RSGB

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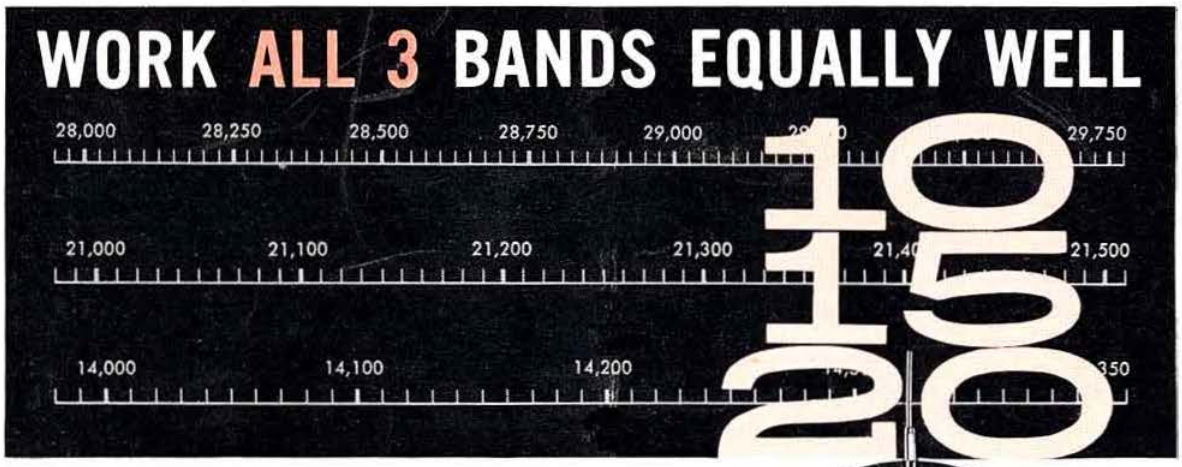
JANUARY, 1959

BULLETIN

2/6 Monthly

VOL. 34, NO. 7

WORK ALL 3 BANDS EQUALLY WELL



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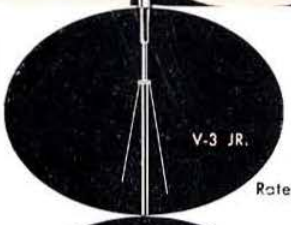
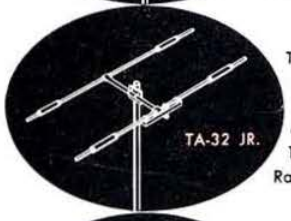


Vertical aerial. 10-15-20M. Rated to 300W.



Two-element rotary beam aerial. 10-15-20M. Rated to 300W.

Three-element rotary beam aerial. 10-15-20M. Rated to 300W.

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Yours sincerely,
A. T. Martin
G2LB

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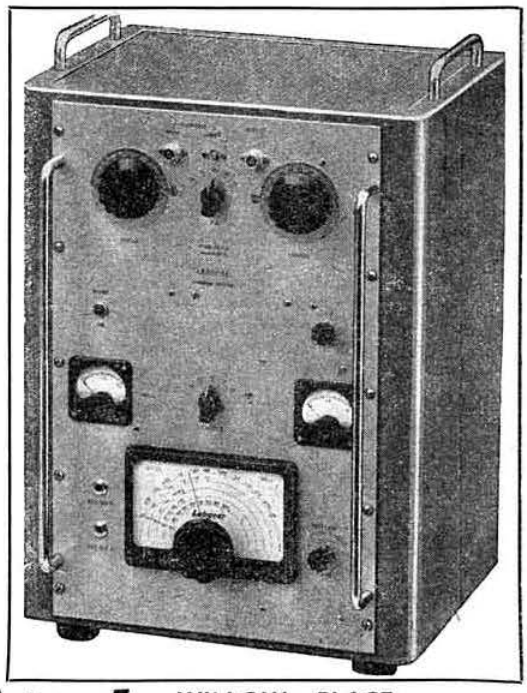

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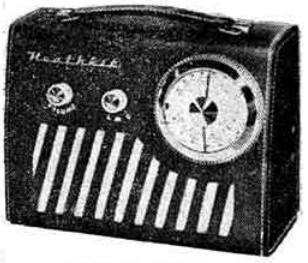

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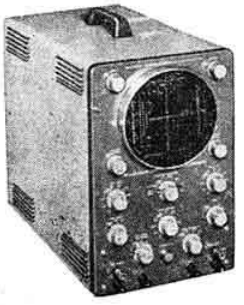

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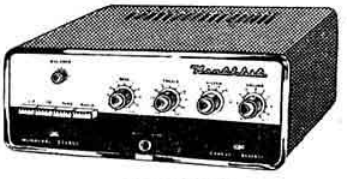

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Volume 34 No. 7
January 1959

R.S.G.B. BULLETIN

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Current Comment

discusses topics of the day

Top Band

FOR the second time in less than a year the Post Office has asked the Society to remind members who operate on Top Band to avoid the use of frequencies which are liable to cause harmful interference to the operation of radio telephone communication between ships and shore stations.

The current reminder, like the one published last March, has become necessary because of a complaint from Denmark that certain amateur stations in the United Kingdom are causing harmful interference to Skagen Radio on 1988 kc/s, which is one of several frequencies used by the Danish Marine service; others are 1806, 1813, 1834 and 1995 kc/s.

Those whose experience of Amateur Radio dates back to, or beyond, the time of the Atlantic City Radio Conference in 1947, will recollect that it was largely because the R.S.G.B. had representatives at the Conference that the Top Band was retained as an amateur allocation in the United Kingdom, albeit the retention was (and still is) of a somewhat " flimsy " character.

Prior to the Atlantic City Conference there had been no particular anxiety on the part of the R.S.G.B. that the Top Band (then 285 kc/s wide, from 1715 to 2000 kc/s) would come under attack, although it had been known for some time that other users of frequencies in that part of the spectrum were a little concerned at the somewhat childish pranks of certain amateurs who got up rather early in the morning! It was not, however, until the Conference had been in progress for several weeks that it became clear that a concerted effort was being made by several European delegations to prevent amateurs from retaining a hold in the band. It was at that stage that the leader of the United Kingdom delegation invited the Society's representatives (who were present at the Conference as I.A.R.U. observers) to begin the task of putting over the amateur viewpoint to those delegates, who were thought to be friendly towards the amateur movement. It had been anticipated, for example, that support would come from the Scandinavian group of countries but to the disappointment of those concerned in the negotiations from " our side of the house " it was this very group that lined itself up strongly against the continued use by amateurs of frequencies in the Top Band. As nations with considerable marine interests they argued that an amateur station operating with an input of no more than 10 watts could seriously interfere with ship-to-shore services.

When it was seen that the majority of administrations in Region I would oppose a continuation of a reference to the Amateur Service in that part of the Frequency Allocation Table between 1715 and 2000 kc/s, a representative of the United Kingdom delegation, who was also the Chairman of the all-important Frequency Sub-Committee, suggested to the R.S.G.B. observers that they should endeavour to persuade certain Region I delegations to associate themselves with a U.K. proposal that would permit their respective Governments to allocate up to 200 kc/s to the Amateur Service between 1715 and 2000 kc/s on the understanding that no harmful interference would be caused to the services authorized to use those frequencies.

By great good fortune the delegations of Austria, Ireland, the Netherlands, Northern Rhodesia, Southern Rhodesia, Switzerland and the Union of South Africa found themselves able to accept the U.K. proposal, with the result that a special footnote to cover the point was added to the Frequency Table.

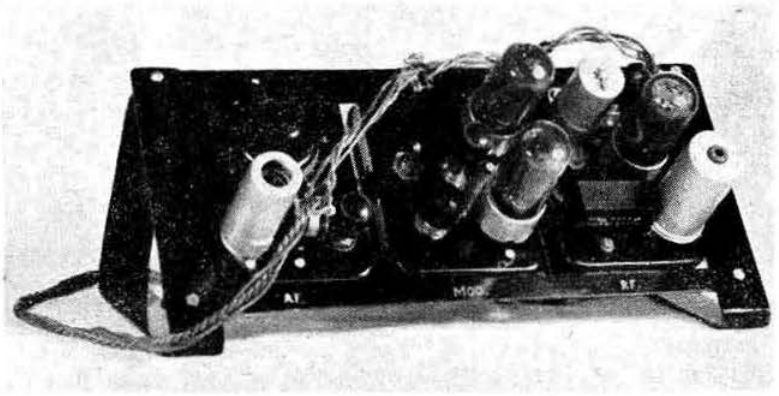
" Tea cupping " has been played down at recent I.A.R.U. Region I Conferences but if it had not been for " tea cupping " in Atlantic City it is doubtful whether the Top Band would still be available to amateurs in the United Kingdom.

Without belabouring the point it should be abundantly clear to even the most recently licensed amateur that the position on Top Band, in so far as the Amateur Service in Europe is concerned, is considerably more tricky than it was eleven years ago. With the Geneva Radio Conference only seven months away, those who work on that band would do well to take heed of the friendly reminder given by the G.P.O. It would indeed be a tragedy if the selfish behaviour of a few irresponsible amateurs led to the curtailment of our present Top Band facilities.

From an R.S.G.B. point of view it is unfortunate that very few of the other National Societies in Region I seem to be interested in Top Band operation. Why this should be so has never been made very clear at I.A.R.U. Conferences but it probably stems from the fact that, in most European countries, those responsible for radio communications fear that vital marine services would be adversely affected if frequencies between 1·8 and 2 Mc/s were also used extensively by amateur stations. Whatever the reason the fact remains that at the present time Top Band activity in Europe is almost negligible, although it is a pleasing sign to note that the West German Government has recently authorized limited operation in that band. We should feel a lot happier, however, if we knew that every National Society in Region I was pledged to press its Administration to support at Geneva a proposal that Top Band shall continue to be used by amateurs on the same basis as at present. J. C.

A Short Wave Receiver Calibrator

By J. G. WILKES, B.Sc., A.R.I.C. (B.R.S.21242)*



A view of the calibrator showing (left to right) the audio oscillator, modulator and crystal oscillator.

FOR many people an interest in Amateur Radio gradually develops as a result of listening to short wave signals on an ordinary broadcast receiver, in fact this is one of the best ways of taking up the hobby. Thus, quite commonly, the " first " receiver is either an ordinary broadcast set, possibly modified for better short wave coverage, or alternatively a home built novice affair such as described in the R.S.G.B. booklet *A Guide to Amateur Radio*. Since such a set is generally not fitted with a beat frequency oscillator the usual unmodulated crystal marker oscillator is not suitable for calibration purposes; the stronger harmonics will be detected by the reduction in noise level as the carrier is tuned in, but weaker harmonics will be lost. Further, the usual type of b.f.o. is made to operate via the i.f. stages of a superhet and is inapplicable to t.r.f. receivers. Finally, if the set aerial is left connected when using the normal unmodulated crystal marker generators, spurious marker points can arise from various foreign and commercial stations which, when on standby, radiate their carriers only for quite long periods. A modulated calibration signal would obviously have many applications and therefore the receiver calibrator here described, has been designed to give an output consisting of pulses of harmonics from a quartz crystal oscillator, the pulse repetition frequency being chosen so that a convenient audio note is obtained after rectification of the signal in the detector stage of the receiver under examination. This calibrator is therefore suitable for use with any kind of set, t.r.f. or superhet, with or without a b.f.o.

* *25 Cedar Drive, Hatch End, Middlesex.*

General Layout

The design, a block diagram of which is shown in Fig. 1, is quite flexible with regard to operating conditions. The high and low frequencies chosen were 500 kc/s and 500 c/s respectively, but these are very much a matter of personal preference dependent upon the range of interest. Thus a 500 kc/s marker only gives one check point in Top Band (at 2·0 Mc/s) but five check points in the 10m band between 28 and 30 Mc/s.

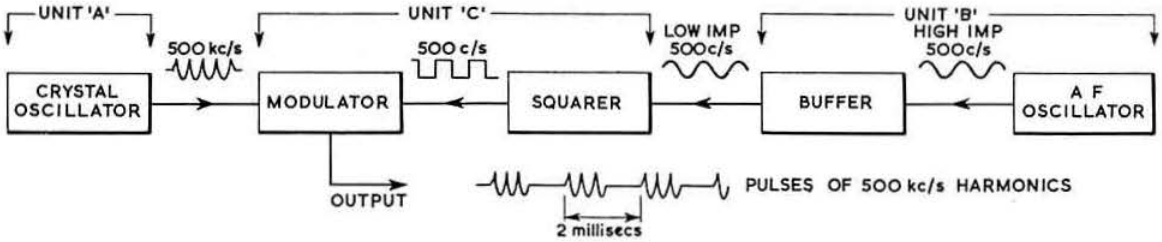


Fig. 1. Block diagram of the calibrator.

The calibrator was built in three sub-units:

(*a*) A 500 kc/s quartz crystal oscillator and harmonic generator.

(*b*) A phase shift audio oscillator with circuit values chosen to give an optimum output at about 500 c/s but variable between 400 and 600 c/s, with cathode follower output.

(*c*) An overdriven amplifier to convert sine to square wave together with a Haas modulator.

Pulses were preferred to sine wave modulation since the rather harsh note obtained is very clearly distinguished against any other heterodynes that may be heard.

These three sub-units were each separately built on to small chassis (2 oz. tobacco tins are ideal for this purpose), which were then bolted together into a framework made from odd pieces of angle and strip aluminium. Using this method of construction each of the sub-units is immediately available for any other application that may arise; in this respect the a.f. source has proved to be particularly useful. The photograph shows the final appearance of the completed equipment after painting with black cellulose.

The complete circuit is shown in Fig. 2.

The Crystal Oscillator and Harmonic Generator (Unit "A")

The circuit used for Unit A was first described by F. Butler [1, 2] and has formed the basis of at least one commercial crystal oscillator [3]. It consists basically of a multivibrator type circuit in which one coupling (taken between the cathodes) is via the crystal, which then acts as a series resonator presenting a high impedance to all frequencies except that for which it was designed. The other coupling is from anode 1 to grid 2 and here the anode load is a parallel L-C combination tuned to the crystal frequency.

The output is taken from anode 2 which has as a load a germanium diode (CR1), the most suitable type being one possessing a high ratio of forward/reverse current which then gives an output waveform that is extremely "peaky" and contains very high harmonics of the basic crystal frequency. It has been found [1] that low activity crystals which have given a poor performance when used as parallel resonators operate satisfactorily in this circuit so no difficulty should be encountered in getting the unit to oscillate. For the tuned circuit an old air cored long wave coil with a 4–40 pF trimmer soldered directly across the coil lugs was found to tune to 500 kc/s (600m); only the coil used was left on the former—the others were all stripped off.

A rough check on the suitability of a chosen coil and trimmer, using only a broadcast receiver, may be made as follows:

Tune the receiver to a weak station at the low frequency end of the medium waveband (around 520–550m) and place the tuned circuit in the aerial lead close to the set input terminal. By adjusting the trimmer the L–C circuit acts as a wavetrap and it should be possible either completely to tune out the station being received or at least to obtain a definite signal minimum. If the components used are to be correct at 600m the setting required to tune out the chosen station should be such that the trimmer is not completely screwed down.

After construction the only setting required is to adjust the trimmer so that the L–C circuit is tuned to 500 kc/s; indication of this may be obtained in two ways. Firstly, by measuring the current at point "X" (see Fig. 2) it will be found that the current increases and peaks sharply when oscillation starts. Values found for a particular unit were 7 mA and 11 mA respectively. The other method may be used if a suitable milliammeter is not available. Temporarily clip a 33 K ohms 2 watt resistor from the point "X" to chassis and then supply the current to the sub-unit at this point through a 6 volt 0·03 amp. torch bulb. Due to the added shunt resistance the current taken by the sub-unit is increased and the bulb filament should just glow a very dull red. When the tuned circuit is now correctly adjusted, the further increase in current taken will be shown by a marked brightening of the filament. It is essential to use a low current rating bulb in order that the brilliance change be as large as possible and this depends on the ratio tuned/untuned current. Using the components as quoted above, the actual currents measured were 14 mA and, on tuning, 18 mA, i.e. a 22 per cent. change.

As indicated in Fig. 2, the tuned circuit needs a screening can to avoid the effects of stray capacitance; the tuning operation described above should be carried out with the screening can on. However, as the trimmer has the full h.t. voltage on it, a rubber grommet must be fitted in the hole in this screen so that shorting does not occur when a screwdriver is inserted to adjust the tuning.

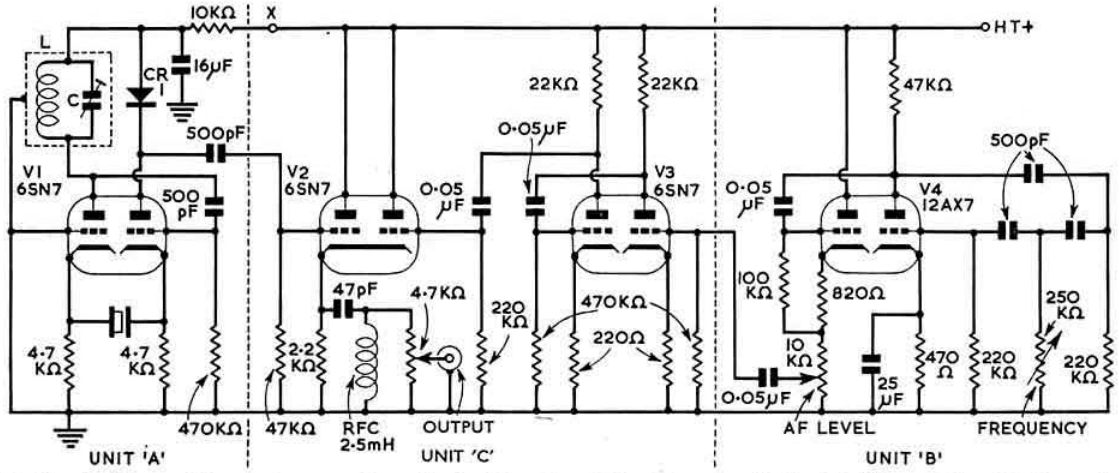


Fig. 2. Circuit diagram of the short wave receiver calibrator. The values of C and L are given in the text. The crystal used by the author in Unit A was ground for 500 kc/s. The r.f. choke in Unit C is an Eddystone type 737 (2·5 mH). Note: In this diagram the output socket should be marked "Modulated Output."

The Audio Oscillator and Buffer (Unit "B")

An audio oscillator of the phase shift type was chosen as it gives a good output waveform, a high output voltage and is very compact. In this circuit an RC feedback network is introduced between anode and grid which at the operating frequency gives rise to 180° phase shift. Thus the feedback is positive and, provided that the valve gain is sufficient to compensate for the attenuation of the feedback loop, oscillation is maintained [4]. Since a single resistor and capacitor give less than 90° phase shift, three stages are required for 180° phase shift and the voltage amplification required is 29.

