgow, S.4, Scotland.
15	*J. William Douglas (GI3IWD), 54 Kingsway Park, Cherryvalley, Belfast, Northern Ireland.

**Nominated by the Council.*

Town or Area Representatives

Region	Town or Area	Name, Call-sign (or B.R.S.) and Address
1	CHESHIRE	
	Wirral Area	F. N. Kendrick (G3CSG), 25 Cook Road, Leasowe, Wirral.
	LANCASHIRE EAST	
	North Manchester ...	L. G. Cratchley (G3IXC), 18 Duckworth Road, Prestwich.
	South Manchester ...	G. C. Kenyon (G3HMF), 87 East Road, Longsight, Manchester, 12.
	Preston	H. A Woods (G2AXH), 13 Merrick Avenue, Farringdon Park.
	LANCASHIRE WEST	
	Crosby, Liverpool ...	F. W. Clasby (G3KFC), 78 Selby Road, Orrell Park, Liverpool, 9.
	Liverpool	C. J. Fox (G3HII), 69 Feltwood Road, Liverpool, 12.
2	CO. DURHAM	
	South Shields and District	E. Smith (G3JMT), 12 Stevenson Street, South Shields.
	NORTHUMBERLAND	
	Newcastle-on-Tyne ...	J. Kitchin (G3JUV), 48 Rothwell Road, Newcastle-upon-Tyne, 3.
	YORKSHIRE EAST	
	York	G. F. Nottingham (G3DTA), 23 Abbotsway, Muncaster, York.
	YORKSHIRE WEST	
	Barnsley	C. T. Malkin (G5IV), 5 White Hill Terrace.
	Leeds	E. Batty (G3DGB), 81 Gledhow Park Grove, Gledhow, Leeds, 7.
2 *contd.*	Pontefract	J. B. Walker (G3CYS), 125 Tombridge Crescent, Kinsley.
	Rotherham	R. Palmer (G4BD), 39 Frazer Road.
	Sheffield	P. A. Wilson (G3HTE), 7 Wolstenholm Road, Sheffield, 7.
3	STAFFORDSHIRE	
	Lichfield	E Arnold Matthews (G3FZW), 1 Shortbutts Lane.
	WARWICKSHIRE	
	Coventry	J. R. Tuck (G6TD), 121 Grayswood Avenue.
	Solihull and District	W. Carter (G5QI), The Ard, Dorridge Road, Dorridge, Warwicks.
	South Birmingham ...	D. Howell (G2DOF), 222 Shenley Fields Road, Selly Oak, Birmingham
	WORCESTERSHIRE	
	Stourbridge and District	F. A. Bills (G3CLG), 29 High Street, Kinver, Staffs.
4	LEICESTERSHIRE	
	Leicester	W. A. Mead (G5YY), 82 Edward Avenue, Braunstone, Leics.
	Melton Mowbray ...	S. Clark (G8CZ), 125 Thorpe Road.
	LINCOLNSHIRE	
	Grimsby and Cleethorpes	F. R. Peterson (G3ELZ), 58 Peaksfield Avenue, Grimsby.
	Lincoln	G. C. Newby (G3EBH), St. Minver, Sudbrooke Lane, Nettleham, Lincoln.
	Scunthorpe	T. Stace (G3CCH), 38 Skippingdale Road.
	NORTHAMPTONSHIRE	
	Northampton ...	S. F. Berridge (G3ITW), 20 Ethel Street.
	Peterborough ...	K. Gasson (G3EPT), 21 Hankey Street.
	NOTTINGHAMSHIRE	
	Mansfield Area ...	A. W. Fowler (G3FR), Cavendish House, Skegby Road, Sutton-in-Ashfield.
	Newark	W. A. G. Davidson (G3EVG), 4 Orston Avenue
	Nottingham	B. Shortland (G3DJL), 58 Bracebridge Drive Bilborough.
	Retford and Worksop	E. Prince (B.R.S.18918), 12 Lidget Lane, Retford.
5	CAMBRIDGESHIRE	
	Cambridge	A. H. G. Waton (G3GGJ), Arkengarthdale, Barton, Cambridge.
	BEDFORDSHIRE ...	
	Shefford and Bedford	G. R. Cobb (G3IXG), Lilac Cottage, 7 Hitchin Road, Shefford.
6	BUCKINGHAMSHIRE	
	High Wycombe ...	A. B. Dixon (G3FAS), 51 Tyzack Road.
	GLOUCESTERSHIRE	
	Cheltenham	J. J. Yeend (G3CGD), 30 St. Luke's Road.
	Gloucester	I. L. Fear (G3DTZ), 83 Hucclecote Road.
	Stroud	A. A. H. Sparrow (G3EKD), Janarth, Farmhill, Stroud.
	HAMPSHIRE	
	Portsmouth	D. Metcalf (G3GHQ), 80 King's Road, Southsea.
	Southampton	M. M. Lovejoy (G3IXN), 14 Iris Road, Bassett.
	CHANNEL ISLANDS	
	Jersey	P. Northey (GC6FQ), Pendeen, Mont Felard.
7	LONDON NORTH	
	Enfield and District	H. Hyman (G3IZQ), 89 Brantwood Road, Tottenham, N.17.
	Southgate and District	S. N. Radcliffe (G3GZB), 56 Crescent Road, Wood Green, N.22.
	LONDON SOUTH ...	
	Coulsdon and Purley	L. C. B. Blanchard (B.R.S.3003), 122 St. Andrews Road, Coulsdon.
	Croydon	C. K. Lawson (G3JCL), 23 Alington Grove, Wallington, Surrey.
	Mitcham and District	D. Johnston (B.R.S.20684), 23 Woodland Way, Mitcham, Surrey.