The frequency at which the phase shift is 180° is given by:—

$$f_o = \frac{1}{15{\cdot}4 \times C \times R} \qquad (C \text{ in farads; } R \text{ in ohms})$$

so for values of 500 pF and 220 K ohms the operating frequency works out at about 500 c/s; by making one of the resistors a ¼ Megohm variable the range 400–600 c/s is covered. For this type of oscillator it is desirable to choose a valve having a high amplification factor and for this reason a pentode is commonly used; however, in this case a double triode was preferred so that one half could be used for the oscillator and the other half for a buffer cathode follower. Attempts to use a 6SN7, with amplifica-

tion factor 20, were not successful; but the more modern, B9A based, 12AX7, which has an amplification factor of 100, was found to give a very good performance. No comment is required regarding the cathode follower output which is quite conventional.

The Squarer/Modulator (Unit " C ")

The sine-to-square wave conversion is obtained by an overdriven amplifier. Since the aim here is merely to obtain a switching voltage to operate the modulator no attempt has been made to achieve an exactly square wave resulting in equal on/off periods. Using the very simple double triode circuit shown with its two sections operated in cascade the actual on/off ratio depends upon the amount of drive supplied by the a.f. source.

The description of the modulator has been left deliberately until last. A consideration of the properties expected of it quickly reveals a rather awkward specification. Firstly, it must be capable of passing the crystal oscillator harmonics well up into the megacycle frequency range without serious attenuation. Secondly, it must not load appreciably the crystal oscillator and so interfere with its working, thus implying a high input impedance. Thirdly, it should be untuned and preferably supply an output at low impedance. Thus when this pulsed calibrator was first considered it was thought that the most difficult part would be the modulator, but in the event a very simple answer to the problem was found.

The type of modulator chosen is due to A. Haas [5, 6] and as can be seen from Fig. 2, it consists of a double triode, cathode follower connected, with the two cathodes strapped together; the r.f. is taken to one grid and the a.f. to the other. The modulated output appears across the cathode load together with unwanted a.f. which is heavily attenuated by the capacitor/r.f. choke filter.

This circuit has several very useful features which it is well worth listing:

(*a*) Operating as a cathode follower its frequency range is extended well into the high megacycle range.
(*b*) It presents a very high input impedance to both r.f. and a.f. signals.
(*c*) There is no Miller effect and therefore the oscillators cannot be detuned by the modulator.
(*d*) It needs very few components none of which are critical and the applied voltage can vary considerably without upsetting its working.
(*e*) It has a low output impedance.

Following Haas, the whole of the cathode load is employed to provide the grid bias voltage, thus the value of cathode resistor chosen is a compromise between working point on the valve characteristic and output available. In any case the output is more than adequate and some control is needed so a preferred value 4·7 K ohms potentiometer is fitted.

Performance and Uses

The calibration procedure is quite straightforward: first switch on both the receiver and calibrator and leave for about 15 minutes to warm up, then attach a short piece of wire to the calibrator output terminal and run it near to the receiver aerial; this provides sufficient coupling.

As the set is tuned in the modulated harmonics are heard coming in one after another across the band but which is which? This problem is solved if a known short-wave station operating near to a harmonic can be identified, thus providing a reference point. The commonest s.w. band fitted to broadcast receivers is 16–50m (18·75–6 Mc/s) and about the best station in this band is the easily identified Radio Luxembourg on 6·090 Mc/s, conveniently near to one end of the band and also to the 6·0 Mc/s harmonic of a 500 kc/s crystal. Once one point has been fixed then by slow tuning, so that no harmonic is missed, the remainder of the band may be calibrated.

One warning is needed with respect to the calibration of superhet receivers; that is to keep the calibrator output level as low as possible to avoid spurious points arising in the case of a receiver with too wide a band width in the first stage. A simple example illustrates how these arise:—

For a set with 465 kc/s i.f.: if the two points tuned are:
17·000 Mc/s (local oscillator frequency 17·465 Mc/s)
16·070 Mc/s (local oscillator frequency 16·535 Mc/s)
then a 17·000 Mc/s signal could beat with the local oscillator in either case to produce a 465 kc/s i.f. output, so if the bandwidth when tuned to 16·070 Mc/s is too wide the 17 Mc/s harmonic can get through and give a spurious point. The answer, as stated above, is to keep the calibrator output low; also if a frequency versus dial reading graph is plotted a " phoney " will stand out from the other points.

The main purpose in drawing attention to this point has been to stress that the calibration of a receiver while easy to carry out must be done carefully if mistakes are to be avoided.

A calibrator built to the above specification has been used to check several broadcast sets and a C.R.100 communications receiver up to 30 Mc/s.

To see just how high the harmonics went an 80–100 Mc/s f.m. tuner was fitted with an a.m. detector and the calibrator " short piece of wire " output was run close to the tuner input, no matching being attempted. Rather surprisingly it was found that although weak the modulated harmonics were still clearly tunable, that is at around the 200th harmonic.

The power requirements for this calibrator are quite small—30 mA at 250 volts h.t. and 2 amps. at 6·3 volts for the heaters which may be obtained from the set under test or a separate bench power pack.

References

[1] " Series Resonant Crystal Oscillators," F. Butler, *Wireless Engineer*, June 1946, p. 157.
[2] " Cathode Coupled Oscillators," F. Butler, *Wireless Engineer*, November 1944, p. 521.
[3] General Radio Type 1213A Unit Crystal Oscillator. (See also *Radio Laboratory Handbook*, by M. G. Scroggie, Iliffe.)
[4] " Phase Shift Oscillator," W. C. Vaughan. *Wireless Engineer*, December 1949, p. 391.
[5] A. Haas, *Toute la Radio*, October 1948.
[6] *The Oscilloscope at Work*, Haas and Hallows, Iliffe 1954. (Chapter on modulators.)

London and Home Counties Mobile Group

THE inaugural meeting of the London and Home Counties Mobile Group will be held at the " Rising Sun," 46 Tottenham Court Road, London, W.1, on Sunday, February 22, commencing at 4 p.m. The venue is near Bedford Square where there is ample parking space.

All members interested in mobile operation are invited to attend.

LONDON U.H.F. GROUP ANNUAL DINNER

Bedford Corner Hotel, Bayley Street, Tottenham Court Road.

Saturday, January 31, 1959, at 7 p.m.

All v.h.f. and u.h.f. enthusiasts welcome.

Tickets, price 12/6 each, may be obtained from P.A. Thorogood (G4KD), 35 Gibbs Green, Edgware, Middlesex.

Design of Single and Twin Paddle Control Levers for Electronic Keyers

By D. P. L. MAY (G2BB)*

ALTHOUGH many different types of electronic keyer circuits for Morse code transmission have been designed and published, virtually no serious attention appears to have been paid to the design of electronic keyer manual control levers. This omission seems strange when it is remembered that, in fact, the controlling lever is just as important a part of the keying system as the circuitry and relays.

The advent of the electronic keyer has resulted in a very noticeable increase in operating speeds. Twenty five words per minute is about top speed for the average operator using a " straight " key. A " bug " key may, perhaps, increase his speed to 28 words per minute, but the same operator will be capable of sending at well over 30 words per minute with an electronic keyer. In addition he will produce better Morse at the higher speed with less effort than before.

Operators interested in even faster work can, given the right conditions, achieve speeds in excess of 40 words per minute by using a good electronic keyer. The main limitation is, in this case, usually to be found in the manual control lever. If the apparatus is satisfactory the ultimate achievable speed is dependent, firstly, upon the speed of conscious to sub-conscious translation and, secondly, on the physical reflex speed and accuracy demanded of the sending hand.

Since an electronic keyer requires fewer manipulative movements per word than a " straight " key, it follows that, for a given number of manipulations per minute, its keyed " output " speed will be greater. At his maximum speed, the electronic keyer operator is manipulating at a rate comparable to his manipulative maximum with the "straight" key. In addition, because the Morse output speed is higher, he has to concentrate to a greater extent upon his Morse than when manipulating the " straight " key. It becomes apparent, therefore, that the construction of the electronic keyer control lever is of great importance in achieving the final result, in that the operator must have a control lever which will not only respond instantly and accurately to his manipulations, but which will not cause unwanted characters to be sent upon fast manual release of the lever.

* " *Roza*," *Reading Road, Yateley, near Camberley, Surrey.*

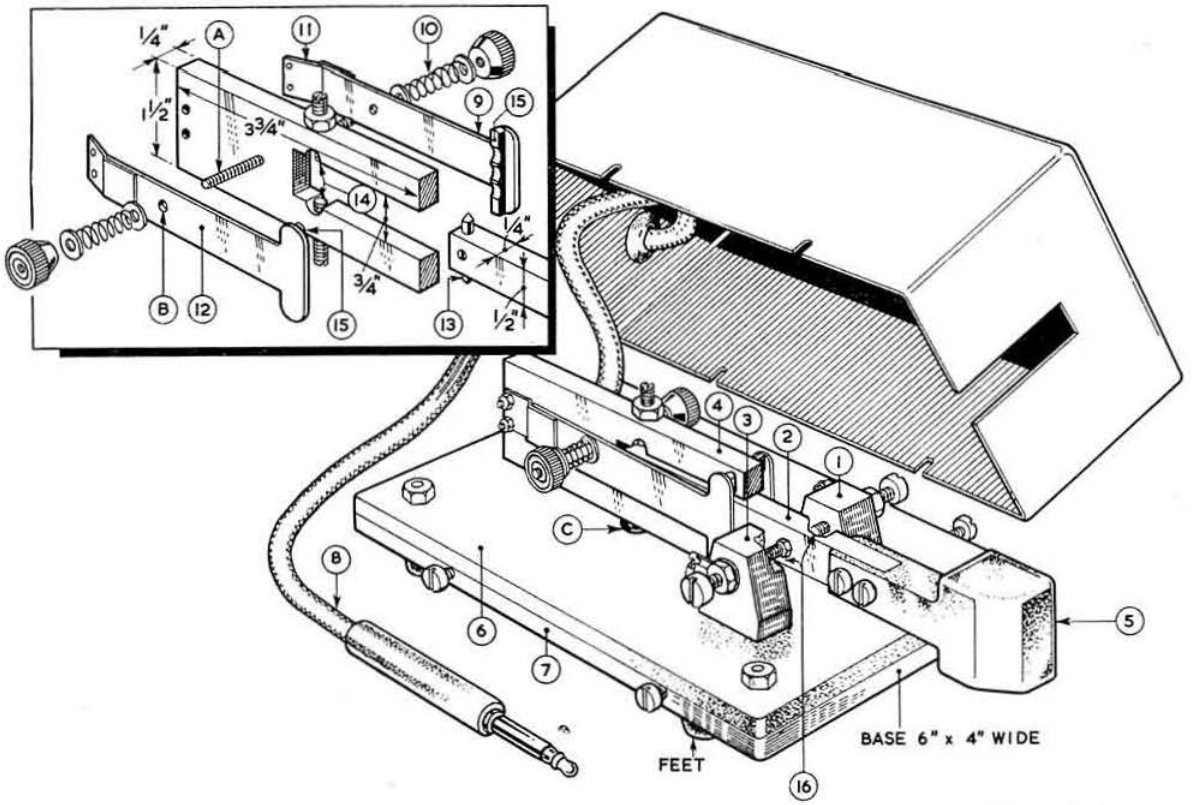


Fig. 1. A single paddle control lever designed by VQ4GP. The key to the various numbered and lettered parts is as follows: 1—dot contact pillar connected to plug tip; 2—moving arm connected to sleeve of plug; 3—dash contact pillar connected to ring of plug; 4—moving arm bearing carriage; 5—control knob (insulating material); 6—base (insulating material); 7—sub-base (to add weight, material brass); 8—three-core cable; 9—dot return lever; 10—dot pressure adjuster; 11—dot residual pressure spring; 12—dash return lever; 13—hardened steel pivot; 14—hardened steel pivot bearings threaded into bearing carriage; 15—return lever faces; 16—rhodium flashed contacts (two pairs); A—studding threaded into bearing carriage; B—clearance hole for A; C—clearance hole through 6 and 7 (to clear 14).

The Requirements of a Control Lever

The requirements for a good keyer control lever are positive contact action, low resistance contacts, perfect bearing for the moving arm, a good " feel " and, above all, freedom from " overshoot." Overshoot of the moving arm on to the opposite contact upon release results in the sending of an unwanted character and is a common fault with existing levers. Some form of damping for the moving arm is necessary to prevent code errors from this cause, but it is essential that this damping should have no effect on the normal movement of the arm which must be free and very positive in action.

Fig. 1 illustrates a single paddle key lever to a registered design by Peter Hayes (VQ4GP, ex-G3IXV) which fulfills those requirements very satisfactorily. The drawing has been arranged to be as self-explanatory as possible. The moving arm (2) is mounted on pivot bearings (14) by means of the pivot (13). The " U " section lever carriage must be the same thickness as the moving arm so that the dot and dash return lever faces (15) register exactly at the upper face of the carriage, the side of the arm and the lower face of the carriage, on their respective sides, simultaneously, when the moving arm is at rest. A return lever lifts readily when the moving arm is pressed in the direction of that lever. When released, the arm is returned immediately to the neutral position by the spring (10) or (11) but does not overshoot because of the presence of the " dead " return lever which is guarding the opposite contact. The hole (B) in the return levers must be large enough to ensure free movement of the lever.

Twin Paddle Design

As a result of investigations into the design of complex types of electronic keyers, involving computer techniques, the writer has registered his design of a twin paddle control lever which is shown in Fig. 2. This lever may be the easier to make if one has limited workshop facilities and, moreover, it offers certain advantages over the single paddle type when used with some of the simple types of keyer.

The twin paddle lever is essentially a single pole change-over switch, but the control arm contact can, by squeezing the paddles together, connect to the dot or dash contacts in a shorter space of time than that required to change a single lever key from one side to the other. With most types of simple keyer the loss of a dot, due to faulty timing on the operator's part, sometimes occurs. This is due to the dot being " demanded " before the keyer has completed the previously sent dash. During the marking period, most of these keyers automatically disconnect the manual control lever from the circuit. Thus, if a dot is demanded before completion of the dash the keyer ignores the demand. (The

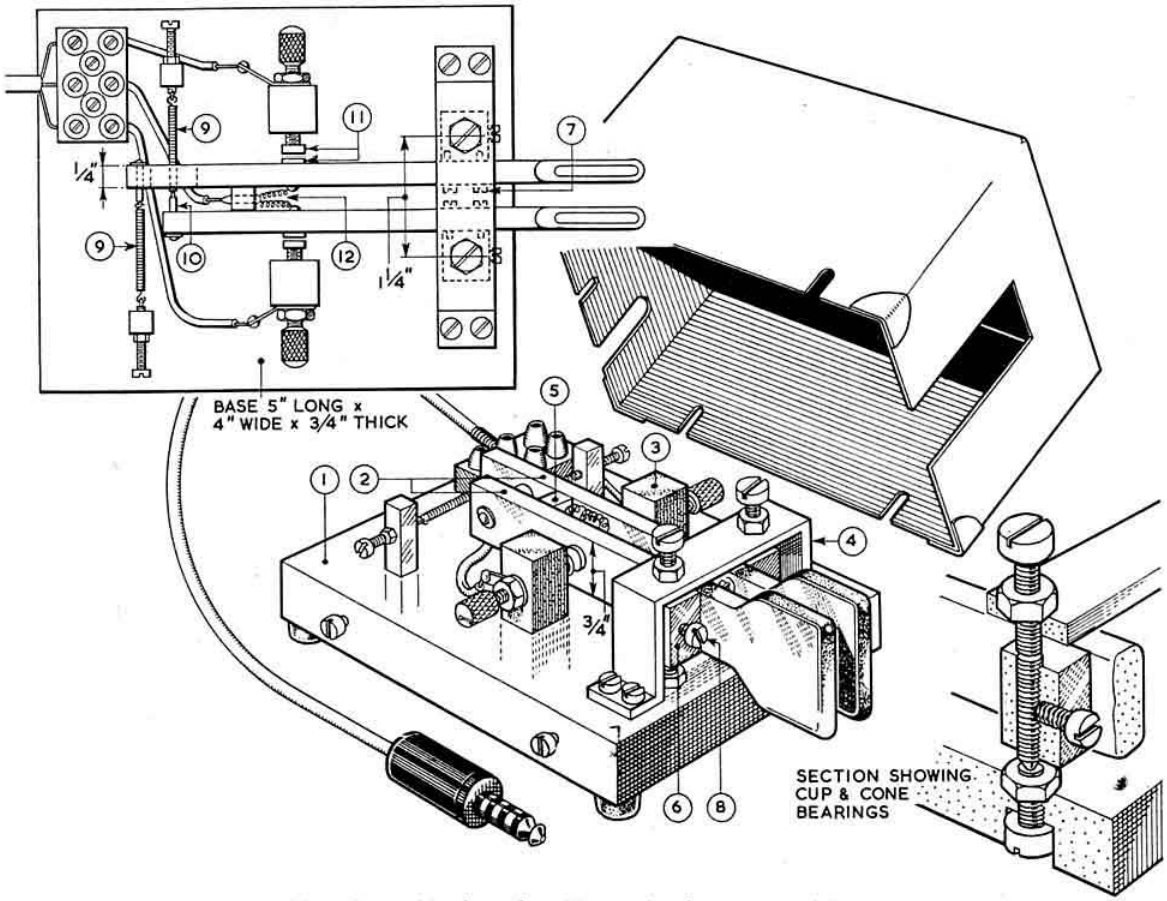


Fig. 2. The double paddle control lever designed by the author. The numbered parts are as follows: 1—heavy metal base; 2—dot and dash levers (bakelized fabric); 3—dot and dash contact pillars (bakelized fabric); 4—upper pivot bearing carriage (brass); 5—lever stop post; 6—pivot shaft carriage (brass); 7—pivot shaft carriage screws securing carriage to levers; 8—pivot shaft locking screw, locking shaft in carriage; 9—lever tension spring, 32 s.w.g. piano wire, 30 grammes tension; 10—spring anchorage rivet, loose fit in lever; 11—contacts (rhodium flashed); 12—connecting pigtails (Litz 9/36 or similarly flexible wire).

same is true of dot-to-dash sequence, but, due to the relative character lengths, the operator has less trouble in making correct spacing.) With the twin paddle lever a form of mechanical memory is provided since, immediately a character has been started, the opposite lever can be pressed and held until the next wanted character starts. The first lever has to be released before the first character has finished in order to produce the wanted sequence of characters. A simple modification to this type of keyer would improve this " memory " still further, e.g. the dot lever could be made to operate a circuit disconnecting the dash generating circuit from the dash lever. By this means a dot demanded following a dash would over-ride the dash lever's potential demand for further dashes and free the operator of the onus of releasing the dash lever at or before the completion of the dash.