Region	Town or Area	Name, Call-sign (or B.R.S.) and Address
7 *contd.*	Norwood Area (S.E.19, 20, 25, 26, 27 and S.W.16) ...	E. W. YEOMANSON (G3IIR), 9 Trewsbury Road, Sydenham, S.E.16.
	Sutton and Cheam ...	F. R. SCOTT (G2CZH), 140 Seymour Avenue, Morden Park, Surrey.
	LONDON SOUTH-EAST	
	Gravesend	P. F. JOBSON (G3HLF), 13 Brandon Street, Gravesend, Kent.
	Lewisham Area ...	F. W. GIBBS (B.R.S.20159), 85 Reigate Road, Downham, Kent.
	LONDON SOUTH-WEST	
	Guildford and Woking	D. O'CONNOR (G3GIO), The Royal Arms Hotel, North Street, Guildford, Surrey.
	Kingston Area ...	L. C. CARTER (G3ILC), 35 Barnfield Gardens, Kingston-upon-Thames, Surrey.
	LONDON EAST	
	Chingford	E. M. HALE (G3GFS), 87 Underwood Road, E.4.
	Ilford and District ...	F. F. RUTH (G2BRH), 579 High Road, Ilford, Essex.
	LONDON WEST	
	Acton, Brentford and Chiswick	J. TOVELL (G5LQ), 12 Cambridge Road, Chiswick, W.4.
8	KENT	
	Isle of Thanet ...	J. BARNES (G3BKT), 18 Grange Road, Ramsgate.
	Medway Towns ...	W. B. N. ALTHORP (G2CBA), 85 Copperfield Road, Rochester.
	SUSSEX	
	North-West Area ...	W. L. RIMMINGTON (G2DVD), Batwells, Hayes Lane, Slinfold.
9	BRISTOL	F. H. CHAMBERS (G2FYT), 25 The Crescent, Henleaze.
	DEVON	
	Torbay Area	W. H. BAKER (G3JD), 46 Dower Road, Torquay.
	SOMERSET	
	Bath	J. W. RUSSELL (G2ZR), 45 Shakespeare Avenue.
12	ABERDEENSHIRE	
	Aberdeen	G. JAMIESON (GM3HTL), 93 Craigton Road, Mannofield.
	ANGUS	
	Dundee	A. ROBERTSON (GM3IMU), 65 Church Street, Broughty Ferry, Angus.
13	BERWICKSHIRE	
	Berwick	I. GRAHAM (G3HDT), Gatherick, Duddo, Berwick-on-Tweed.
	FIFESHIRE	
	Dunfermline and District	G. BUCKLE (GM3GQQ), 42 Holborn Place, Rosyth, Fife.
14	STIRLINGSHIRE	
	Falkirk and Stirling	N. HOLDEN (GM4MF), 3 Hodge Street, Falkirk.

Representation—Result of Ballots

Regional Representatives

Region 5

As only three votes were cast in the Election for a new Region 5 Representative, the matter is being referred to the Council.

Region 12

Mr. L. Hardie (GM2FHH)	15 votes	Elected
Mr. E. G. Ingram (GM6IZ) ...	12 votes	

Town Representative

Aberdeen

Mr. G. Jamieson (GM3HTL) ...	13 votes	Elected
Mr. W. A. Mitchell (GM3FRI) ...	10 votes	

Slow Morse

LICENSED amateurs who can spare a few minutes each week to transmit Morse practices on Top Band for the benefit of newcomers to Amateur Radio are invited to write to Mr. C. H. L. Edwards, G8TL, 28 Morgan Crescent, Theydon Bois, Essex, stating times available and operating frequency.

In order to extend the present service and to relieve some of those who have been doing this valuable work for many years, offers are invited from all parts of the United Kingdom.