The twin paddle lever can, in any case, be manipulated as if it were a single paddle lever by pressing the dot lever for dots and the dash lever for dashes without overlap.

It can be seen that, for a given contact gap, the changeover movement dot-dash, dash-dot required by " mark " demand is only half in the case of the twin paddle compared with the single paddle type. Lever transit time is reduced by this amount, thus easing the manual control problem since the " release " of a lever is automatic and not related to a following " mark " of opposite character.

Constructional Notes

Fig. 2 illustrates the writer's proved design for the twin paddle control lever. The paddles are made of bakelized fabric, which is easy to cut and file to shape. Similar material is used for the fixed contact mounting blocks. Approximate sizes are given for scaling purposes.

The paddles are mounted by means of pivot bearings, the shafts being pressed through a hole in the pivot shaft carriage (6) and locked by means of the screw (8). The moving contact take-off wires are anchored to the lever stop post (5) by means of a lead-through wire which is a tight fit in the post. The dash lever (right hand side) has a large clearance hole to allow the dot lever tension spring (9) to pass through it.

The moving contacts may be attached to the levers by riveting but must be firmly anchored to the lever.

During trials with both key levers extending over two years, trouble with keyers " running on " was experienced. This was caused by minute particles of contact material bridging the contact gap. Many different types of contact material were tried before the final solution was found to be in the use of rhodium flashed contacts. Perhaps this fault may not be troublesome in many cases. The author is very heavy handed so that the contacts, in his case, have a rough time. Even though the working gap used is only about two thousandths of an inch, particles of metal were being torn from the contacts. Rhodium flashed contacts, however, last indefinitely and never require cleaning.

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A Rear End for Portable Receivers

By T. H. HOLBERT (G3DXJ)*

THE design and construction of really portable gear involves careful consideration of a number of problems. Compactness, adequate sensitivity, selectivity and stability are objects not easily attained. One particularly thorny problem is provision of a b.f.o. for netting and reception of c.w. signals.

The conventional arrangement with separate b.f.o. entails an additional valve, tuned circuit and controls. Likewise the usual diode detector heavily loads the final i.f. tuned circuit with consequent loss of selectivity. Other compromise circuits such as the regenerative leaky grid detector, or regenerative i.f. stage overload easily on strong signals and seldom have reasonable frequency stability or smooth control.

The circuit shown in Fig. 1 is a compromise, but offers certain advantages not found in more orthodox designs.

It will be seen that the detector and b.f.o. are combined in a single stage, and that by using a twin triode, the whole rear end of the receiver can be accommodated in one valve, with a worthwhile saving of components. C1 and C2 replace the original capacitor across the last i.f. tuned circuit and each should be twice the value of that component. The infinite impedance type detector gives a useful increase of selectivity by lightly loading the tuned circuit. Further selectivity on phone can be obtained by advancing the regeneration control R1 to the threshold of oscillation. On advancing R1 further, oscillation at the i.f. commences and beat notes are produced from incoming signals. The audio is then passed to the second triode which is a straightforward a.f. amplifier. Ample output for headphones is available. Stability of the b.f.o. is unusually good.

The i.f. stages of the receiver should be aligned in the usual way with the b.f.o. turned off. Then, with an unmodulated carrier at the i.f., the b.f.o. should be turned on and the dust core or trimmer adjusted for oscillation at the i.f.

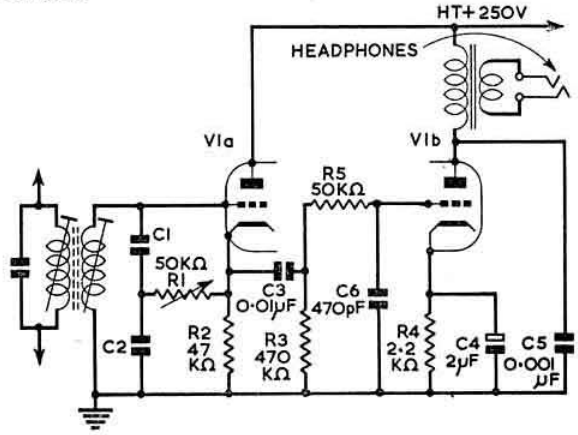


Fig. 1. Circuit diagram of the compact receiver rear end. V1 is a 12AU7 or 6SN7. C1 and C2 are each twice the value of the original capacitor across the final i.f. tuned circuit.

While the superhet receiver has been considered throughout, there is no reason why the circuit should not be applied to the detector/a.f. stage of a portable t.r.f. receiver, though the value of C1 and C2 will have to be not greater than 100pF above 7 Mc/s. In either receiver the circuit gives better sensitivity and selectivity, while freedom from overloading and smoothness of control are all that can be desired.

* *52b, Valon Road, Arborfield, Reading, Berks.*

London Meeting

Friday, February 27, 1959

" Recent Developments in the Microwave Field "

by K. W. Drummond (Mullard Ltd.)

at the

Institution of Electrical Engineers
Savoy Place, Victoria Embankment

Buffet Tea 6 p.m. **Lecture 6.30 p.m.**

The Short Loaded Aerial

By J. W. HILL, B.Sc., Grad.Brit.I.R.E. (G3JIP)*
and D. WHITE (G3JKA)†

THE purpose of this article is to attempt to provide an explanation of the operation of aerials of the type used in most mobile installations on the 160 and 80 metre bands (i.e. aerials which are short compared with the wavelength and are inductively loaded). Certain conclusions are drawn regarding the optimum practical proportions of such a system.

Consider an aerial of the form shown in Fig. 1.

The top section may be considered to have a capacitance (C_T) to space. This capacitance in conjunction with the

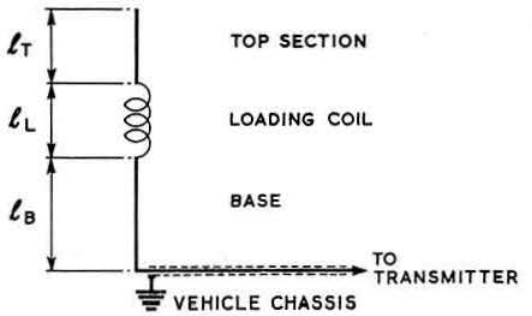


Fig. 1. Basic loaded mobile aerial.

loading coil inductance (L) forms a series resonant circuit. If this resonance occurs at the transmitted frequency the impedance at the base is small and resistive and hence a high current will flow in the base section of the aerial. Since the return path for the current is via a capacitance to space (effectively earth) and thence back to the car body any losses in this return path must be added in series with the base impedance to determine the feed impedance of the system. Since the earth is, in general, not a good conductor these losses will be appreciable when compared with the

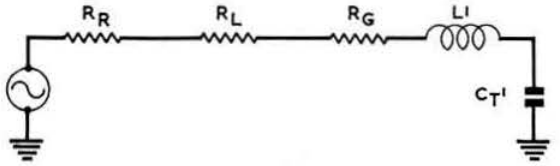


Fig. 2. Equivalent circuit of the aerial shown in Fig. 1, where R_R = radiation resistance of the aerial; R_L = equivalent coil loss resistance; R_G = equivalent earth loss resistance; L' = effective loading inductance and C_T' = effective tuning capacity.

base impedance of the aerial. Thus it can be shown (vide Appendix (2)), that the equivalent circuit of the aerial can be reduced to Fig. 2.

It can also be shown (vide Appendix (2)) that the radiation efficiency of this system is

$$\eta = \frac{40\pi^3 V C_T'^2 Q\,(4l_B^2 + 4l_L^2 + l_T^2)}{40\pi^3 V C_T'^2 Q\,(4l_B^2 + 4l_L^2 + l_T^2) + \lambda^3 + 2\pi V C_T'^2 Q\,\lambda^2 R_G}$$

* 68 King's Road, Walton-on-Thames, Surrey.
† 31 St. James Road, Kingston-on-Thames, Surrey.

G3JXA/M using an aerial of the type discussed in the article. The tuning capacitor is visible at the top of the loading coil.

For aerials of practical form this can be reduced to

$$\eta \simeq \frac{40\pi^3 V C_T'^2 Q\,(4l_B^2 + 4l_L^2 + l_T^2)}{\lambda^2(\lambda + 2\pi V C_T'^2 Q R_G)}$$

which for constant transmitted frequency, aerial dimensions, and earth loss resistance reduces further to

$$\eta \simeq \frac{AC_T'^2 Q}{B + DC_T'^2 Q}$$ where A, B, D are constants.

This tends to a maximum value of A/D as C_T' and Q tend to infinity. For aerials of normal dimensions operating on the 160 metre band this maximum value of efficiency is of the order of 0·5 per cent. As the frequency of transmission is increased the efficiency rises rapidly.

Practical Considerations

From the above it can be seen that the product of C_T' and Q should be as high as possible. Secondly, since the radiation resistance is proportional to $(4l_B^2 + 4l_L^2 + l^2_T)$, if the aerial is of fixed total height it is desirable that l_L and l_T should be a minimum (from Appendix (1) it can be seen that the coefficient of l_L is in practice less than 4). However, $C_T' \simeq C_T$ and C_T is approximately proportional to l_T. Hence the two requirements would appear to conflict. But a high C_T can be achieved by other means than a long top section. These methods include the use of capacity "hats" of various shapes (viz Appendix (1)).

Thus the ideal configuration would be as in Fig. 3. The capacity hat should be as large as possible (consistent with safety!). The coil should be of as high Q and low self-capacity as is possible. This latter requirement will usually imply a short coil (Ref. (2)).

A practical example of this form of aerial is as follows:

The height of the aerial was to be limited to 10 ft. The largest diameter of capacity hat considered safe was 24 in. This gives a capacity of about 22 pF which in itself was considered insufficient and therefore a vertical rod made

from 16 s.w.g. piano wire was added. This gave an added capacity of about 8 pF making a total capacity of 30 pF. Assuming a coil self capacity of about 5 pF it was calculated that an inductance of approximately 180 μH would be required. A coil of this inductance was wound on a 2 in. diameter polystyrene former with a winding length of about 6 in. The measured self capacity of the coil was 4·5 pF. It is not generally practicable to measure the Q of such a coil at the operating frequency using conventional Q meters. This

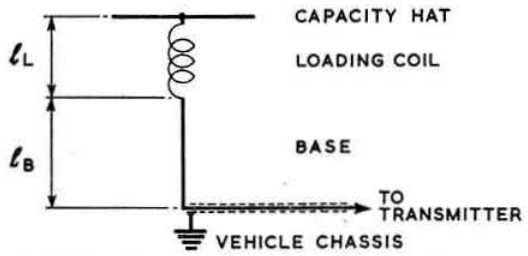


Fig. 3. Ideal configuration for a mobile aerial with capacity hat.

coil was checked on such a Q meter at 1·5 Mc/s where its Q was found to be approximately 200, rising slightly with frequency. Allowing 1 ft. for the coil and its mounting this gave a maximum base length of 6 ft. With these constants this gave a calculated efficiency of 0·4 per cent.

One disadvantage of a capacity hat is that tuning of the aerial is more than usually difficult. A means by which this difficulty may be minimized was devised for use with the above aerial. This consisted simply of inserting a small variable capacitor in series between the coil and the top capacity. The range of variation must be limited because if this variable capacitor is reduced too far in value the efficiency will be considerably reduced.

The range required will depend upon the aerial with which it is used but it will be approximately 50 pF to 150 pF.

Conclusions

Experiments have shown that predictions made from this general theory can be relied upon to give a satisfactory guide for further work. It is suggested that much more care in the design and manufacture of loading coils would materially increase their Q and reduce their self-capacity with a consequent radiation efficiency. A possible method of achieving this may be found in the use of ferro-magnetic core materials. The possibility of further increasing the top capacity, in addition to the use of capacity " hats," may

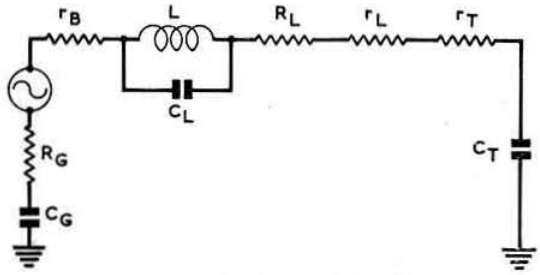


Fig. 4. Equivalent circuit of a short loaded aerial of the type used in amateur mobile installations. R_G = equivalent earth loss resistance; R_L = equivalent coil loss resistance; r_B = radiation resistance of the base section of the aerial; r_L = radiation resistance of the loading coil; r_T = radiation resistance of the top section of the aerial; C_G = capacity of the vehicle to earth; C_L = equivalent shunt capacity of the coil; C_T = the capacity of the top of the aerial to earth and L = the inductance of the loading coil.

be found in the use of conducting guy wires to the top of the coil (such guying can be recommended also on the grounds of safety). It is also obvious that if the ground loss resistance can be reduced a very considerable increase in possible efficiency may be obtained. Such a reduction is not normally possible; however many mobile operators will have noticed the rise in signal levels when driving on bridges over rivers or marshy land.

Acknowledgements

The authors wish to acknowledge the help given to them by G3JXA/M and many other mobile operators in practical tests and by G6CJ for advice on the validity of the methods employed in Appendix (2).

Appendix (1)

(a) The capacity of vertical wire clear of the earth can be shown to be

$$C \simeq \frac{2{\cdot}82l}{4{\cdot}6052 \log_{10}\left(\frac{2l}{d}\right)} \text{ pF}$$

where l = length in inches
d = diameter in inches

(b) The capacity of a sphere clear of earth can be shown to be $C \simeq 2{\cdot}82r$ where r is its radius in inches.

(c) The capacity of a disc clear of earth can be shown to be $C \simeq 1{\cdot}77r$ where r is its radius in inches.

(d) The capacity of a cylinder clear of earth and of length equal to its diameter can be shown to be $C \simeq 4r$ where r is its radius in inches.

In cases (b), (c), (d) the shapes need not be constructed of sheet material: cage construction is satisfactory if the wire size is not less than 14 s.w.g.

Appendix (2)

The equivalent of a short loaded aerial of the type used on most mobile installations is of the following form, shown in Fig. 4.

This reduces to Fig. 5.

The coil, as a radiator, does not radiate into 120π ohm

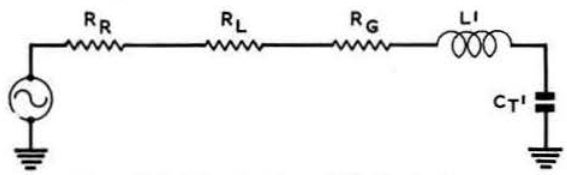


Fig. 5. This is the circuit to which Fig. 4 reduces.

impedance space and strictly, its radiation resistance cannot be added directly to those of the base and top. However, as the presence of the coil does not significantly alter the polar diagram of the aerial. direct addition will give a sufficiently close approximation.

$$\therefore\ R_R = r_B + r_L + r_T$$

$$L' = \frac{wL}{1 - w\,LC_L} \quad (w = 2\pi \text{ times transmitter frequency})$$

$$C_T' = \frac{C_T C_G}{C_T + C_G} \simeq C_T \text{ as } C_G \gg C_T$$

To calculate the radiation efficiency it is necessary to evaluate r_B, r_L, r_R and R_L.

The current in the base section is approximately uniform since $l_B \ll \lambda$ where λ is the wavelength of transmission.

Hence $r_B = \frac{80\pi^2 l^2_B}{\lambda^2}$ (1) ..... (i)

If the coil has small self-capacity and low radiation resistance the current in it is uniform and hence

$$r_L = \frac{80\pi^2 l^2 L}{\lambda^2} \quad \text{.....(ii)}$$

The current in the top section falls sinusoidally to zero at the top.

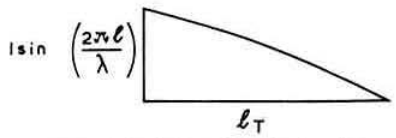


Fig. 6. Calculation of effective length.

The effective length (see Fig. 6) is:

$$\frac{\int_0^{l_T} \text{I} \sin\left(\frac{2\pi l}{\lambda}\right) d\left(\frac{2\pi l}{\lambda}\right)}{\text{I} \sin\left(\frac{2\pi l_T}{\lambda}\right)}$$

$$\simeq \frac{l_T}{2} \text{ for } l_T < \frac{\lambda}{40} \text{ (i.e., } l_T < 13' \text{ for top band)}$$

$$\therefore\ r_T = \frac{80\pi^2}{\lambda^2}\left(\frac{l_T^2}{2^2}\right) = \frac{20\pi^2 l_T^2}{\lambda^2} \quad \text{..... (iii)}$$

If the coil has a magnification factor of Q

$$R_L = \frac{wL^1}{Q} = \frac{1}{wC_T'Q} = \frac{\lambda}{2\pi V C_T' Q} \quad \text{..... (iv)}$$

where V = velocity of electromagnetic propagation in free space. The radiation efficiency of Fig. 5 is

$$\eta = \frac{R_R}{R_R + R_L + R_G} \quad \text{.....(v)}$$

$$\text{now } R_R = \frac{80\pi^2 l_B^2}{\lambda^2} + \frac{80\pi^2 l_L^2}{\lambda^2} + \frac{20\pi l_T^2}{\lambda^2} \quad \text{(From (i), (ii), (iii))}$$

$$= \frac{20\pi^2}{\lambda^2}(4l_B^2 + 4l_L^2 + l_T^2) \quad \text{..... (vi)}$$

$$\text{Hence } \eta = \frac{\frac{20\pi^2}{\lambda^2} 4l_B^2 + 4l_L^2 + l_T^2)}{\frac{20\pi^2}{\lambda^2}(4l_B^2 + 4l_L^2 + l_T^2) + \frac{\lambda}{2wVC_T'Q} + R_G}$$

(From (iv), (v), (vi))

$$= \frac{40\pi^3 V C_T' Q\,(4l_B^2 + 4l_L^2 + l_T^2)}{40\pi^3 V C_T' Q\,(4l_B^2 + 4l_L^2 + l_T^2) + \lambda^3 + \frac{}{2\pi V C_T' Q \lambda^2 R_G}} \quad \text{..... (vii)}$$

Consider the denominator;

$40\pi^3 V C_T' Q\,(4l_B^2 + 4l_L^2 + l_T^2) \simeq 10^5$ (for 160 metre use $\lambda^3 \simeq 4 \times 10^6$)

$2\pi V C_T' Q \lambda^2 R_G \simeq 10^7$

if $C_T = 50\ pF$

$Q = 200$

$l_B = l_L = l_T = 2$ metres

$R_G = 30$ ohms

$$\therefore \text{ (vii) reduces to } \eta = \frac{40\pi^3 V C_T' Q\,(4l_B^2 + 4l_L^2 + l_T^2)}{\lambda^2(\lambda + 2\pi V C_T' Q R_G)} \quad \text{(viii)}$$

Hence the necessity for a reasonably high C_T' (e.g. 50 pF) and a high Q can be seen for an aerial of given total height.