Letters to the Editor . . .

QSL Percentages

DEAR SIR,—Apropos the little controversy that seems to be afoot re QSL cards and more especially in regard to EI8J's letter in the November BULLETIN, perhaps my own experiences may be of some value to those members who may not yet have formulated a policy for QSLs.

On re-opening after the last War, I decided only to send QSL cards to (*a*) those requesting them and (*b*) those who sent them.

This policy has given rise to the following results

Cards sent	2,259
Cards received	1,846
Received to sent	82 per cent.

A further analysis of the above figures shows that 1,352 were sent to and 1,064 received from stations other than G, GD, etc. *i.e.*, received to sent 79 per cent.

907 were sent to and 782 received from G stations—received to sent 86 per cent.

Over 9 per cent of the 14 per cent G station delinquents were those who requested a card to confirm the contact for contest purposes but who had not the courtesy to acknowledge receipt of mine!

Of the " other than Gs," most of these were Europeans and some were undoubtedly " phoneys."

Yours faithfully,

King's Langley, Herts. J. E. CATT (G5PS).

DEAR SIR,—I have read with interest the correspondence regarding QSL cards, which has arisen from G5UM's Editorial and since EI8J asks in his letter if any amateur has experience of having QSL'd consistently 100 per cent over a number of years, I feel that I should add my contribution.

Having made some 12,000 contacts with 150 countries and since 1938 having always sent my QSL immediately after a first QSO with a station, I feel justified in giving some actual figures of replies received to my QSL cards.

The figures given are percentages of QSLs received to stations worked and each W district and each G group is based on a count of 100-300 cards so that the results should be fairly representative.

W0	68.8	G2 plus 2	49.3	PY	77.0
1	66.2	G2 plus 3	72.7	VK	75.7
2	65.2	G3 plus 2	74.8	ZL	73.7
3	68.3	G3 plus 3	73.5	LU	73.3
4	54.8	G4	64.7	HB	71.8
5	64.6	G5	53.0	VE	71.5
6	77.1	G6	58.0	UA	71.4
7	68.2	G8	69.0	ZS	66.6
8	59.8				
9	54.8				

U.S.A. Average 64.5 U.K. Average 64.1

Until making this count of several thousand cards I, like W3SOH, G2HKU and others, thought the U.S. amateurs were the worst offenders but I must obviously change my opinion now as we Gs are slightly worse.

I have always attached much importance to the QSL. Apart from it being a final act of courtesy, it is surely the confirmation of having worked a genuine station. Most of us on the DX bands have worked " Afghanistan " or " Andorra," to quote only two examples but having received no QSL cards, we strongly suspect that they operated from countries very much better known. There are far too many illicit operators on the air, popping up with any old callsign to make QSOs and I am just not interested in working that type of station.

My own method of dealing with the problem is to work a new station and QSL immediately. I have a simple but very good filing system for keeping a check on stations worked and if a QSL does not arrive in one year from an U.K. station or two years from a foreign station, I never again reply to their CQ calls. Should the station call me off a CQ, I reply advising him of the previous QSO date, the fact that no QSL has been received and that I do not therefore wish to continue the QSO. The result is positive and speedy in that a QSL is usually received and usually by Air Mail.

On the occasions when I receive a QSL addressed to G3LP and I cannot confirm the contact I always mark it " return to sender " and add an explanatory note. Surely this is the use for which QSL cards were devised.

Yours faithfully,

Cheltenham, Glos. NORMAN F. O'BRIEN (G3LP).

The Sending of QSL Cards—" Too Puerile for Coherent Thought "

DEAR SIR,—I am always intrigued by the correspondence when this question of " To QSL or not to QSL " arises; to my mind the whole thing is ridiculous. The idea that adult males should send each other coloured (and sometimes plain) pieces of card bearing stereotyped simple operating signals to prove that they have contacted each other is altogether too puerile for coherent thought as you can well see. (We cannot " well see " because during an average year 1 million QSL cards are handled by the R.S.G.B., which surely proves the necessity of a QSL Bureau—Ed.) Why on earth the Society should encourage this " hobby " by maintaining a full time Bureau and several sub-managers to keep the cards moving is a subject for grave concern among the majority of our most financially minded members and the time may well have arrived for the matter to become the highest priority subject for debate at the next A.G.M.

Yours faithfully,

Birmingham. J. WORTHINGTON (G3COI).

Contest Results

DEAR SIR,—As one who regularly enters for R.S.G.B. Contests whenever circumstances permit, I note with interest the letters on shortening the period between a contest and the publication of the results.

I have often wondered whether the Contests Committee may not be too conscientious in their detailed checking of logs. Suppose, for example, that only the leading five logs were checked, and the remainder were listed in the order of their " claimed scores." By suitable choice of contest date relative to BULLETIN publication date, this limited checking might enable the results to appear in the BULLETIN issue following the contest, adding greatly to the enjoyment of the event, for much of the interest lies in hearing how others fared, while the affray is still vivid in one's mind. True, such " limited checking " might result in X being listed 8th when he should really be 10th, and places 14 and 16 should be interchanged, but I feel that this disadvantage would be outweighed by the quick publication of the leading positions.

May I stress that I am not criticising the Contests Committee for any deficiency in their actions, but rather suggesting that their thoroughness might be reduced to worthwile effect. The Committee have a dreary task checking page after page of serial numbers, and I for one would hurriedly plead other commitments if I were invited to take over their job.

" Limited checking " would scarcely affect G5MP's cosy position down the list. For reasons such as severe hill screening (no television aerials near this road, thank goodness!), a short garden, and a refusal to spoil a view for neighbouring houses by having an aerial above roof-top or tree-top level, or erecting any form of directional aerial, I never expect to be among the leaders, though I put my best into each contest with much resulting enjoyment.

Rapid publication of B.E.R.U. results is another matter; in that contest I often wish some fairly detailed " write-up " of conditions and claimed scores among the Gs would appear in the BULLETIN issue following. Also, I think many would be interested from time to time in seeing the logs of winning stations, as illustrations of choice of bands, rate of scoring, rest periods, etc., in various part of the Empire.

Yours faithfully,

Hythe, Kent. B. W. F. MAINPRISE (G5MP).

DEAR SIR,—There have been several letters regarding publication of N.F.D. results, but little in the way of suggestions to ease the burden on the Contests Committee.

It occurs to me that, with the exception of the highest scoring groups, early publication of results would generally be preferred to absolute accuracy. To the group entering a score entitling them to position 30 it hardly seems worth while waiting for several months to have this changed to 28 or perhaps 32.

May I therefore suggest that the scores of the first 6 or 8 in order of points claimed be checked exhaustively and the remainder be given exactly the score claimed, without any attempt at verification?

If this were done, it is difficult to imagine the actual checking taking longer than 100 hours or so, and the results could be published earlier than ever before to the satisfaction of all concerned, including, no doubt, the Contests Committee.

Perhaps I am wrong in my assessment of the general opinion. Publication of this letter will surely result in some comments however.

Yours faithfully,

Hove, Sussex. E. F. PAUL (G3CUY).

The Morse Code Concession

DEAR SIR,—I am very sorry to see that the R.S.G.B. has prevailed upon the P.M.G. to abolish the compulsory one-year period of c.w. operation for newly-licensed amateurs; this period provided a valuable opportunity for new licensees to acquire "operating sense" without their inevitable mistakes being too obvious either to other amateurs or to the general public. One never hears of listeners to the amateur bands forming a bad impression of the movement because of the activities of c.w. stations, but the irresponsible operation of a telephony transmitter can, and in a regrettably large number of cases does, give such an impression to a large number of casual listeners.

This is in in my opinion a retrograde step, and I hope that if it comes into force permanently, it will not lead to any reduction in the size of those parts of our bands which are set apart by the R.S.G.B. Band Plan for c.w. operation. The enjoyment of c.w. working is to a great extent an acquired taste, and it is inevitable that many fewer operators will trouble to acquire it when they are no longer compelled to do so. This will indeed result in a decrease in QRM in the c.w. bands, but this advantage is by far outweighed by the disadvantages.

Yours faithfully,

Alexandria, Dunbartonshire. WILLIAM H. BORLAND (GM3EFS).

DEAR SIR,—Apropos the announcement made by the G.P.O. with regard to the new licensing conditions governing c.w. operation during the first year after obtaining a licence, and Amateur TV regulations, the position is now quite ridiculous (even if it is only of an experimental nature), full of loopholes and anomalies.

After making some study of the changes, I find that although I have never passed the c.w. test, I can transmit signals on the Amateur TV allotted frequency. In the other amended parts of the conditions, I find that I have to pass a c.w. test, and yet can forget all about it, as I can use 'phone operation as soon as my licence become available. This latter part explodes the idea that it takes one year to learn procedure, etc.

There must be many hundreds of enthusiasts of yesterday who have given up the quest for an Amateur Licence, simply because the Morse test had them licked. I would therefore suggest that these people be brought back into the fold, by giving them a chance to go on the air. After all, if a person can pass the R.A.E. he can surely build and operate a 'phone transmitter.

I have noted with pleasure that American novices have come to "The Month on the Air" column. I trust that the G.P.O. might take a page from the F.C.C. and give budding amateurs their chance to become really interested in this fine hobby.

I am sure many members will thank the G.P.O. Liaison Committee of the R.S.G.B. for the concessions mentioned above, and that subsequent discussions will be even more fruitful.