The above is true only if the coil has no self-capacity and a low radiation resistance. The latter will, in practice, be true but with long coils the self-capacitance will be comparable with the tuning capacity.[2] In this instance the current in the coil will not be constant and will fall toward the top of the coil. This will cause a reduction in the radiation resistance of the coil and due to the fall of current, a lower radiation from the top section. These effects will cause the coefficients of l_L and l_T to be reduced in Equation (vii) and the efficiency of the system will be degraded.

References

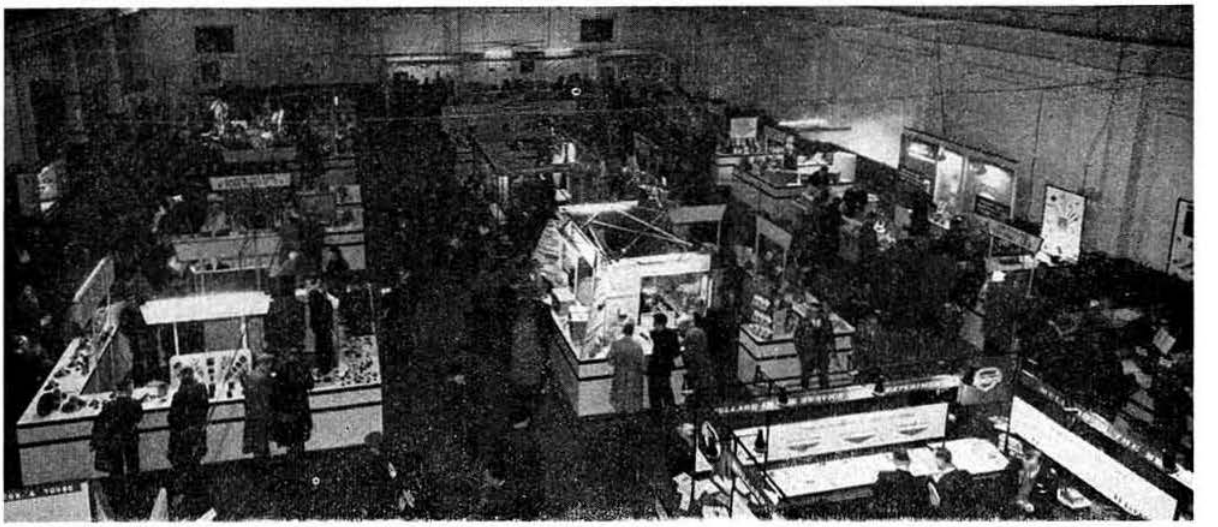
[1] "*Radio*," J. D. Tucker and D. F. Wilkinson, Volume I, pp. 44-45.

[2] "*Radio Designers' Handbook*," F. Langford-Smith, Fourth Edition, pp. 451-452.

Forthcoming Exhibitions and Conferences

Physical Society's Exhibition. Royal Horticultural Society (Old and New Halls), Vincent Square, London, S.W.1	Jan. 19-22
Television Society's Exhibition, Royal Hotel, London, W.C.1	Mar. 3-5
Electrical Engineers' Exhibition, Earls Court, London, S.W.5	Mar. 17-21
Audio Fair, Russell Hotel, London, W.C.1	April 2-5
Radio and Electronic Component Show, Grosvenor House and Park Lane House, London, W.1	April 6-9
International Instruments Show, Instrumentation Centre, Park Lane, London, W.1	April 6-10
I.E.E. International Convention on Transistors, Earls Court, London, S.W.5	May 21-27
International Plastics Exhibition, Olympia, London, W.14	June 17-27
I.T.U. Administrative Radio Conference, Geneva	Aug. 17-Dec. 16
National Radio & Television Show, Earls Court, London, W.5	Aug. 26-Sept. 5
R.S.G.B. Radio Hobbies Exhibition, Royal Horticultural Hall (Old Hall), Vincent Square, London, S.W.1	Nov. 25-28

At the conclusion of the Annual General Meeting on December12, 1958, Mr. L. E. Newnham, B.Sc. (G6NZ), presented trophies and awards to a number of members. In this picture Mr. Newnham is seated in the centre of the front row flanked by, from left to right, D. A. G. Edwards (G3DO), S. L. Hill (G8KS), G. M. C. Stone (G3FZL) and P.W.Winsford (G4DC). (Photo by G2LW)



A view of the R.S.G.B. Radio Hobbies Exhibition 1958 before the official opening by Air Marshal Sir Raymund Hart.
(Photo by the Tella Co. Ltd.)

THE R.S.G.B. RADIO HOBBIES EXHIBITION, 1958

First Public Demonstration of Colour Television—Many New Products for the Amateur —Kits for Everything

COLOUR television was the outstanding exhibit at the second R.S.G.B. Radio Hobbies Exhibition held in London from November 26 to 29, 1958. The demonstrations were arranged by Bernard Rogers (G3ILI/T) with the generous co-operation of Bush Radio Ltd., who loaned two experimental colour television receivers with 21 in. screens. The demonstrations, using films transmitted by the B.B.C. from its colour television equipment at Lime Grove and colour slides from Mr. Rogers' amateur station, aroused tremendous interest amongst visitors to the show. The compelling influence of colour TV could be judged from the wrapt attention shown by many visitors in the monochrome test card C when viewed on a colour TV set!

Both the B.B.C. station and G3ILI/T employed the British version of the American N.T.S.C. system. The B.B.C. station operated on Channel 1 and G3ILI/T on 436·2 Mc/s. Although the amateur transmitter, running a power of only 25 watts on peak yellow, was nine miles away, the pictures received at the exhibition were excellent, with only a little noise visible. The very much higher powered B.B.C. transmissions were, of course, noise-free for all practical purposes.

All concerned are to be congratulated on a first class demonstration of the quality of British colour television. Bush Radio deserve particular mention for the excellence of their receivers which, although laboratory experimental models, appeared to require little or no adjustment during the period of the show. It is worth noting that the demonstrations were the first public over-the-air displays of colour television in the British Isles. Once again the R.S.G.B. has shown itself to be in the vanguard of radio progress—it was as a result of representations to the P.M.G. that the B.B.C. itself came into being nearly 40 years ago.

New Products

Looking out over the exhibition hall one of the most impressive sights to meet the eye was the new **Minimitter** Minibeam, the latest co-axial fed version of the G4ZU beam for 10 and 15m, mounted on a Minimitter telescopic mast. It is claimed that this new mast, complete with an array of the Minibeam type, can be installed singlehanded. Other products on the same stand were the new Minimitter

TELLING THE WORLD
Council Member Eric Yeomanson (G3IIR) at the microphone of GB3RS on the R.S.G.B. dais at the Exhibition. Also in the picture is Gerald Gibbs (G3AAZ) who loaned the transmitter and did much of the operating. (Photo by B.R.S. 21759)

" mile-age proved " mobile transmitter and its companion control unit, transistorized power supply, whip aerials for 160, 80 and 40m and the mobile version of the Minimitter converter. The latter is available for combined amateur bandspread and general coverage, as is the 1959 Minimitter receiver, now designated the MR38. The Multi-Q Q multiplier unit has been restyled and is now housed in a small cabinet of the sloping-front meter type. The Mercury band switched transmitter, introduced at the 1957 R.H.E., remains unchanged in external appearance though it is understood that further minor electrical improvements have been made.

The first British s.s.b. transmitter for the amateur—the KW500 Viscount—was one of the many new items on the **K.W. Electronics** stand. This transmitter, which provides for the radiation of A1, A3 and A3a (upper or lower sidebands) on all bands from 3·5 to 28 Mc/s, incorporates voice control with anti-trip and runs 500 watts peak input on s.s.b. Another new transmitter, available either as a kit or completely wired and tested, was the KW Victor, a 100 watt version of the Vanguard. For the user of Vanguard and similarly rated transmitters, the KW200 amplifier, complete with high level modulator and power supply, has been produced to allow full power input.

A matching receiver for the Vanguard transmitter was the new KW55, a double conversion superhet (4·6 Mc/s and 85 kc/s i.f. stages) employing the Geloso receiver front-end. Use of this Geloso unit eliminates the most time-consuming part of home construction. Two new low-priced receivers for the short-wave listener, distributed by K.W. Electronics, the Creco Interceptor II and III, were on show for the first time. Both cover 9·5 to 180m in three switched bands, the scale length for each position of the range switch being equivalent to about 30 in. K.W. Electronics are also distributors of Moseley Trapmaster aerials, the example on show being a cut-down model of the three-element array for 10, 15 and 20m. The Moseley beam uses tuned traps mounted in the elements, in a similar fashion to a multiband dipole. Other items on the same stand were the R.E.E. 144 Mc/s amateur transmitter and 144 Mc/s converter.

Taylor Instruments exhibited two new high sensitivity multi-range test meters—the pocket size Model 127A with a sensitivity of 20,000 ohms per volt and the Model 100A with a sensitivity of 100,000 ohms per volt. The pocket size meter is claimed to be the lowest priced high sensitivity instrument on the market—it costs about £10. Other interesting test gear exhibited included the Model 110C resistance/capacity bridge and the Model 32A oscilloscope with a 4 in. tube.

Range Electronics showed the Trecoscope, a low priced oscilloscope (£17/17/0) using a 3AFP1 cathode ray tube housed in a steel cabinet finished in grey hammered cellulose. The Y amplifier is stated to cover 5 c/s to 3·5 Mc/s, while the time base covers 5 c/s to 150 kc/s in nine switched ranges. **Trusound Products** exhibited inexpensive stereo and high fidelity equipment and a transistor portable receiver.

Eddystone receivers and components, Moseley aerials, Jasonkits and a wide range of components were displayed by **Home Radio**. Of particular note was the new Eddystone type 898 slide rule dial with fly-wheel reduction gear with a ratio of 110 to 1. This dial is similar in appearance to that used on the 888 receiver but is only 7 in. wide. A vernier scale is provided. A useful item for the mobile enthusiast, and indeed any motorist, was the Gwish fire extinguisher.

Premier Radio, exhibiting for the first time, had a representative selection of their audio and other kits and components for the amateur and hi-fi home constructor. An example of the many items of hi-fi equipment was the new Petite record reproducer. Remploy soldering irons, also displayed, are fitted with an indicator lamp in the handle as an insurance against leaving the iron switched on inadvertently.

Teletron's stand was devoted to the many types of coil produced by the company together with typical home constructor designs using Teletron products. Ardente miniature electronic components were also shown.

Relda Radio, another newcomer to the Society's exhibition, featured surplus gear including Collins transmitters and a comprehensive range of small parts, components and tools, many of the type not easily available. Like so many exhibitors, Relda was also showing kits for building f.m. tuners and other high fidelity gear.

An unusual soldering tool, the Victor, which heats the work direct, was exhibited and demonstrated by **Allied Distributing Corporation.**

British National Radio School displayed selected lessons from its courses in radio and allied subjects, including the Radio Amateurs' Exam. course. Demonstrations of the School's recorded Morse training course were given throughout the show.

The **Mullard** stand took the form of an information centre for the amateur and home constructor. Details of the construction of many items of equipment designed around Mullard valves were available. A typical design for stereophonic sound enthusiasts, capable of 7 watts output, used an ECC83 and push-pull ECL82s in each channel. A much simpler instrument used a single ECL82 in each channel with ample gain for a crystal pickup or sound tuner. Another item for the audiophile was a tape amplifier using a ready wound potcore in the oscillator circuit. Two oscilloscopes, both using the DG7-32 c.r.t. (which requires an h.t. voltage of only 400 volts) were on show. The student's version is intended to be constructed by VIth form pupils in schools. The Service oscilloscope was designed primarily for use by TV service engineers and can be built from standard components. It should also prove of interest to experimenters and transmitting amateurs. A transistor audio design was a 15 watt public address

FIRST CLASS WORKMANSHIP

Some of the fine home constructed equipment exhibited by members on the Society's stands. In the centre, the 12-valve communications receiver built by E. St. B. Sydenham (G3LOK) which won for him a voucher for £10. To the right is a home-built tape recorder by A. T. Baldwin (A.1529). (Photo by B.R.S. 21759)

amplifier or modulator using push-pull OC16s in class B. The same type is also used as the driver. The speech amplifier employs two OC71 stages and an OC72.

Troughton and Young displayed some fine examples of contemporary housings for high fidelity equipment, the Ferrograph stereo tape recorder and the Avantic stereo amplifier. **Enthoven Solders** exhibited their wide range of solders and fluxes and the Superspeed soldering iron.

Kits, kits, kits . . .

Kits now seem to be available for building practically everything used by the home constructor and radio amateur, from pre-tuned beams to test gear.

Jasonkits displayed f.m. and a.m. tuners, stereo amplifiers and pre-amplifiers and a new switched f.m./TV sound tuner. The kits for a valve voltmeter and an oscilloscope (to a Mullard design) shown for the first time mark this firm's entry into the test gear market.

Daystrom showed prototypes of several new British Heathkits including the DX100 transmitter (employing push-pull 6146s in the p.a. and push-pull KT88s in the modulator), the DX40 transmitter (with carrier controlled modulation), the UXR-1 transistor portable receiver, the O-12 general purpose oscilloscope with 5 in. tube and the Model V-7A/U.K. valve voltmeter which is already in production. The input impedance of this valve-voltmeter is 11 Megohms, equivalent to a sensitivity of 7,333,333 ohms per volt on the 1·5 volt range. High fidelity prototypes shown included the S.88 16 (8+8) watt stereo amplifier.

Mayra Electronics exhibited and demonstrated the Maykit hybrid car radio, which employs five valves of the 12 volt h.t. type with a power transistor for the audio output. The tuner unit is pre-aligned and construction is further simplified by the use of a printed circuit. An r.f. stage is included. Consumption from a 12 volt battery is stated to be only 1·5 amps.

Cossor Radio and Television featured the 701K v.h.f. f.m. receiver and the 562K audio amplifier as well as kits for building single and double beam oscilloscopes. **Clare Instrument Company** displayed an inexpensive unit for making an a.c./d.c. multimeter in addition to examples of their transformers for popular amplifiers. **Telegraph Construction and Maintenance** had a showcase displaying some of their many products.

A comprehensive display of parts for the home construction of both amateur rotary and TV and f.m. aerials occupied the **Richard Maurice Equipment Co.'s** stand. All the special castings and fittings which simplify the work involved were on show.

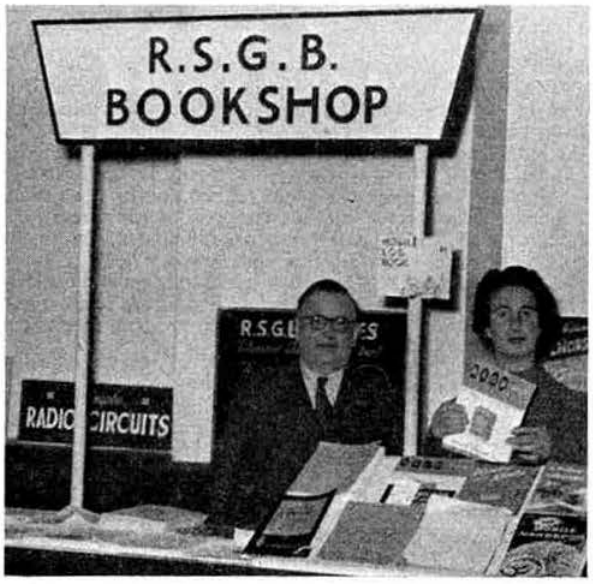
Printed circuit technique reduces to a minimum the construction time for the Labgear a.f. power meter, exhibited by **U.T.M. Ltd.** Another useful item on this stand was a television picture equalizer for balancing the signals received from Band 1 and Band 3 stations. Small specialized components were an important part of the display on the **Whiteley Electrical** stand in addition to hi-fi stereo loudspeaker systems, and a transistor amplifier employing a printed circuit.

Philpotts Metalworks exhibited many examples of "built-to-measure" metalwork for the amateur and professional. A sign of the times was the increased use of contemporary colours; the black crackle so beloved a few years ago seems to be disappearing. Considering its ability to collect dust that is probably a good thing!

Racal Engineering exhibited the famous RA17 communications receiver, which covers 500 kc/s to 30 Mc/s without bandswitching. Although beyond the reach of most amateurs, its many unusual features created much interest. Another exhibit on this stand was the SA20 digital frequency meter covering 10 c/s to 100 kc/s.

An ingenious quartz clock was shown by **Standard Telephones and Cables.** The clock is controlled by a 40 kc/s crystal, divided down by hard valves and gas tube frequency dividing circuits to produce second pulses. Nomotron scaling tubes are then used to derive 1, 10 and 60 minute pulses which energize Nodistron numerical display tubes indicating the time as a series of four digits. A Nodistron tube itself comprises ten neon tubes in one envelope. Other exhibits included breadboard displays of the uses of transistors in an RC oscillator and a process timer, S.T.C. quartz crystals, Brimar valves including the 12 volt h.t. type for mobile use, silicon rectifiers (RS3 series) and S.T.C. capacitors.

Wires of all types were exhibited on the **London Electric Wire and Smith's (Lewcos)** stand: textile covered types for use where good abrasive resistance is necessary and space is not of great importance; enamelled wires, using both oil-based and synthetic based enamels; wires insulated with glass, asbestos, or p.t.f.e. for very high temperatures; resistance wires such as Eureka. Examples of **Printed Circuits'** material were also on show. Of particular interest was the Anacos earth rod, a hand-made heavy-duty (18 or 24 in.) spike which will stand being driven into hard ground without bending.



"GUIDE, CALL BOOK — CALL BOOK, GUIDE" Members helping in the R.S.G.B. Bookshop were kept busy throughout the Exhibition selling the 1959 "R.S.G.B. Amateur Radio Call Book," the new "Guide to Amateur Radio" and other technical publications. (Photo by B.R.S. 21759)

Support from the Book Trade

Data Publications showed a wide range of their publications and reprints, including the latest edition of the *Radio Amateur Operator's Handbook*. Examples of equipment to designs published or to be published in the *Radio Constructor* were displayed.

A new great circle map centred on the United Kingdom was a welcome exhibit on the **Short Wave Magazine** stand. The map shows prefixes corrected up to the end of October 1958. Many American publications, including the *Beam Antenna Handbook*, *V.h.f. Handbook* and *Novice Handbook*, were also on show as well as the current issue of *Short Wave Magazine* itself. A transitorized 10 watt audio amplifier was exhibited on the **Wireless World/Electronic Engineer** stand which also displayed many Iliffe publications and *Wireless World* reprints.