Yours faithfully,

Hawick, Roxburghshire. G. SHANKIE (B.R.S.20526).

Contests Diary

1956

January 14–15	-	Top Band No. 1
January 28–29	-	B.E.R.U.
February 11–12	-	Affiliated Societies *(Closing date for entries: December 31, 1955)*
May 6	-	Two Metre Field Day No. 1
June 2–3	-	National Field Day *(Closing date for entries: March 31, 1956)*
June 17	-	420 Mc/s Contest No. 1
July 7–8	-	Two Metre
August 19	-	Two Metre Field Day No. 2
September 2	-	Low Power Field Day
September 2	-	1250 Mc/s Tests
September 9	-	420 Mc/s Contest No. 2
October 6–7	-	Low Power Contest
November 10–11		Top Band No. 2
November 24–25		21 Mc/s Phone Contest

The Younger Generation

DEAR SIR,—Constantly we are reminded of the necessity for recruiting young blood into the Amateur Radio movement, and more important, into membership of R.S.G.B. Influx of youth is essential for any organisation which is to remain virile, and helps to ensure future progress.

A simple plan which looks like being successful in this area, involves an approach being made to the chairman of the local Boy Scouts group. Morse lessons and a general outline of the Amateur Radio movement can be given by local members to boys training for the scouts' wireless badge. This can be followed by a visit to the "shack" and an invitation to the local club meeting. The result should be much goodwill and certainly we have nothing to lose.

Remember, that more than one scout group has lent tents and gear for N.F.D. What do other T.R.'s think?

Yours faithfully,

Bromley, Kent. MAURICE J. FROST (G3GNL).

T.R., Bromley and Beckenham

Morse Classes

CLASSES for those wishing to take the G.P.O. Morse Test will be held at Brentford Evening Institute, Clifden Road, Brentford, commencing January 12, 1956, from 7 to 9 p.m. The fee will be 5/-.

Silent Keys

ERNEST REDPATH (G2DS)

The passing of Ernest Redpath (G2DS) on November 5, 1955, removes from the activities of Amateur Radio another "Old Timer." He was continuously active (except for the war years) from 1912 up to a few weeks before his death.

His book *Wireless Telegraphy and Telephony and How to Make the Apparatus*, published by Cassell in 1920, was one of the first to give printed instructions for building wireless sets.

During the early 1920s Ernie Redpath was accurately described as a "well known writer on wireless." At that time he wrote regularly for *Amateur Wireless*. His early works were no doubt primarily responsible for many becoming interested in Amateur Radio. For some years prior to the 1939-45 war he was Sub-ed tor of *World Radio*. During the war he served with the Ministry of Supply.

G2DS was well known in the West Kent district and was Chairman of the Cray Valley Radio Transmitters Club for a number of years and a Past President of the International Short Wave Club (London Chapter).

To his sons and daughters we extend our sympathy in their bereavement. G2ZI

It is with deep regret that we record the passing of the following amateurs:

MISS C. A. MARSHALL (G2HNB).

M. L. TEAGUE (B.R.S.20426).

EXCHANGE AND MART SECTION

As from the January, 1956, issue of the BULLETIN *the following rates will apply to small advertisements in the Exchange and Mart Section:—*

Members' Private Advertisements: 2d. per word, minimum charge, 3/-. (If set in all capitals the charge will be 6d. per word, minimum charge, 9/-.)

Trade Advertisements: 6d. per word, minimum charge 9/-. (If set in all capitals, the charge will be 1/- per word, minimum charge 18/-.)

The charge for a Box Number will remain at 1/6.

When submitting advertisements members should write clearly and avoid ambiguous or uncommon abbreviations.

★

Copy, with remittance, must be sent direct to The National Publicity Co. Ltd., 36–37 Upper Thames Street, London, E.C.4, to arrive by the 22nd of the month preceding publication.

EXCHANGE AND MART SECTION

ADVERTISEMENT RATES. Members' Private Advertisements **2d.** per word, minimum charge **3s.** Trade Advertisements **6d.** per word, minimum charge **9s.** (Write clearly. No responsibility accepted for errors.) Use of Box number **1s. 6d.** extra. Send copy and remittance to **National Publicity Co., Ltd., 36-37 Upper Thames Street, London, E.C.4,** by **22nd** of month preceding date of issue.

A LARGE Screen Television at half price. Decca projection Model 1000. Brand new in maker's carton with guarantee. Picture projected any size up to 4 x 3 feet. Genuine snip. Normal price, £165. Accept 78 guineas. Details from G3HSC, 29 Plough Lane, Wallington. (889

ARMY receiver R107 or R208 wanted. Moderately priced Tape Recorder; also urgently required AR88 cans, switches. Packer, The Mess, Porthcurno, Cornwall. (871

AR88LF, complete 'S' meter, spare valves, etc., £50. BC 221 inbuilt power pack, £15. 100/150 watt transmitter complete modulator, microphone, spares, etc., £30. Numerous valves, resistors, switches, etc. Would accept £80 for the lot and deliver reasonable distance. S.a.e. or call. Hague, 21 Ellingham Road, Chessington, Surrey. (886

AR88LF Good condition, spare set valves, and manual, £37.10.0. Buyer collects. R1224A battery superheterodyne 30–300 metres complete with new h.t., g.b. and 2 V accumulator. Ideal for young Ham. £7. SPE 2029, 2 Hayes Crescent, N.W.11. (875

ASB8 receiver new and complete with valves. Offers to G3GFD, 13 Thornbury Grove, Bradford 3, Yorks. (891

BARGAIN: AR88 with speaker completely overhauled. Price £37. Avinash Electronic Ltd., 27 Oldham Road, London, W.10. (866

CANADIAN transmitter C43, c.w., m.c.w., R/T voice operated switching, 2–12 Mc/s. Final pair 813s, complete, mint and unmodified, with power supply unit, valves, manual; weight: transmitter 2 cwt., p.s.u 3 cwt. Buyer collect, £75. Hallicrafter Sky Champion S.20 New Valves, electrolytics, realigned to laboratory standard. Perfect, £20. Cossor Miniscope, case, spares, perfect, £6. Bubble Sextant, case, as new, £2. CR 100 coil pack, 4 gang, set i.f.t's, b.f.o, valves, manual, new unused, £6. Clough Brangle Standard Signal Generator, 199C, 100 kc/s–32 Mc/s, manual, perfect, £15. West London area. Box No. 874, National Publicity Co. Ltd., 36/37 Upper Thames Street, London, E.C.4. (874

COLLINS TCS transmitter £10: Q Max B4 40 transmitter, harmonic trap and low pass filter, £35. Hammerlund Superpro power supply, £10. Wavemeter W119; A crystal, charts, £2. D104 microphone and stand £3. Woden UM4 £3. Heavy duty autotransformer 115–230 V, £5. BC224, as 348 but with 12 V dynamotor, £20. Valves, 3/- each, 6L6, 6L7, 6AC7, 6AB7, 6K7, 6B8, 6F6Ms, 5/-. Box No. 879, National Publicity Co. Ltd., 36/37 Upper Thames Street, London, E.C.4. (879

EXCHANGE or sell. Bass Reflex cabinet with 10" speaker to Goodmans specification. Handbooks, HRO 358X, NC100. (3) 805s new. Wanted: Pre-selector, oscilloscope, charger or w.h.y. G3AUZ, 32 Harstoft Avenue, Worksop. (873

FOR SALE:—Webbs 150 watt transmitter in 6 standard chassis and panels complete in 6ft rack. Includes:—p.a.—2/4304 c.a., in p.p.—all bands. Exciter—807 c.o.—807 b.a. all bands. Sp. Amp.—6J5, L63, 2/KT66 in p.p. Modulator —2/TZ40 in p.p. with U.M.3. P/pack—giving 400 V and 600 V. P/pack—giving 1000 V. Webbs v.f.o. on 3.5 Mc/s—Variac—D104 microphone. All in perfect condition. No reasonable offer refused. Buyer collects. Offers to J. N. Piper, Station Hotel, St. Andrews. (888

G2BBZ disposing of 10-metre Rotary Beam complete w.b.e. 20 watts Tape Recorder, transmitter/receivers, movie camera and sound projector—films, many other items. Finchley 4468. (868

HAM S/W clearance! Limited quantity. S/W TRF receivers, all bands, hardly used; prices from 35/- only! About 10/- worth new free gear given away with orders! Unrepeatable! Send large s.a.e. without delay to Box No. 862, National Publicity Co. Ltd., 36/37 Upper Thames Street, London, E.C.4. (862

METALWORK.—All types cabinets, chassis, racks, etc., to your own specifications. Philpott's Metal Works, Ltd. (G4BI), Chapman Street, Loughborough. (99

PANDA PR120V £85. AR88LF £35. Class D Wavemeter £4. All in perfect condition. GW5YB, 80 Penrhos Road, Bangor, Caerns. (876

PATENTS and Trade Marks. Handbooks and advice free. Kings Patent Agency, Ltd. (B. T. King, G5TA, Mem. R.S.G.B., Reg. Pat. Agent), 146A Queen Victoria Street, London, E.C.4. Phone: City 6161. 50 years' refs. (98

QSLs and log book (P.M.G. approved). Samples free. State whether G or B.R.S. Atkinson Bros., Printers, Elland. (400