The Service Stands

A "live" Naval station working to units throughout the United Kingdom was a feature of the **Royal Naval Reserve** stand. Equipment displayed included the B.40 high frequency transmitter and B.41 companion receiver, and the Pye type 619 u.h.f. transmitter and type 691 u.h.f. receiver. Current Signals equipment was displayed on the **Army** stand, including an AR88 modified for f.s.k. operation, teleprinters and modern transmitters and receivers. The stand was manned by members of the No. 1 Special Communications Regiment (City of London) Royal Signals, T.A., and operators of the regiment's club station G3LUN.

Many examples of home-built amateur equipment were shown by the Royal Air Force Amateur Radio Society on the **R.A.F.** stand. Among the items displayed were the G8FC five band s.s.b. exciter, a phasing rig for 10 to 80m capable of 25 watts p.e.p. with its internal power supply or 125 watts with an external supply. The unit was designed by G3HSR. V.h.f. equipment included a 25 watt 2m portable transmitter, a v.h.f. version of the Monimatch and the high power 2m transmitter used at G3IRS and employing push-pull QY3/65A valves. PE1PL was worked from the exhibition using the latter equipment.

WAIT FOR IT!

Mr. L. E. Newnham, G6NZ (President, 1958) making the draw for the Racal RA17 receiver presented in connection with the Exhibition.

(Photo by the Tella Co. Ltd.)

The Amateur Stands

As at all R.S.G.B. exhibitions, the Society's own stands were a rendezvous for members. The main stand, which housed the Exhibition Station GB3RS and the R.S.G.B. Bookshop, was devoted primarily to equipment entered in the Home Constructors' Competition. The Silver Plaque, presented by Phil Thorogood (G4KD) was won by K. R. Clarke (G3KRC) of Barnet, Hertfordshire, with his very ambitious "Hamvet" test gear. This is entirely home-built and comprises a cathode ray oscilloscope with push-pull X and Y amplifiers, 22 range multimeter, 1 Mc/s crystal oscillator (producing 100 and 10 kc/s signals by means of a multivibrator), an audio oscillator covering 3 c/s to 300 kc/s, an a.m./f.m. signal generator, a valve voltmeter and a CR bridge—practically an exhibition in itself! All the separate units fit together most ingeniously. The prize of a voucher for £10 was awarded to E. St. B. Sydenham (G3LOK) of Cowes, I.o.W., for his beautifully built 12 valve double conversion superhet for all bands from 1.8 to 30 Mc/s. A view of this receiver, showing its 14 in. long slide rule type dial, is given in one of the photos. A voucher for £5 was won by W. E. Thompson (G3MQT) with his hybrid mobile receiver for 1·8 to 2 Mc/s. Valves requiring only 12 volts h.t. are used in the receiver proper and an OC16 power transistor in the output stage which is mounted in a separate unit with the loudspeaker.

The judges highly commended a mobile transmitter-receiver for 420, 144, 70 and 28 Mc/s shown by G2DD (later displayed on the V.h.f./U.h.f. stand). Separate plug-in converters and transmitters for each band fit into the unit proper which contains a 14 valve tunable i.f. covering 28-32 Mc/s. A transistor voltmeter and multirange micro-ammeter built by G2AOP was also highly commended. Made to a circuit design by Mullard, this instrument exhibited many ingenious constructional devices and was worthy of close inspection by those interested in the use of transistors in home-built gear.

A Difficult Task for the Judges

Selection of the prizewinners was a difficult job for the judges who were greatly impressed by the amount of thought obviously put into the design and construction of the equipment displayed. Among the many items shown were a mobile transmitter for 3·5 Mc/s (G3ESP), a phone/c.w. transmitter-bandspread receiver for 1·8 to 30 Mc/s (G3JXA), a home-built tape recorder (A.1529), a simple receiver for the beginner (B.R.S. 22008), a two valve amateur bandspread receiver (G3AAZ), a cathode ray oscilloscope and noise generator (B.R.S. 4194) and a compact 100 watt table top transmitter with high level modulator (G3LKH).

Home-constructed equipment was also displayed on the **V.h.f./U.h.f.** stand where considerable interest was shown in B.R.S. 20533's three valve 144 Mc/s receiver (not a super-regen but a complete superhet receiver with an excellent noise factor) and in G3HWR's 1250 Mc/s converter. Other equipment included G3JHM's 10,000 Mc/s test bed, a 144 Mc/s miniature mobile phone transmitter (G3LCK), a 420 Mc/s tripler using a 4X150 (G3MEO), a 15 watt 144 Mc/s transmitter and receiver and halo aerial (G3IIR) and a two band p.a. for 144 and 420 Mc/s (G3IRW).

R.S.G.B.-I.G.Y. Activities Publicised

The **I.G.Y.** stand, despite its simplicity, aroused great interest amongst members and public alike and the I.G.Y. Co-ordinators were kept busy answering the many questions on the Society's contribution to the I.G.Y. The display showed typical examples of the detailed reports sent in by observers with maps and diagrams illustrating some of the results already achieved. As members will see elsewhere in this issue, the Society's research programme is to continue in association with International Geophysical Co-operation 1959.

R.H.E. on the Air

Throughout the time the exhibition was open GB3RS was in operation, contacts being made with stations all over the world. The equipment was loaned by G. G. Gibbs (G3AAZ) and E. W. Yeomanson (G3IIR) and the aerials erected by the Norwood and South London Group.

Amateur Television was again represented by the British Amateur Television Club. In contrast to previous years no large scale demonstrations were made; instead the accent was on showing television from the amateur point of view. G3MZH's camera was used with G2DUS's camera to show the excellent results which can be obtained from home made gear. Examples of other Amateur Television equipment were also on show.

Acknowledgements

Thanks are recorded to all who helped to make the exhibition a success, in particular those who loaned equipment for display, manned the stands and undertook duty on GB3RS.

Organization of the R.S.G.B. side of the exhibition was carried out by the Exhibition Committee, the members of which were: C. H. L. Edwards (G8TL), *Chairman*, W. H. Allen (G2UJ), G. W. Norris (G3ICI), F. F. Ruth (G2BRH), P. A. Thorogood (G4KD), A. J. Worrall (G3IWA), E. W. Yeomanson (G3IIR) and J. A. Rouse (G2AHL) *Secretary*. The Exhibition Manager was P. A. Thorogood (G4KD) to whom much credit is due for the outstanding success achieved.

International Geophysical Co-operation 1959

By G. M. C. STONE (G3FZL)*

READERS may well wonder at the new title to this column previously called *I.G.Y. News*. The reason is, of course, that the International Geophysical Year ended on December 31, 1958. During the fifth C.S.A.G.I. (International Committee for the I.G.Y.) meeting held in Moscow during August 1958 the question of a possible extension of the I.G.Y. was discussed. It was, however, decided to terminate the I.G.Y. as planned at the end of 1958 but a resolution in the following terms was carried; " Observational and data collecting activities in the geophysical and related sciences be conducted during 1959 on the same general plan as in 1957-58, under the direction of C.S.A.G.I. or C.U.R.A.G.I., as far as practicable and at such level and in such fields as may be determined by each participating Committee. The name ' International Geophysical Co-operation 1959 ' is suggested for this period."

Following this meeting a special Committee for Inter-Union Co-operation in Geophysics (S.C.G.) was formed. This committee will succeed C.S.A.G.I. in due course. A provisional programme of World Days and Communications was developed by the Working Group at Moscow and is a modification of the programme of World Days carried out during the I.G.Y. A World Geophysical Calendar for 1959 has been issued for Regular World Days (R.W.D.), Regular World Intervals (R.W.I.) and World Meteorological Intervals (W.M.I.). The final World Geophysical Calendar for this year will be notified to all observers.

In addition to the planned periods of intensified observational effort a network will continue to operate to provide warnings of unusual solar or cosmic-ray activity. It is hoped that the I.G.Y. National Warning systems will continue to serve as the focal point for the distribution of such warnings. An alert will be declared when the first signs of exceptional solar activity are noticed and this will be followed by a Special World Interval (S.W.I.), if justified.

Four kinds of advance alerts will be issued to give warnings to observers. These are:

Solar Flare Alert; Magnetic Storm Alert; Cosmic Ray Alert; Aurora Alert.

It is not yet known in detail how these warnings will be distributed, but it will be remembered that during the I.G.Y., the B.B.C. transmitted warnings immediately after the 11 p.m. news bulletin, while the warnings were also sent out on WWV. The meteorological network was used for national distribution. Further information will be given as soon as it becomes available.

R.S.G.B. Activity 1959

The question of R.S.G.B. participation in I.G.C. 1959 was considered as soon as the decisions of the Moscow meeting became known. As a result, the Council has decided that the radio-wave propagation research work commenced during the I.G.Y. shall continue. All observers who sent in reports during the I.G.Y. have been notified of the Council's decision and their participation during I.G.C. 1959 has been requested. The response has been good and there are now sufficient observers to ensure continuation on the same scale as during the I.G.Y. However, it is necessary to modify the programme, partly because effort must now be diverted to the analysing of observations already made and also because some fields have been adequately explored. A meeting of the I.G.Y. Group (now I.G.C. 1959 Group) called to discuss in detail the continuing programme, will have been held by the time this contribution is read. It is the view of the writer that the following subjects should be covered:

(i) Satellite (and space-probe) signal reception.
(ii) V.h.f. long range tropospheric, meteor scatter and auroral propagation.
(iii) U.h.f./s.h.f. propagation.

Much was learnt during the I.G.Y. by general participation in many aspects of the broad programme. Now it has become necessary to reduce the number of projects undertaken by individual observers to allow a greater degree of specialization. Observers will be selected according to their particular capabilities to undertake certain specific tasks, such as meteor scatter or auroral propagation. A satellite signal reception group has already been set up within the Wirral Club under the leadership of Mr. Vic Collins (G2HOF). This group has already proved its capabilities by making excellent recordings of *Sputnik 3* telemetry which, together with those of the South London Group, have been notified to the Satellite World Data Centre at Slough.

With the exception of auroral reports, general reports of 144 Mc/s operating or listening have not proved to be nearly as useful as reports of regular schedules (except under very good conditions). The reason for this is obvious and efforts will therefore be made to increase the number of regular schedules. This does not preclude listeners participating, since regular reports can be made of the reception of distant stations keeping known schedules. The same is true of meteor scatter work, but any reports of aurora are useful since time limits and the spread of communication paths can thus be established.

" Project 50 Plus," the regular reception of broadcast and television stations has been of limited use since the identification of the station involved is often very difficult, especially under good conditions. However, another project somewhat on the lines of " Project 50 Plus " has proved to be very useful. This is the regular monitoring of signals from the Gee navigational chains operating in the 69-79 Mc/s band. Since this may prove to be of general interest more details are given later in this article. However, certain " Project 50 Plus " reports have provided useful information, especially those from isolated regions, such as the Channel Islands. There, in fact, the majority of observers working under the A.A.C., Walter Butt (GC2FZC), have been television viewers.

It will also be necessary to continue, on a more limited scale, meteorological observations. Of the results obtained so far there has been a considerable amount of conflict even amongst observers located near one another. Some of this may be due to instrument or reading errors but nevertheless there remains definite evidence that, in fact, there can be quite markedly differing meteorological conditions in

* *R.S.G.B., I.G.C. 1959 Co-ordinator, 10 Liphook Crescent, Forest Hill, London, S.E.23.*

adjacent localities. Further study will be aimed particularly to resolve such anomalies.

Thus we can expect a continuation of most fields of study started during the I.G.Y. under the heading of I.G.C. 1959 and there seems to be no reason why the work should not become a permanent feature of Amateur Radio activity.

Monitoring Gee Stations in the 69-79 Mc/s Band

The Gee navigational system, developed during the 1939-45 war, was first used early in 1942 by Bomber Command and is still in widespread use. The system employs a chain of stations using pulse modulated transmitters operating on certain spot frequencies between 20 and 80 Mc/s. A Master station radiates a pulse of r.f. which is received by either two or three Slave stations, according to the Chain. These Slave stations have transmitters which are triggered by the received pulse after a certain definite delay and a further pulse is then radiated from each Slave. By measuring the time interval between the reception of the Master pulse and each Slave pulse it is possible to plot a position on a specially-prepared Gee lattice chart. This chart is basically a set of constant time difference lines (hyperbolae) plotted on a standard chart; there is one set of hyperbolae for each Master/Slave combination, i.e. two sets for a chain employing two Slaves. These charts (Gee lattice charts), which are available from Edward Stamford Ltd., 12 Long Acre, London, W.C.2. give the approximate location of the Master and Slave stations of each particular Chain; in each case the Master forms one, and the Slave the other, focus of each set of hyperbolae.

The hyperbolae on the lattice chart are coloured as follows:

Master A/Slave B	Red
Master A/Slave C	Green
Master A/Slave D	Purple

There are three chains of particular interest for the study of propagation in the 69-79 Mc/s band. These are the

Eastern Chain: Frequency approximately 74 Mc/s

North Eastern Chain: Frequency approximately 69 Mc/s

Scottish Chain: Frequency approximately 79 Mc/s.

Equipment has been (and may still be) available on the surplus market which can be used to display the Gee signals. Such equipment was shown on the I.G.Y. stand during the 1958 R.S.G.B. Radio Hobbies Exhibition where it created much interest. The basic equipment consists of a Receiver R.1355 with an R.F. Unit 27, an Indicator 62 or 62A and suitable power supplies of 300 volts at 200 mA, 6·3 volts at 15 amps and 1·8 kV at 5 mA. There are certain other similar pieces of equipment which may also be available. Basically all that is required is a suitable receiver having a bandwidth of about 0·5 Mc/s and an oscilloscope.

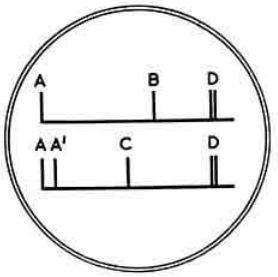


Fig. 1. Typical display of Gee signals.

The stations transmit in a definite sequence and are suitably presented and coded to enable identification. A typical Gee display is shown in Fig. 1. The Master transmits with a recurrence rate of 500 pulses per second and the B and C Slaves transmit alternately. After each second pulse from the Master station a subsidiary pulse known as A " ghost " is transmitted to enable identification of the B and C Slaves. The C always follows the A ghost pulse. The D Slave (when applicable) is a double pulse which appears after both the A and also A/A ghost pulses. Identification of each particular chain is effected by coding the A ghost pulse; for example the Eastern Chain has a coding of two blinks, the North Eastern three blinks and the Scottish four blinks.

By the regular observation on a daily basis of the signals received from each chain it is possible to observe the variations caused by changing weather conditions and also to obtain an indication when propagation conditions are exceptional. Signal strength trends can be observed and frequently quite accurate predictions of optimum v.h.f. propagation paths can be made. Such equipment has been in use at G3FZL for the past year and has proved a valuable adjunct for operation in the 144 Mc/s band. It is proposed to continue this work and it is hoped that more observers will equip themselves so that a regular flow of such data can be collected.

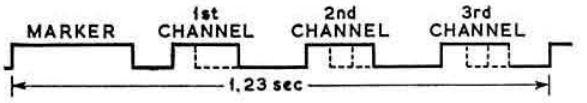


Fig. 2. Telemetry signals from Sputnik 3.

Sputnik 3 Telemetry

Details, released by Soviet scientists and made available in this country by the Royal Society, have now been published concerning the telemetry apparatus contained in *Sputnik 3* and the coding of the 20·005 Mc/s telemetry signals. The signals are of the form shown in Fig. 2 and consist of a long marker pulse followed by three pulses, the first being either 50 or 150 milliseconds wide and the second and third being either 50, 100 or 150 milliseconds wide. Pulse number 1 gives an indication of whether the power source in the satellite is from solar or chemical batteries; the other two pulses are varied in width by a scintillation counting apparatus as shown in Fig. 3. A sodium iodide crystal (Na. J) is used and this releases photons when bombarded by cosmic rays. When a total energy of 2×10^9 electron volts has been collected in the scintillation crystal, the anode relay (relay 1) changes position. The dynode relay (relay 2) changes position when an energy of 18×10^9 electron volts

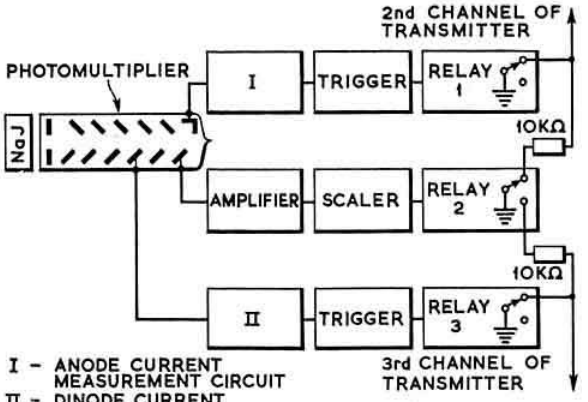


Fig. 3. Block diagram of the scintillation counting apparatus in Sputnik 3.

has been collected. Relay 3 is operated by the counting circuitry and changes position after 2048 "events" in the photomultiplier tube.

The width of pulses 2 and 3 depend upon the series resistance between channel 2 or channel 3 input and earth such that if R is zero then the pulse width is 50 milliseconds, if R is 10K ohms it is 100 milliseconds and if R is infinity it is 150 milliseconds. The significant part of the telemetry is the time required for each signal relay to go through a cycle. With a long series of signal recordings it is possible by transcribing these on to film to follow the changes in length of pulses 2 and 3 and to determine which relay is operating at any particular time.

Arrangements are at present in hand to transcribe the signal recordings made by the Wirral and London telemetry groups who made many thousands of feet of recordings during the early life of *Sputnik 3*.

With the failure of the chemical batteries in *Sputnik 3*, the telemetry signal has degenerated into a two pulse system with only pulses 2 and 3 being radiated from the transmitter now powered by the solar batteries. Orbit predictions are prepared by the Radio Research Station at Slough and are published in the *Daily Telegraph*.

Sputnik 3 Frequencies

The frequencies used by the Russian *Sputnik 3* were 19·993, 19·995, 19·997 and 183·6 Mc/s. This information was obtained by G3YY during a contact with UC2AA who quoted *Pravda*.

This special QSL card was received by R. Winters (B.R.S. 20133) for his report on the reception of signals from the first Russian Sputnik. The original card is printed in full colour and is a fine souvenir of a great occasion.

Mullard Award

AT a Press Reception in Mullard House, Torrington Place, London, W.C.1, on December 10, 1958, the then President of the R.S.G.B., Mr. L. E. Newnham, B.Sc., formally accepted the offer of the Mullard Award from Mr. T. E. Goldup, C.B.E., a Director of Mullard Ltd.