RECONDITIONED Taylor test instruments with factory guarantee for students and amateurs, at low prices. A small quantity of various old models available. Write for details to Taylor Electrical Instruments Ltd., Montrose Avenue, Slough. (865

RME 70—modernised with 2 tuned circuit pre-selector. AR88 type noise limiter. Stabilised and improved R.F. oscillator. Crystal calibrator. Old valves replaced, £30, o.n.o. P. Pennell, 122 Foresters Drive, Wallington, Surrey. (867

R.S.G.B. Band III converter as August BULLETIN. Metal cabinet. Aerial tested, f.b. performance. £8 o.n.o. R.S.G.B. 2-metre converter. Metal cabinet. Thoroughly tested. £5.5.0 o.n.o. 44 Hazell Road, Farnham, Surrey. (877

R107 'S' meter, coaxial input, optional break-in, £11. Megger 500 V, £5. BC221AF with stabilised supply, £15. Avo 'D', £6. 14 Mc/s pre-amplifier, £1. TUs 5B, 6B, 8B, 17/-. ARRL Handbook 1955, 15/-. Adcola with spare elements, bit, 15/-. New 6AK5s, 6J6s, 5/6. Carriage paid on all. Electric drill ¼", £5.10.0. Wolf drill stand, £3.10.0. Cyclemaster and fully equipped BSA, £15. G3DGN, Barnet 9035, "Deegeen," Clifford Road, New Barnet, Herts. (882

IMPORTANT NOTICE

All Exchange & Mart advertisements must be sent with remittance made payable to:

THE NATIONAL PUBLICITY CO., LTD.

36-37 Upper Thames Street, London, E.C.4

The Society and its Advertisement Manager cannot intercede in any matters arising from advertisements appearing in this section.

TRUVOX decked portable recorder E.A.P. amplifier with built-in head amplifier for ribbon microphone £40, less microphone. Delivered free within 50 miles. Southworth, Samlesbury, Holywell. (878

VALVES at 5/- each:—6V6, 6L6, 6J5, 6J6, 6AK5, 12A6, 12AT6, 12AV6, 117Z3, 6SJ7, 6F33. Add 3d. each post. G. A. Jeapes, 129 Cambridge Road, Trumpington, Cambridge. (869

WANTED BC610 Hallicrafters, E.T.4336 transmitters, and spare parts for same. Best prices. P.C.A. Radio, Beavor Lane, Hammersmith, W.6. (626

WANTED Converter for 14, 21, 28 Mc/s. Sale or swop type 54A T9 v.f.o. covering over the 80-metre band with an aerial coupling coil makes excellent transmitter, £2. G2IQ 2 metre converter £2.10.0. Denco CT7 coil pack and chassis brand new, £5. V. Westmoreland, 29 School Road, Langold, Worksop, Notts. (870

WANTED: HRO coils, receivers, power packs, AR88Ds, AR88LFs, SX28s, BC348s, AR77s, and many other types, also laboratory test equipment and R54/APR4, TN17, TN18 and TN19 units. Details please to R. T. & I. Service. 254 Grove Green Road, Leytonstone, London, E.11 (LEY 4986).

WANTED M.O. unit type 123, brand new, for T1403. GI3HXV, 134 Benmore Drive, Finaghy, Belfast. (880

WANTED 50 cycle Selsyns, 85 kc/s or 50 kc/s I.F. transformer, price to Wilkinson, Halfway Garage, Sheerness, Kent. (885

813 valves guaranteed new ex equipment. Complete with base at 41/- including postage. G3GFD, 13 Thornbury Grove, Bradford 3, Yorks. (890

(Continued on page 304)

APPOINTMENTS SECTION

Situations Vacant

ENGINEERS required to service Industrial Radio Frequency Heating Equipment. Good knowledge of basic radio theory essential, specialised training in company's products will be given. Must hold driving licence. Apply in writing, stating age, full details of past experience and salary required to Radio Heaters Ltd., 46 Gray's Inn Road, London, W.C.2. (884

ASSISTANT TECHNICAL SUPERVISORS required by the NIGERIAN BROADCASTING SERVICE for one tour of 12–24 months in the first instance. Candidates may be appointed (a) on agreement with prospect of permanent and pensionable employment in the salary scale (including inducement addition) £750 rising to £1,284 a year or (b) on contract terms with salary scale (including inducement addition) £810 rising to £1,386 a year with a gratuity of £100/150 a year. Outfit allowance £60. Free passages for the officer and his wife with assistance towards the cost of children's passages and their maintenance in this country. Candidates should have administrative ability and have had wide theoretical and practical experience of low frequency amplifiers and radio equipment. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/30482/RC. (872

LOCUST OFFICER (PART TIME RADIO DUTIES) required by the DESERT LOCUST CONTROL, EAST AFRICA HIGH COMMISSION for one tour of 12–36 months in the first instance. Salary scale (including inducement pay and a variable cost of living allowance according to posting) £772 rising to £1,476 a year with gratuity on termination of service. Outfit allowance £30. Free passages. Liberal leave on full salary. Candidates should have practical and preferably field experience of the maintenance and operation of low and medium power H.F. transmitter-receivers (currently American B.C.610 and British Redifon GR49 and army type 19 sets) and petrol electric generators. They should be capable of carrying out field repairs to such equipment under desert conditions. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters full qualifications and experience and quote M2C/41331/RC. (887

RADIO OFFICERS required for the POSTS AND TELEGRAPHS DEPARTMENT NIGERIAN FEDERAL GOVERNMENT for one tour of 12/24 months in the first instance. Candidates may be appointed (a) on agreement with prospect of permanent and pensionable employment in the salary scale (including expatriation pay) £750 rising to £1,284 a year or (b) on contract terms with salary scale (including expatriation pay) £810 rising to £1,386 a year with gratuity at the rate of £100/£150 a year. Outfit allowance up to £60. Free passages for officer and wife. Assistance towards cost of children's passages and assistance up to £150 a year for their maintenance in U.K. Liberal leave on full salary. Candidates must have recent experience in operating wireless and direction finding ground stations for air services, and possess a P.M.G. Certificate in radio telegraphy, an air operators certificate, or equivalent service qualification. They must also have a thorough grounding in I.C.A.O. codes and procedures. Write to the Crown Agents, 4 Mill-Bank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/41111/RC. (883

TECHNICAL ASSISTANTS of British Nationality with experience in the operation and maintenance of medium power M.F. or H.F. transmitters are required for the Forces Broadcasting Service in the Middle East and East Africa. City and Guilds certificates (or equivalents) an advantage. Duties include the operation of studio or transmitter equipment, carrying out minor repairs, balance and control of programmes, recording on either tape or disc, and installation of equipment for outside broadcasting work. Salary scale £400 to £600 per annum plus pay supplement of £43.10 at the minimum of the range rising to £55 at the maximum range according to age and experience plus a Foreign Service Allowance depending upon the station and whether the officer is married or single. Full details may be obtained at any Employment Exchange. Reference OMP.3042/55 Sheet No. 444, should be quoted. (881

COMMONWEALTH OF AUSTRALIA
PUBLIC SERVICE OF PAPUA & NEW GUINEA
VACANCIES—DEPT. OF POSTS & TELEGRAPHS

Senior Radio Telegraphist—£A1,088–£A1,148 per annum. (2 Vacancies)

Qualifications—First Class Certificate of Proficiency (P.M.G. Department, Australia, or British Post Office or equivalent); ability to transmit and receive Morse at 25 w.p.m. and touch type at 30 w.p.m.; two years commercial experience desirable.

Radio Telegraphist—£A945–£1,058 per annum. (4 Vacancies)

Qualifications—Second Class Certificate of Proficiency (P.M.G. Department, Australia, British Post Office or equivalent); ability to transmit and receive Morse at 20 w.p.m. and touch type at 30 w.p.m.; one year's commercial experience desirable.

GENERAL INFORMATION

Salary—Rates quoted include cost of living and Territorial allowance. Married officers receive an additional £100 per annum.

Eligibility—Adult male British subjects under 45 years.

Appointment—Permanent, subject to satisfactory probationary period.

Location—Appointees are required to serve anywhere in the Territory.

Accommodation—Single accommodation only available. Married accommodation unlikely to be available under eighteen months.

Separation Allowance—An allowance is payable at the discretion of the Territory Administration and it is designed to compensate for the added expense of married appointees obliged to maintain family outside the Territory.

Leave—Three months after each 21 months in Territory, additional three months after each six years service and six months furlough after 20 years service.

Taxation—Income derived by residents of the Territory, from sources within the Territory is not at present taxable under Commonwealth legislation.

Further Information and Application Forms—Information Handbooks on the Public Service of Papua and New Guinea and application forms are available from the Public Service Board Representative, c/o Australia House, Strand, London, W.C.2.

Applications—SUBMIT on prescribed form to: Public Service Board Representative, Strand, London, W.C.2, by 16th January, 1956.

Printed in Great Britain for the RADIO SOCIETY OF GREAT BRITAIN, New Ruskin House, Little Russell St., London, W.C.1, by The Haycock Press, Ltd., London, S.E.5

IF UNDELIVERED Return to:— R.S.G.B., NEW RUSKIN HOUSE, LITTLE RUSSELL STREET, W.C.1

IF UNDELIVERED Return to:— R.S.G.B., NEW RUSKIN HOUSE, LITTLE RUSSELL STREET, W.C.1