In his speech Mr. Goldup paid a tribute to the part played by the Society during the 1939-45 war and spoke of the honour recently bestowed on the General Secretary when he was appointed to serve on the all-important Frequency Advisory Committee set up by the Postmaster General. Mr. Goldup also referred to the constant desire on the part of his company to assist members of the Society in their experiments and to the cordial relations which exist between the Society and the Radio Industry. He congratulated all concerned with the success of the recently held R.S.G.B. Radio Hobbies Exhibition.

In accepting the offer of the Mullard Award, Mr. Newnham, on behalf of the membership, thanked the Mullard Company for its generosity and Mr. Goldup in particular, for his kindly references to the Society.

Mr. T. E. Goldup, C.B.E., a Director of Mullard Ltd. (right) speaking at the Press Reception given on December 10, 1958, to mark the first announcement of the Mullard Award. Mr. L. E. Newnham is at the extreme left. Others in the picture from left to right are Mr. Norman Caws (Hon. Treasurer), the General Secretary, Mr. Frank Hicks-Arnold, Miss May Gadsden.

National Listeners' Contest

THE winner of the Listeners' Contest organized by Bristol B.R.S. Receiving Group and held on October 26, 1958 (to coincide with the *CQ* World Wide DX Contest) was C. Parkes (A.1629) of Blackwater, Surrey (2,685 points). Second and third respectively were J. Baldwin (A.1426) of Bristol (2,574 points) and W. Stewart (A.1394) of Edinburgh (2,352 points). Altogether 43 B.R.S. and Associate members submitted entries.

FY60.62

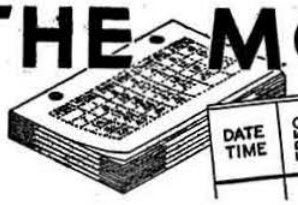
THE rather unusual call-sign FY60.62 was issued for one month to Pierre Lanlanet (F8MV) who was the winner of a French contest for radio amateurs. F8MV was deposited on a desert island to search for buried treasure and reported his progress each Thursday and Saturday to Radio Luxembourg. At the last moment, he found the treasure, reported to be worth £6,000.

Jodrell Bank Observatory Appeal

A CHEQUE for £10/10/- has been sent to the Jodrell Bank Observatory Appeal by Mr. P. A. Thorogood (G4KD) on behalf of R.S.G.B. members and visitors to the 1958 R.S.G.B. Radio Hobbies Exhibition.

Members who would like to make a donation to the Appeal are invited to send remittances to Mr. Thorogood, 35 Gibbs Green, Edgware, Middlesex. Mr. Thorogood is making arrangements for such donations to be acknowledged with a special Jodrell Bank QSL card.

THE MONTH ON THE AIR



By S. A. HERBERT (G3ATU)*

News from Far and Wide

MALAYA: New prefix authorised. VS2CP, now on leave in the U.K., passes on the news that as from Janauary 1, 1959, all VS2 call-signs were amended and Malayan amateurs now use the prefix **9M2.** Thus VS2CP himself becomes 9M2CP, while the other VS2s similarly keep their old suffix after the 9M2. VS2CP has been on low power s.s.b. and while on leave he is to build a s.s.b. exciter and linear p.a. for 7, 14 and 21 Mc/s for use on his return to Malaya.

Germany: G2MI passes news from **DL3CU** that he and other DLs have again been given permission to operate on 160m until March 15, 1959. The DLs may transmit only between 1825 and 1835 kc/s and DL3CU favours tuning other parts of the band for replies. (G2MI has suggested to him that the DLs listen from 1·9 to 2 Mc/s). At any rate, the idea is for others to keep clear of the German frequencies and thus ensure trouble-free QSOs.

Trucial Oman: News of the highest importance arrives from **MP4DAA,** now firmly established on Das Is., some 150 miles south-east of Bahrain and 90 miles from Abu Dhabi. Das is part of the Independent Sheikdom of Abu Dhabi, which itself forms part of the Trucial Oman States. Now all six of these Oman States are virtually independent, they manage their own internal affairs, while the U.K. looks after their external affairs and security; so there seems to be a strong case for according them all separate status for DXCC, a point which A.R.R.L. may like to consider. MP4DAA is currently on 14 Mc/s c.w. only and work gives him little time on the air, but he hopes to start a club and to put Das well and truly on 10m phone as well.

Zanzibar: Peter Dodd (**VQ3PBD**) has despatched all but a few of the QSLs resulting from his **VQ1PBD** trip. The handful remaining are for " hard cases " whom experience suggests are unlikely to QSL. So if anyone due to a VQ1PBD card feels he needs one, all he has to do is to send his own QSL—first.

Canada: Eric Hall (ex-G3JJD) is now happily settled as **VE7BV** and is active each Sunday at 17.30 G.M.T. on phone between 29·5 and 29·7 Mc/s, where he finds the chance of a solid QSO much better than down on the low end of ten. Down there, Eric says the VE7s are often drowned by S9 VE3 and VE4 signals, so look for his 60 watts at the high end of the band. G3AYL, who was active on 20 phone until last June, is now operating as **VE3AEC** and **VE3AEC/W9.** He has also held the call-sign ZL1AKL.

U.S.A.: Those in need of South Dakota should note that a group of amateurs in that State, led by " Chief " **W0BLZ** have arranged an activity weekend from 23.00 G.M.T. on February 13 until 23.00 on February 15, during which time they will monitor the lowest 25 kc/s on 3·5, 7, 14, 21 and 28 Mc/s and the lowest 25 kc/s of each phone sub-band for station calling " CQ S.D."

Bahrain: Lee Grant (ex-ZD3G) should now be rattling out Morse as **MP4BCN.** Lee remarks that Jack Ward, **ZD3E,** is back again in Gambia and, though primarily a phone man, plans some c.w. work for the benefit of the rest of us.

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

Ceylon: 4S7RD (ex-G3KUD) comments sadly that six months have passed since the State of Emergency put paid to transmitting activity out there, with no sign yet of when their gear will be returned. Dick listened to part of the R.S.G.B. phone contest and hopes the following will like to know that they had good signals in Ceylon. 07.00-08.00 on 21 Mc/s produced Gs '2QT, '3DC, '3YF, '5ZT, '6GQ, '3CLG, '3CQE, '3FFH, '3HCU, '3HFD, '3JMV, '3JZG, GM3BCD, GI3IVJ, GI3JIM, while from 08.00 to 08.30 G.M.T., G4HW, '5HZ and '3HCU, with GM3BCL were heard on 28 Mc/s.

Nigeria: Ted Howell (ex-SU1FX, G3GUP) has been active for three months as **ZD2GUP,** mainly on 28, 21 and 14 c.w., but occasionally on 7 Mc/s also. Ted says the DX on 7 Mc/s even early in the evenings is surprising, but he finds he has to work hard for his QSOs there. Too many DX unconscious Europeans are the trouble, mainly. ZD2GUP likes to QSL via the bureaux, but he will oblige direct if I.R.C.s are enclosed.

Everything here is home brewed, old man.

Christmas Is.: Derek Cox (**G3KHZ**), still without a VR3 call-sign, hears lots of rare DX but few Gs. Indeed, G3FUR and G5BZ were the only two heard recently with any sort of a signal. What he does hear, though, would make any G's mouth water, with 20m yielding ZM6AL ('078. 1900Z), ZK1AK ('050), ZK2AD ('090), CR8AC ('050) KM6BL ('010), KW6CB ('074), ZS9N ('068), VQ8AL ('070), FU8AE ('350, c.w. and phone), CE0ZG (Juan Fernandez, '050, 23.50), KX6CW, XW8AM, HS1C, FO8AS, KH6JE/KJ6 ('305, s.s.b.) and FK8AS ('100). '8AS was on as FW8AS during November. QSL to Box 151, Noumea.

Yet Another !

The Niagara Frontier DX Association recently announced that the first award for " Outstanding Performance in the Art of Amateur DXing " will be issued in January 1959 to the amateur or group of amateurs most instrumental in providing exceptional DX activity. The award is of an international nature. Once each year, the 12 past recipients will be reconsidered and a permanent wall plaque of unique design awarded to the year's outstanding DXer.

Ten Metres DX

Conditions on all our bands showed a falling off during the month, but this is normal for December, regardless of the state of the sun-spot cycle. Early in the New Year things will doubtless return to normal—in other words, DX will be bursting out all over.

Meanwhile **GM2DBX** (Methilhill), now cheerfully active again after two years of ill health, worked 9G1AA for his hundredth country on ten phone. Jimmy now has centuries on 28, 21 and 14 phone and with a QSL to hand from FU8AD, he should be in a mellow frame of mind. He states that SV0WT (Crete) puts in a good signal on 14 Mc/s A3.

G3GQK (London, S.E.), who is 108 ft. a.s.l., used 35 watts to a G4ZU Minibeam to net a fine catch in CE0ZG (18.30) who may be QSLed via CE2AA (Box 3016, Santiago). This was on phone and "Blondie" also worked VP8DS (19.30), KR6JF (13.40), JA1BF (09.50), MP4BCI, ZL, VE7 and ZK2AB (09.10) and would like to know more about SJ3AG, a YL, working Ws at 15.00! **G5JR** (Reading) has resumed his phone activities after over a year of rebuilding and changing QTH. Buck now has a loaded three element beam 18 ft. high and in ten hours recently he worked W, CX, LU, ZP, TI, CO, ZC4 and VE8DW, who was S9 with a great flutter. The G5JR beam was pointing south at the time, so the QSO may have been over a long, long path.

G3EYN (Macclesfield) came on briefly to work UI8AS (13.30) and KZ5LC on the key, while **G3IOR** (Norwich) is back on the air in between courses for exams. In addition he is running a course himself for R.A.E. aspirants. Pat used phone for two new ones, 9G1AA and 9G1CH, while on c.w. he worked IT0AA, on the Pelagic Is. QSL via I1SM. I5AAW, SV0WT (Crete) and SV0WB (Rhodes) helped the G3IOR score reach 210, with some 150 QSLed, but three Wyoming, two Nevada, four Kentucky and 11 KL7 QSOs are still unconfirmed.

G3FPK (London, E.10) recently enjoyed a few days' "summer" holiday, but he found ten poor, with loud UA1—9, OH, weak KR6 and little else, until the W's took over. SV0WAF (Athens) was new and ET2HM was also QSOed on c.w. (QSL via ET2US).

GM3HWN (Larbert) was delighted to have a solid phone QSO with W1JXM, while running only 20 watts to a 130 ft. wire. Reports were S8/9 both ways with the W using 300 watts and a rotary beam.

For the listeners, **B.R.S. 20249** (Sutton) starts things off with a résumé of the 21/28 Contest, when ten proved best, with FS7RT (18.00) and PY0NA of the Trinidad Is. expedition new ones. **B.R.S. 2292** (Hounslow) had a bout of "flu" to thank for some afternoon listening and Charles benefited to the tune of HI8RM, VE3EGD/SU, VP5RD, VP6, VP9, VQ3CF, VQ5AG, VS6CL, XE3AF, YS1IM and 9G1AA on phone. Also on phone, **A.1583** logged CM7HQ (20.55), CR6BO, ZS4MG and other DX items.

Fifteen Metres DX

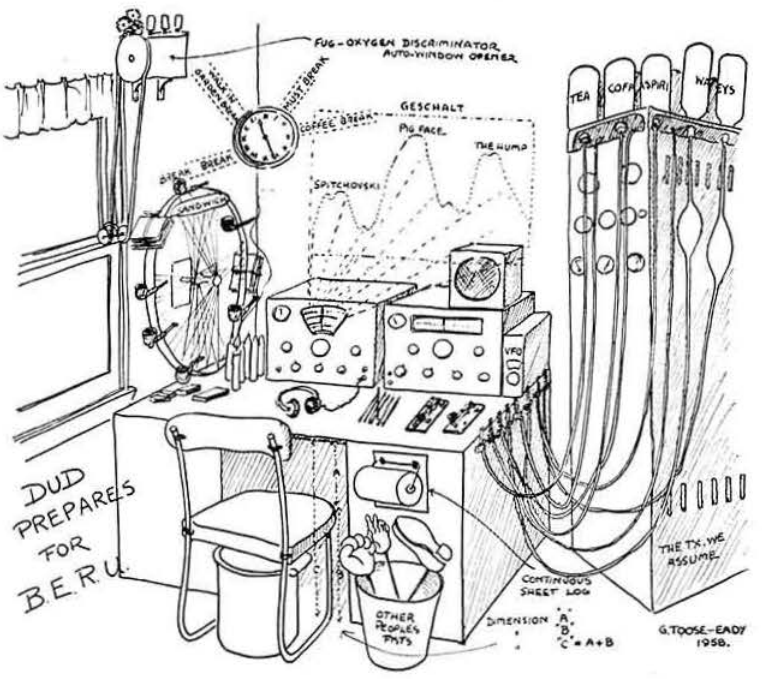
Scrappy, but better than ten is the concensus and **A.1426** settled for YN1JR(A3), whose QSL is to hand. **G3LKZ** (Cleadon, Co. Durham) agrees with his neighbour G3ATU that conditions could be better, but worked FS7RT ('015, 16.40), F9QV/FC, VP7BT, VK6RU, OQ5, ZL and W7IMA (Arizona), which isn't bad, even on c.w.

G3EYN used c.w. to land UF6CC, UA0SJ (Urkutsk, Zone 19), and VK9RR (12.00), while **G3IOR** was also on the key when he worked KH6MG/ZK1, VP2AY, FB8XX, XZ2TH, TI9AC, VK9AD (Norfolk Is.) and VK9DB, all new ones, also ZD2GUP, UA0GF (Zone 19), OH0NC, CN9CJ (?), OQ0PD, CR9AH, LU2ZS (South Shetlands), while AP5B, ZD7SA, ZD9AH, CR5AR, VR2, ET3 and JZ0PB escaped. They would have been new, too! New ones on phone were PY0NA, HL9KT, KM6BP, ZK2AB, VP8CV (Falklands), XZ, VP2AB, VP2GN, VP2DC, VP2LB, VP2MR, with PY7AFN (Fernando da Noronha) heard. Quite a haul and quite a band, too!

G3KRC (Barnet) weighs in with results obtained with 40 watts of c.w. to a 67 ft. Zepp. Eight months since his demob. have given Keith 89C and though he has just chased VK9AD unsuccessfully for three hours, air-mail QSLs from ET2KY and KX6BT surely make amends.

B.R.S. 20249 logged VP3HAG, a new one, but he thought the Ils a nuisance during the R.S.G.B. Contest. Anyway, Malcolm heard 41C during the affray.

B.R.S. 2292 whisked up VP2KFA (s.s.b.) and CR7AD, ET2VB, OR4OR, VS9AQ, JA, KL7, VP8CR, KR6 and ZL on c.w. **A.1583** (Penryn, Cornwall), heard the mysterious AC1AGI (18.00), and John is rightly puzzled as to the whereabouts of this one. But CE0ZG (19.00) is definitely on Juan Fernandez, and must by now have stolen some of the thunder of the approaching CE0 expedition. **B.R.S.20135** logged XE2FL, VE3EGD/SU, OX3KW and FS7RT on phone, while **B.R.S. 20317** dug down for ZS9G(A3) and VP2KFA, VP4LA, SM5WN/LA/P ('050, 14.50) and KR6HX(A1).



Those who heard "Dud" Charman (G6CJ) lecture to the Society last year on "The Human Machine as a Radio Operator" will appreciate the sublety of G. Toose-Eady's clever cartoon. Those who missed the lecture will enjoy our cartoonist's interpretation of that part of Dud's lecture which concerned B. E. R. U. Contests.

Twenty Metres is Still Alive

What a band! It carries S9 locals, but still manages much of the world's DX traffic and long may that continue.

G6XL (Leeds) worked KC6JC ('018, 12.30) and has a QSL—as the KC's first " G "! Ws were calling KC6SP on '100, midday, and earlier. Francis heard KJ6BV ('240/265, 10.45 on) calling a W2 for 40 minutes with no result. ZD7SA is often on '075-'080, around midnight and ZD7SE was heard ('035, 00.18), but who is EAAD95, called by Ws ('035/'040, 01.00 onwards)?

G8LZ (Maidstone) is regularly on 14 Mc/s c.w. with a modest 25 watts to a 66 ft. Zepp and his QSOs include FB8BZ (19.00), VE8AY (20.00), PY7AN (19.30), PK4LB (Sumatra, 14.00), all around 14,100 kc/s. G8LZ who has the O.H.A. Award, recently worked OH2HK, the S.R.A.L. Certificates Manager, who was duly thanked in person.

G2CIL (Horsham), another 25 watt man, had phone QSOs with XZ2TH, ZK2AB, VQ4, ZL, LU, PY, ZP and W, which shows what can be done. **G3KRC** worked FG7XC for a good one at 20.25 (c.w.) and **G3EYN** contacted HZ1AB, KH6IJ (17.30) and VS9MI (20.40). **G3IOR** missed ZD7SA, '7SE, ZD9AH, PK4LB, VK0KT and PY7SC, but he did work VP2KFA and LA2JE/P for new countries.

Pat has had a letter from UO5AA, who reads the BULLETIN with interest. UO5AA is active on all bands and is happy to work all-comers. His awards include DXCC and O.H.A. and he welcomes QSLs and photographs, which he answers 100 per cent. Direct QSLs can go to Glushkov Valentin Petrovisz, Radio UO5AA, P.O. Box 1, Kagul, Moldavia, U.S.S.R.

G3FPK reaches 144C thanks to ZDIGM, but he missed VP8BK (LA1RC), now active again from South Georgia. Norman's remarks in *M.O.T.A.* regarding calling KM6BL (Mac) brought a letter from Mac's friend K0GZN, who gives the good news that KM6BL does QSL 100 per cent—in fact his postage in one month came to $67.50. Mac is on c.w. and phone—3·5 to 28 Mc/s and he will oblige any hour of the 24 for Gs who want a KM6, QSO and QSL. Write to L. F. " Mac " McCollough, Detachment COMBARPAC, Navy 3080, F.P.O., San Francisco, Calif., for a " sked," call him 5 kc/s high or low *and* enclose I.R.C.s with your card.

B.R.S. 2292 heard SU1KH (who is in the *Call Book*), FM7WN, HZ1AB (s.s.b.) and FM7WN on phone and logged F2CB/FC, FY7YI, HE9LAC, HK4JC, ET2KY and VP7NA on c.w. **B.R.S. 20135** picked VK3HL and VK5OB out of the evening phone QRM and also logged VE3EGD/SU, CT2AH and SV0WT. **B.R.S. 20317** added yet another four to his impressive total; VP2KFA, VP2MX, MP4DAA (15.00, '046) on c.w. and VK9AD (s.s.b., 18.30 to 19.00, '325) were new. Others heard included CR9AH (13.00, '028), FB8YY, FU8AE (08.45, '333), LA2JE/P (19.50, '020) and SM5WN/LA/P (23.30, '050) on the key, with FS7RT, PJ2MC and YS1MS on s.s.b.

The Low Frequency DX

Business remains far from brisk, low down, but **B.R.S. 2292** heard OY7BS, LA2JE/P, PY and ZC4 on *forty*, while PI1BRD was a new country on *one-sixty*. **B.R.S. 20317** logged DL1YA on Top Band (1828 kc/s, 00.40), with DL7AH/LUX and KP4CC ('520, 00.15) on *eighty* c.w.

G3FPK hopes more DX will use 7 Mc/s this winter—he knows exotic calls use the band for local rag-chews—and he wonders about a PX3AC, worked on forty c.w. Norman has a 7 Mc/s QSL from VP3BO, written on a photograph of the Kaieteur Fall, pending the arrival of more orthodox QSLs from the printer.

G2CIL remarks that UA1KAG, club station of Leningrad Academy, is QRT, the 803 p.a. valve having blown! They cannot replace this tube, so if anyone can oblige, Radio UA1KAG, Leningrad, is the address.

All that now remains is to apologize to the writers of the few letters which arrived too late for inclusion this month. The postal rush is over for another year, so reports for the February *M.O.T.A.* should arrive normally and by January 19, please. Best of DX and good hunting again. 73.

Frequency Predictions for February 1959

PREPARED BY J. DOUGLAS KAY (G3AAE)

BAND	NORTH AMERICA East Coast	NORTH AMERICA West Coast	CENTRAL AMERICA	SOUTH AMERICA	SOUTH AFRICA	NEAR EAST	MIDDLE EAST	FAR EAST	AUSTRALIA
M.U.F.	39 Mc/s 1500	26·5 Mc/s 1800	43 Mc/s 1330	40 Mc/s 1200	39 Mc/s 1400	42 Mc/s 0930	42 Mc/s 0930	42·5 Mc/s 1000	30 Mc/s 0800 SP
28 Mc/s	1200/1930	1800	1030/2000	0900/2000	0800/1900	0730/1800	0700/1700	0700/1600	0700/1000 SP
21 Mc/s	1100/2200	1530/1915	0945/2230	0800/1200 1830/0100	0700/0900 1330/2300	0630/1915	0630/1815	0630/1745	0930/1030 LP 1000/1700 SP
14 Mc/s	1000/0000	1430/0000	2100/1230	0700/0930 2200/0430	1900/0400	0530/0000	1300/2200	1230/2030	1430/2015 SP
7 Mc/s	2100/0830	0800	0600	0700	2300	1530/0830	1700/0200	1630/2300	1600 SP
3·5 Mc/s	2300/0700	0800	0600	0700	2300	2100/0430	2300	2000	1600 SP

DX TELEVISION PREDICTIONS: BARBADOS 1200/1500. ADEN 0800/1100. CYPRUS 0900/1000. BOMBAY 0900/1030. SINGAPORE 0915/1045. ACCRA 0800/1400. NAIROBI 0800/0830 and 1330/1430. TRINIDAD 1200/1500. BAHREIN 0800/1030. TEL AVIV 0900/1015. CEYLON 0830/1000. CAIRO 0900/1015. DAKAR 0900/1500. Based on B.B.C. Channel I Sound Frequency of 41·5 Mc/s. (Video frequency is 45 Mc/s).

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

FOUR METRES AND DOWN

By F. G. LAMBETH (G2AIW)*

THERE has been some comment on the accuracy achieved in calculations of distances based on great circle measurement. The method employed is the same as that used by navigators at sea, and is based on the knowledge of the latitude and longitude of each location. Once these co-ordinates are known, the distance between two points can be easily calculated by the expert. The writer first came into contact with this method years ago in connection with pigeon racing; in this case, Ordnance Survey maps were marked at the exact location of pigeon lofts, and distances from race points were accurately calculated down to the nearest yard. This is not usually necessary in calculating radio distances, but could be used if two very closely located stations claimed a record. Usually however two fixed points are identified by their latitude and longitude and calculations are made from these particulars.

More Reports, Please!

At this period of New Year Resolutions, may we ask those who do not yet do so, to let us have reports when they have interesting news from time to time. Remember, it is *your* news that makes the column!

Transistorized V.h.f. Equipment

Members will remember the transistorized 2m equipment shown by F3SK at the last V.h.f. Convention in London. This remarkable apparatus has since had some try-outs, and has certainly shown its mettle. In August it was used in poor conditions on the top of a hill near Alençon (about 1,300 ft. a.s.l.). Good QSOs over distances up to 130 miles were made on phone and c.w. The output power of the portable transmitter is slightly below 1 watt! The receiver gave excellent results and **F8TD** and **F8MX/A**, both at about 130 miles, were heard well on a simple dipole. For general use, however, a four-element Yagi was used. Later, **F8WV** used the gear also near Alençon at 600 ft. a.s.l. and had many QSOs over about the same range. Since then, however, new receiving gear has been built which is transistorized. This includes a c.c. converter and a tunable first i.f. system. The converter uses an RCA 2N384 (r.f. amplifier), 2N384 (mixer), 2N384 (40 Mc/s overtone oscillator) and a further 2N384 (tripler to 120 Mc/s). The first i.f. system employs two stages of r.f. amplification (RCA 2N247s) and the same type of transistors in the mixer, variable Colpitts oscillator and as first 455 kc/s i.f. amplifier. All in all this portable all-transistor receiver uses 18 transistors and eight diodes.

On November 29 **F3SK** tried out his new receiver at F8GH's QTH. F9CQ (RS59 at 50 miles), F8LO (56 miles) and ON4PE (130 miles RS58) were all heard. The Belgian station was certainly surprised to learn that he was being received on an all-transistor receiver! On December 1 from Asnières, F9XG (RS57) at 120 miles was worked in poor conditions, F3SK is now working on a 435 Mc/s all-transistor receiver, which he thinks will be more difficult!

F3JN, F3YE and F3SK have built "collector dip" meters, similar to the one described in *QST* recently. F3YE's version uses a 2N247 and works up to 40 Mc/s. F3JN and F3SK use 2N384s; one meter operates between 3·3 and 80 Mc/s, the other between 20 and 200 Mc/s. F3SK has also built a high stability transistorized crystal oscillator as a master oscillator for a v.h.f./u.h.f. transmitter—the frequency is independent of the load—using but two transistors and no tuner circuit. (Are there no U.K. amateurs carrying out similar development work?—Editor.)

* *21 Bridge Way, Whitton, Twickenham, Middlesex.*

Two Metre News

England

G3IRS (R.A.F. Locking) will shortly be operating on s.s.b. Special clipping is being installed to obviate certain modulation difficulties. G3IRS asks that DX station frequencies should be announced, when known, to give others a chance to locate them.

G3WW (Wimblington) who used to be a stalwart on 2m but now alas! appears to have graduated to s.s.b. and other bands, says that there is still plenty of interest in v.h.f., evidenced by the ease with which he disposed of three of his four converters. Richard thinks the response to his advertisement shows (1) real interest in 2m from licensees with call-signs from G2 +2 to G3M . . . and (2) the need for a really cheap commercially made simple converter. However, we should still like to see G3WW back on 2!

G5MR (Hythe) writing about "Worked and Heard on V.h.f." thinks the lists would be very slender if all "G" calls were omitted. (The peculiar differences as regards v.h.f. DX QSOs must be taken into consideration and the 100 miles rule strictly adhered to.)

B.R.S. 19162 (Dewsbury) found conditions and activity fair at the beginning of the period but the month on the whole was quiet. OK1VR/P was a good signal on the evening of November 22 in average conditions—a few weeks before, (when conditions were good) OK1VR/P was inaudible at Dewsbury. There was a visible aurora on December 4, but it did not appear to affect 2m. '19162 comments on the exclusion of Gs from the worked and heard lists and suggests publishing the best 12 heard by B.R.S. members and the best ten worked and five heard by transmitting operators. "This should give everybody, from hill toppers to coal miners a chance of getting their list in the BULL."

B.R.S. 20133 (Melton Mowbray) can only offer (as stations received over 100 miles) GB2RS and GB3RS at the R.S.G.B. Radio Hobbies Exhibition. He is forced by radio studies to miss Monday activity night, and finds there is seldom anything on Saturdays or Sundays, apart from GB2RS, so the outlook is accordingly rather bleak. However, 6m appears to take care of these weekends!

B.R.S. 20162 (Selsdon) has had a much less strenuous month from the logging aspect! Activity has been reasonable from the north, north-west and south-west, but very much less from the Greater London area, which has appeared dead from 20.00 till after 22.30. The barometer was consistently over 1,000 mb until December 9 when it had fallen to 972. Although at one time it reached a very high figure (similar to the opening period) and there was again fog, nothing unusual happened on this occasion. **A.1491** (Palmers Green) had a very poor month with only a few short periods of good conditions. F3LP was heard on one occasion. The Yagi is going into the roof space in time for the January c.w. contest.

G3JGJ (Paignton) says things have been quiet, although he has been on every evening from 18.00. The barometer was down to 976 mb on December 16. **G5DW** (Ashcott) tells a similar dismal story of conditions at an all-time low, with the lowest barometric pressure yet recorded locally. For the first time the sked with G2NY failed, signals being audible but unreadable both ways. G5DW missed the aurora on December 13, but experienced a short one on the 4th at 18.35 for about ten minutes when several GMs were heard and called, but all had gone by 18.45 and c.w. was T9 again.

G8VZ (Princes Risborough) is still keeping daily skeds with G3JWQ and G3KHA but activity otherwise has been less than usual. **G5BM** (Highnam, Glos.) says the chief point of interest was the rapid aurora of December 13. After working stations on 10m (so that's where they go!) auroral QRM was noticed on TV at 17.40, and a typical fade-out on the east-west path on the l.f. bands was experienced. Various garbled carriers were heard on 2m, but no appreciable time could be spent on the band until 20.00, when G3MED was worked on phone; very good for 100 miles and 981 mb pressure! At 21.10, the TV QRM was noticed again and GM3EGW was immediately contacted on 2m, S7 at first, fading to S3/4 later. By 21.30 the aurora had gone. The following day 10m was quite normal, which is unusual so soon after an aurora.

Scotland

December 13 produced an auroral opening and GM2FHH had quite a pleasant time between 18.40 and 20.00 G.M.T. All the following were heard at pretty good strength and most of them were worked: G2NY, G3IRS, G3MED, G5YV, GM3BDA, GM3EGW, GM3LAV, GI3GXP, OZ7BR, OZ7CV, OZ7IGY, SM5ABA, SM6BTT, SM7BA, SM7BAE, SM7AED and quite a number of unidentifiable phone signals. Most of the I.G.Y. beacon stations were heard, but GM2FHH had to close down at 20.00 and cannot say how things went after that, except for a quick look at 20.25 when G3MED was worked. However at 23.30 G.M.T. the band was back to normal! There was another good aurora on the night of December 4/5 but only GMs and GI3GXP were heard. Bearings were very much west of north, with GI3GXP at 310°.

G3HBW reports that **GM3DIQ** was also in on this aurora, and experienced it over a longer period. The aurora does not appear to have been noticeable in the south, however, and this is evidenced by the fact that only northern G stations were worked by GM2FHH (with the strange exception of G3IRS).

GM6WL reports **GM3DIQ's** participation in the aurora of December 4 between 18.30 and 19.00 G.M.T. when ON4ZK was worked. Later that night a few more Continentals were heard as well as many G stations, but although GM3DIQ was looking for those not worked before, there were no further contacts. On December 13, during the aurora on that day **GM3GUO** heard a number of Continentals and was especially impressed by the strength of GI3GXP's signals. GM3EGW heard three SM stations but made no QSOs. An OZ station was raised, however. **GM3INK** could still hear GM2FHH via aurora at about 20.00, but things were fading then, and it is not thought that the aurora reappeared later. GM6WL's sked with GI5AJ is still going well, sometimes in poor conditions. GM5VG and GM3DIQ still continue their QSOs with GM3DDE and GM6SR. Also active, GM4HX, GM3INK, GM2CQI, GM6ZV and GM3LAV.

Wales

B.R.S. 21476 (Penarth) says 2m has suffered very much from poor conditions and consequent lack of activity, while **GW3MFY** (Bridgend) remarks that things are definitely back to normal after the opening. Two skeds are being run, one with G3JHM (Worthing) at 20.00 daily (except Saturdays) and the other with G3BDQ (St. Leonards-on-Sea) at 19.40 except Saturdays and Sundays. So far, there have been only six QSOs out of 15 tries with G3JHM and none with G3BDQ! Reports from anyone in south-east England would be appreciated. GW3HOJ made an appearance from Swansea on November 24 and was worked, but has not been heard since. G3LTF was worked at last on November 30 when G5MA was also contacted at S9+ with G3FP and G3KEQ for good measure. G3GVC (Portsmouth) was worked on December 1, with conditions better than average. G2AIW is still elusive, although called on December 1 and 5. Since then conditions have been poor.

Overseas

SM5MN (Linkoping) has sent a local Stockholm map, with several stations marked. If their exact locations are required they can now be determined easily. It is a pity in some ways that the QSOs between G5MA/SM5ABA, G3KEQ/SM5RT, G3FZL/SM5AY and G3HAZ/SM5AY were just short of the record!

LA9T near Oslo reports another marvellous display of the aurora on the night of December 4/5. With the beam north, LA4VC and LA9T heard SM4BIU, SM5BDQ, SM6BTT, DL1FF and another SM. LA9T extends best v.h.f. wishes for 1959.

LA9T also says aurora was in evidence for the first time simultaneously on 2 and 6m on December 13 from 15.00/21.00 G.M.T. On 2m those worked were SM6BTT, SM7YO, SM5BDQ, SM7AED, SM5SI, SM7BZX, SM5ABA, SM6ANR and GM3BDA. DL0IGY was heard from 17.30/18.30 G.M.T.

Meteor Scatter

G3HBW (Bushey Heath) was busily engaged during the Geminid period (December 10/14) but results on this occasion were less than hoped for. Two " pings " were received from SM4BIU on December 11 and 13 in each case at about 05.05 G.M.T. Respective strengths were S6 and S4. G3HBW also reports that SM6BTT now has four skeds as follows: YU2HK (23.00/00.00); HB9RG (00.00/01.30; OE1WJ (01.30/03.00); I1ACT (03.00/0430).

Further details from **SM6BTT** (via G3HBW and SM5MN) are as follows:

SM6BTT heard nothing of YU2HK, OE1WJ or I1ACT but SM5IT (Stockholm) identified I1ACT on December 12 at 03.04 G.M.T. but results with HB9RG are as follows: On December 11 SM6BTT heard at least two " bursts " and eight " pings " from HB9RG. Nothing was heard on December 12 but on the 13th SM6BTT heard 11 " bursts " and 15 " pings " (longest burst ten seconds, strongest S3). The following day SM6BTT heard 14 " bursts " and 25 " pings " from HB9RG (longest burst 15 seconds, strongest S4). On December 15, nine " bursts " and 50 " pings " were heard.

SM5MN reports that HB9RG and SM6BTT worked each other on December 13 at 00.14 G.M.T. during the Geminid shower. The QSO was satisfactorily taped. At the Swiss end the equipment comprised p.p. 4X250B (1 kW. input), Tapetone converter and Collins 75A4; at SM6BTT ½ kW input, 417A converter and NC300. This was the first HB9/SM QSO on 2m and probably the first meteor scatter contact outside North America.

Four Metres

Four metre enthusiasts in the U.K. will be glad to learn that Norwegian amateurs are to have the use of 70 Mc/s until at least the end of 1959.

G2JF (Ashford, Kent) is now operational and has daily QSOs with G5MR and F8GH. The equipment is v.f.o. controlled. Contacts are not numerous, but conditions are quite interesting. G5MR, G5MP, and G2JF are always hoping to hear new stations on this band.

G5MR (Hythe, Kent) says conditions have been mainly

good, especially during the period of high barometric pressure; lately, with the barometer, they have fallen off. Activity among British stations appears to be increasing.

Seventy Centimetres

G3HAZ (Northfield, Birmingham) had some good QSOs during November. On the 16th G2HDJ and G2RD were raised, while the 21st brought a contact with G3JMA. The Midlands area activity period is on Sunday mornings between 10.00 and 13.00 G.M.T. Stations active around Birmingham include the following: G2DCI, G2FNW, G2HCG, G3APY/M, G3BA, G3DFL/T, G3EJO, G3GZM, G3HAZ, G3IOO, G3JWQ, G3JZG, G3KPT, G3KQJ/T, G3LGJ, G3LHA, G3MXW/T, G3MYD/T, G3MXY/T. A goodly list, and look at the /Ts in it! We are glad to have this list, which is the first real lightening of the darkness of 70cm for some time.

On Sunday mornings, GM6KH, GM5VG, GM3GUO and GM6WL exchange strong phone signals. GM3NG has been active between 19.00 and 20.00 for almost a fortnight continuously, putting very loud phone into Glasgow!

Six Metres

Further good news from Norway is that permission to use 6m until the end of 1959 at least has been granted.

LA9T (Moss) reports that LA7Y worked KP4ACH on November 15 for the first LA/KP4 on this band. LA9T himself worked many Ws, Ks and VEs; also KP4ACH between November 14 and December 2. No auroral effects were observed on December 4. During the aurora of December 13 SM4KW and SM5BRT were worked on 6m.

B.R.S. 20133 has progressed on 6m listening and sends a good log. All stations were received at weekends between 13.30 and 17.00 G.M.T. W5EXZ (San Antonio) has sent '20133's log to the A.R.R.L. I.G.Y. department who are apparently very interested. Cross-band working has diminished lately as the Ws and Ks have many possibilities of working stations in SM, LA, HB, as well as EI2W. The W/K and VE stations have usually no real incentive to listen on 10m.

A family bereavement has curtailed G4LX's activity, and a proposed removal to a new QTH has also affected the situation. Conditions on 6m have been below average, but two spells of auroral conditions have been observed. The first was on December 4 when SM3AIE was heard at 18.40 G.M.T. The note was T9 with a hollow effect, although there was very little auroral interference on B.B.C. TV channels. The second burst was on December 13 from about 14.00/21.30 G.M.T. No amateur signals were heard, but the effect on B.B.C. TV channels was intense.

B.R.S. 21476 (Penarth) found 6m seemingly less effective than last month, with only one good day observed. The pattern is similar to that of last year and the " old regulars " can always be heard when the band is open for DX. So far, the m.u.f. never seems to have risen so high as last season. At no time yet has it been possible to hear any American video signals on 55·25 Mc/s.

G2NR (Welwyn Garden City) asks whether it is of interest to ascertain the area over which a 6m station is heard during openings? This means a piece of intensive s.w.l. collaboration. All this arises from the comments and reports in this column, from which it appears that no one DX station appears in all reports, and indeed only a couple or so of the stations appear in more than one report. Similarly, stations heard at G2NR (November 16) do not appear in any of the reports! The most outstanding station heard (K5STI) was " many many db over S9 " but no one else appears to have heard him. It certainly sounds like very selective propagation. Perhaps listener members will comment on this.

The writer thanks all who sent him cards and seasonal wishes which are heartily reciprocated.

Good fortune to all. January reports by the 17th please.

R.A.E.N. News

By E. ARNOLD MATTHEWS (G3FZW) *

Extension of R.A.E.N.

THE Committee recently decided to invite the assistance of Affiliated Societies and R.R.s in the formation of new groups in those areas which have no organized R.A.E.N. activity. This, together with the efforts of C.C.s and A.C.s, C.R.s and A.S.R.s and individual members has resulted in the prospect of new groups in **Dorset, North-East Cheshire, South-East Lancashire, Oxford, Plymouth, Surrey, Torbay** and **Flintshire.** Prospective members may obtain further particulars from G3FZW, whose address will be found at the foot of this page.

Around the Groups

Following their successful demonstration to Hampshire police, leaders of the **Southampton** group recently visited the Chief Constable at County Police H.Q. when he outlined his requirements in an emergency. It seems that, in addition to providing communications between most of the larger towns in the county and Winchester, contact may also be required with Oxfordshire, Berkshire, Buckinghamshire and Dorset. Readers will recall that the first three counties were mentioned recently in this column when developments in Bucks. were discussed, and the present situation argues very strongly for joint effort by County Controllers in order that the best use may be made of our resources in the area. It becomes increasingly obvious that County Controllers can no longer be concerned with their own counties alone and must be prepared to reserve a proportion of their members for inter-county communications. The development of trunk routes should, in time, ease the problems.

Although the R.A.E.N. Committee does not favour the appointment of a National Controller a strong case can be argued for the institution of a registry of plans in order to avoid duplication which could arise in situations such as is discussed here.

Cornwall group held their first exercise in December. Although a mains failure at Truro added to the realism, the exercise went off successfully, G2AYQ taking over control when G3AET went QRT. **South Devon** members also co-operated. The Cornwall Group is to be divided into two in the near future so that the North and South coasts will be under separate control.

The **Northern Scotland** C.C., GM3KHH, reports that he is dividing his area into three and that GM3BCL is organizing a recruiting drive in Aberdeen. Recruits are also coming forward from the Banff and Caithness areas. The group holds weekly schedules with the Central Scottish Group.

On December 7 the **Notts. and Derbys.** Group held a meeting at Sutton-in-Ashfield, when the Hon. Secretary, R.A.E.N. Committee spent a pleasant afternoon with officers and members of the group during which local problems were discussed. The C.C., G8ON, has planned a very interesting exercise which appears to be a cross between a motor rally and a game of chess!

Western Trunk Route

The **Northern** section has now received instructions from Section Manager G3DWQ and a schedule of exercise dates has been planned for the whole of 1959. Mr. I. T. Cashmore (G3BMY), 104 Long Lane, Blackheath, Birmingham, has undertaken the duties of Section Manager for the **Centre** Section.

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* *1 Shortbutts Lane, Lichfield, Staffs.*

Annual General Meeting

Minutes of the 32nd Annual General Meeting of the Radio Society of Great Britain, held at Over-Seas House, Park Place, St. James's Street, London, W.1, on Friday, December 12, 1958, at 6.30 p.m.

Present: The President (Mr. L. E. Newnham, B.Sc., in the Chair), the Executive Vice-President (Mr. W. R. Metcalfe), the Honorary Treasurer (Mr. N. Caws, A.C.A.), the Immediate Past President (Mr. D. A. Findlay, D.F.C., A.C.A.), Messrs. W. H. Allen, M.B.E., H. A. Bartlett, C. H. L. Edwards, A.M.I.E.E., W. J. Green, E. G. Ingram, A. O. Milne, W. A. Scarr, M.A., E. W. Yeomanson (Members of the Council), Mr. John Clarricoats, O.B.E. (General Secretary), Mr. John A. Rouse (Deputy General Secretary), Miss May Gadsden (Assistant Secretary) and about 80 other members.

Apologies: Apologies for absence were received from Messrs. V. M. Desmond (Past President), J. H. Hum (Member of Council) and F. K. Parker (A.R. for Stamford).

Notice Convening the Meeting

The General Secretary read the notice convening the Meeting.

Minutes

It was moved by Mr. Green, seconded by Mr. Lambeth and resolved that the Minutes of the 31st Annual General Meeting, and of the Extraordinary General Meeting held on December 13, 1957, as published in the January 1958 issue of the R.S.G.B. BULLETIN, be approved and confirmed.

Matters Arising

In answer to a question received prior to the Meeting from Mr. D. Deacon, the President stated that the Council gave consideration during the year to holding the A.G.M. on a Saturday but had decided to adhere to a Friday evening. The Council's decision was set out in the Résumé of the Minutes of the April Meeting, published on page 576 of the June 1958 issue of the BULLETIN.

Annual Report of the Council

The Annual Report of the Council was submitted by the President who, in answer to a question by Mr. R. C. Hills, stated that plans were being made to improve the South of England News Bulletin Service on 2m.

In answer to another question, the President stated that the Council is powerless to take action against the Zonal Representative who made no attendances during the year to June 30, 1958. Letters had been sent to the member in question but no replies had been received. As the member concerned had been properly nominated and elected to serve as a Zonal Representative the Council is unable to call upon him to resign his seat on the Governing Body.

In answer to a point raised by Mr. Deacon the President explained that it would not have been appropriate to refer to the IXth C.C.I.R. Plenary Assembly in the Annual Report, as the Meeting is not due to take place until April 1959. Mr. Newnham explained that C.C.I.R. does not deal with frequencies and it is unlikely that any of the technical matters discussed at the Assembly will have any affect on Amateur Radio. Dr. Smith-Rose, and probably Mr. A. L. Budlong (Secretary, A.R.R.L.), would be at the Assembly.

The President moved and it was resolved that the Annual Report of the Council, as published in the November 1958 issue of the R.S.G.B. BULLETIN, be adopted.

The President read to the Meeting a short Supplementary Report covering developments and events that had taken place since the end of the financial year. (The Supplementary Report is published on page 344 of this issue.—EDITOR.)

Mr. Winsford remarked that he was particularly pleased to note that the G.P.O. had indicated that it may be possible for a representative of the Society to attend the Geneva O.A.R.C. as a member of the U.K. Delegation.

Report of the Honorary Treasurer and the Audited Accounts

Before moving the adoption of his Report the Honorary Treasurer (Mr. N. Caws) dealt with two matters raised by Mr. Deacon, notice of which had been given prior to the meeting. The matters related to the slightly different manner in which the accounts had been drafted and with the revenue received from the Exhibition Manager in connection with the 1957 R.S.G.B. Radio Hobbies Exhibition.

It was then moved by Mr. Caws, seconded by Mr. Newton, and resolved that the Report of the Honorary Treasurer and the Audited Accounts for the year ended June 30, 1958, be approved and adopted.

Mr. Newton in seconding the motion congratulated Mr. Caws on his excellent report. (Applause).

Election of Council 1959

The President announced that Dr. R. L. Smith-Rose, C.B.E. had been duly elected without opposition to serve in the office of President for the year 1959, and that Messrs. J. D. Kay and K. E. S. Ellis had been elected to fill the two vacancies that will occur among the Ordinary Members of Council on December 31, 1958.

The President stated that the result of the Ballot was as follows:

Mr. J. D. Kay	873 votes
Mr. K. E. S. Elllis	553 votes

* * *

Mr. G.M.C. Stone	492 votes
Mr. R. C. Hills	403 votes
Mr. F. G. Lambeth	335 votes
Mr. E. Banks	322 votes
Mr. G. C. Price	315 votes

It was reported that 1,706 Ballot Papers were accepted and four rejected by the scrutineers.

The President thanked those who had assisted with the scrutiny of the Ballot.

In answer to a question by Mr. Winsford, the Secretary reported that approximately 22 per cent of the Corporate Members entitled to vote had, in fact, done so. For information the Secretary gave the number of Ballot Papers that had been accepted at each election since 1947. The figures were as follows:

1947	3,286	1950	2,532	1953	1,992	1956	1,431
1948	2,914	1951	2,381	1954	1,663	1957	1,547
1949	2,670	1952	2,254	1955	1,409	1958	1,131

It was estimated that 16 per cent of the membership entitled to vote last year, in fact, did so.

The President announced that the following members of the 1958 Council were not required to seek election for the year 1959:

Mr. L. E. Newnham	Retiring President
Mr. D. A. Findlay	Retiring Immediate Past President
Mr. W. R. Metcalfe	Executive Vice-President
Mr. N. Caws ..	Honorary Treasurer
Mr. H. A. Bartlett ..	Ordinary Member
Mr. C. H. L. Edwards	Ordinary Member
Mr. J. H. Hum ..	Ordinary Member
Mr. A. O. Milne ..	Ordinary Member
Mr. W. A. Scarr ..	Ordinary Member

Mr. W. J. Green	..	Zonal Representative
Mr. E. G. Ingram	..	Zonal Representative
Mr. H. W. Mitchell		Zonal Representative
Mr. A. C. Williams		Zonal Representative
Mr. E. W. Yeomanson		Zonal Representative

Auditors

It was moved by Mr. Caws, seconded by Mr. Stone and resolved that Edward Moore & Sons be re-appointed Auditors for the year to June 30, 1959, at a fee of 100 guineas.

Before concluding the Meeting the President expressed his thanks and the thanks of the Council to those Members who during the year now ending had shown the true spirit of Amateur Radio by helping forward the work of the Society in a truly voluntary capacity. (Applause).

The Meeting terminated at 7.20 p.m.

Informal Discussion

An informal discussion followed the Annual General Meeting, a report of which will be published in the February issue of the R.S.G.B. BULLETIN.

The informal discussion terminated at 7.45 p.m.

Presentation of Trophies

AT the conclusion of the informal discussion which followed the Annual General Meeting on December 12, 1958, the President (Mr. L. E. Newnham, B.Sc.) presented the following trophies and awards:

ROTAB	Mr. S. Leslie Hill (G8KS).
Founder's	Mr. G. M. C. Stone (G3FZL).
B.E.R.U. Receiving Rose Bowl	Mr. W. E. Wilkinson (B.R.S.20317).
N.F.D. Shield and Replica	Gravesend Radio Society.
N.F.D. Shield Miniature Replicas	Gravesend Radio Society. Oxford & District Amateur Radio Society.
Mitchell-Milling	Mr. P. W. Winsford (G4DC).
Edgware	Dorking & District Radio Society.
Houston-Fergus	Mr. D. Alexander (G3KLH/P).
Whitworth	Mr. D. A. G. Edwards (G3DO).
Metcalfe	Mr. M. Harrington (B.R.S.20249).
Miniature	Mr. F. A. Griffiths (GM3MED/P).
Bevan Swift Memorial Premium	Mr. G. Jessop (G6JP).

Mr. E. G. Ingram, GM6IZ (Scottish Zonal Representative) has agreed to present the Arthur Milne trophy to Mr. C. F. Sherrit (GM3EOJ).

The Wortley Talbot Trophy will be presented to Mr. A. L. Mynett (G3HBW) at the Society meeting to be held at the Institution of Electrical Engineers on January 23, 1959.

Miniature replicas of the B.E.R.U. Senior and Junior Trophies have been sent to Messrs. R. G. Henwick (ZS6DL) and J. C. van Wyk (ZS6R) winners of the B.E.R.U. Senior and Junior Contests respectively.

The Ostermeyer Trophy will be presented to S/Ldr. Railton (G8AB) when he next returns to England. All other trophies have been dispatched to the winners.

Appreciations

THE General Secretary wishes to thank those members at home and overseas who were kind enough to send the season's greetings to himself and to other members of Headquarters staff at Christmas time. The expressions of good will were greatly appreciated.

Overseas Subscription Rate

The Council give notice that as from April 1, 1959, the Overseas Corporate Subscription rate will be increased to £1.8.0 ($4.00 U.S.) per annum.

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, November 17, 1958, at 6 p.m.

Present: The President (Mr. L. E. Newnham in the Chair), Messrs. W. H. Allen, N. Caws, C. H. L. Edwards, D. A. Findlay, W. J. Green, F. Hicks-Arnold, J. H. Hum, E. G. Ingram, W. R. Metcalfe, A. O. Milne, A. C. Williams, E. W. Yeomanson (Members of the Council), Mr. John Clarricoats (General Secretary) and Mr. John A. Rouse (Deputy General Secretary).

Apologies: Apologies for absence were submitted on behalf of Messrs. H. A. Bartlett and W. A. Scarr.

Absent: Messrs. R. H. Hammans and H. W. Mitchell.

* * *

Zone A Vacancy

It was agreed that the procedure to be adopted for filling the Zone A vacancy which will arise when Mr. W. R. Metcalfe (G3DQ) retires from that office on December 31, 1958, shall be considered at the January 1959 meeting of the Council.

Reports of Committees

The Minutes of meetings of the Handbook Sub-Committee and of the Technical, Exhibition and TVI/BCI Committees were submitted as Reports.

Resolved to receive the Reports and to accept various recommendations contained therein.

The Recommendations dealt with the R.S.G.B. Radio Hobbies Exhibition.

Contest Log Sheets

Resolved to authorize an expenditure of £24 2s. 3d., plus carriage charges, on 10,000 contest log sheets and 4,000 contest cover sheets.

I.G.Y.

Report No. 4 of the I.G.Y. Co-ordinators was submitted.

Resolved to inform the I.G.Y. Co-ordinators that the Council approves the proposal that the present I.G.Y. programme, modified in the light of experience, shall be continued during the year 1959.

Membership

Resolved (i) to elect 66 Corporate Members and 15 Associates, (ii) to grant Corporate Membership to 5 Associates who had applied for transfer.

Application for Affiliation

Resolved to grant affiliation to the Southport Radio Society.

Mullard Award

It was reported that the terms and conditions governing the Mullard Award had been accepted by Mullard Ltd.

Technical Library

Further consideration was given to a suggestion made earlier in the year that the Council should establish a Technical Reference Library at Headquarters.

Resolved not to proceed with plans for the establishment of a Technical Library open to members.

The Secretary was instructed to obtain quotations for the provision of suitable storage accommodation for the Society's technical books in the Council Room at Headquarters.

London and Home Counties Mobile Group

Resolved (i) to authorize the Deputy General Secretary to take the necessary steps to bring the proposed London and Home Counties Mobile Group into being; (ii) to publicize the proposed Group on the Society's stand at the R.S.G.B. Radio Hobbies Exhibition.

I.A.R.U. Region I Secretarial Expenses

In answer to questions about Region I Secretarial expenses Mr. Clarricoats informed the Council that (i) a special Region I Fund exists for the purpose of paying for the cost of printing, stationery, postages, trunk calls, etc.; (ii) that expenses incurred by him in connection with his duties as Hon. Secretary, Region I Division, are charged against that Fund; (iii) that he has ample funds to meet administrative expenses; (iv) that most of the secretarial work relating to Region I Division will not be done in R.S.G.B. time.

South Atlantic Balloon Crossing

The Secretary reported upon discussions he had had with representatives of Siemens Edison Swan Ltd. and the *Daily Mail* concerning radio communication problems associated with a proposal to cross the South Atlantic by free balloon.

A meeting between all interested parties had been arranged for November 21, 1958, when it was hoped that a solution to the problems would be found.

The meeting terminated at 9.40 p.m.

Supplementary Report of the Council*

THE Report which follows refers briefly to some of the more important events and happenings that have taken place since the Society's financial year ended on June 30, 1958.

I.A.R.U. Region I Conference

The R.S.G.B. was represented at the I.A.R.U. Region I Conference held in Bad Godesberg, Germany, during July 1958, by the President (Mr. L. E. Newnham, B.Sc., G6NZ), the Executive Vice-President (Mr. W. R. Metcalfe, G3DQ) and the General Secretary (Mr. John Clarricoats, O.B.E., G6CL). The Deputy General Secretary (Mr. John A. Rouse, G2AHL) was present as an observer, while the Society's V.H.F. Manager (Mr. F. G. Lambeth, G2AIW) represented the R.S.G.B. at a meeting of I.A.R.U. Region I V.H.F. Managers which took place during the Conference period.

As reported upon in the Annual Report, the Council decided earlier in the year to nominate the General Secretary as a member of the I.A.R.U. Region I delegation to the Ordinary Administrative Radio Conference which is due to open in Geneva on August 17, 1959. Mr. Clarricoats' nomination was accepted by all the Societies represented at the Bad Godesberg Conference. He, together with Major Per-Anders Kinnman (SM5ZD), will lead the I.A.R.U. Delegation to Geneva.

During September 1958 the Council were advised that it may be possible for a representative of the R.S.G.B. to be included in the United Kingdom delegation to Geneva. The Council decided to put forward the name of Mr. L. E. Newnham, B.Sc. (G6NZ).

The Society's proposals in respect to frequency allocations have now been considered by various Government Committees, and it is anticipated that in general they will be included in the official United Kingdom "brief". The Society has proposed that the present frequency allocations for amateurs in the United Kingdom shall remain unchanged except for very minor amendments and additions.

Exhibitions

The Society was again represented at the National Radio Show held at Earls Court, London, during the end of August and early part of September. Much interest was shown in the Society's stand which aimed at providing information for the interested newcomer to Amateur Radio. More than 700 members of the Society signed the visitors' book and 60 new members were enrolled.

The Second Annual R.S.G.B. Radio Hobbies Exhibition, sponsored by the R.S.G.B., took place during November in the Old Hall of the Royal Horticultural Society, London. Support from the radio industry, the Services and book publishers, exceeded expectations. Paid attendances reached the satisfactory figure of about 9,800. The Exhibition was organized by Mr. P. A. Thorogood (G4KD).

The Council records its thanks to Mr. F. F. Ruth (G2BRH) who acted as Manager of the Society's stands at both Exhibitions. The Exhibition Committee and those members who performed stand duties are also thanked for their services.

International Geophysical Year

A report on the activities undertaken by members during the first 12 months of the International Geophysical Year appeared in the July 1958 issue of the Society's Journal. The good work then recorded has been continued under the able leadership of the I.G.Y. Co-ordinators (Messrs. G. M. C. Stone, G3FZL, and C. E. Newton, G2FKZ).

The Council has agreed to sponsor the continuation of the scientific programme which has been undertaken with so much enthusiasm by the I.G.Y. observers.

Official Regional Meetings

Successful Regional Meetings were held in Bridlington (September 21, 1958), Aberdeen (October 25) and Edinburgh (October 26). The Council was represented at all three meetings.

Mobile Rallies

Well supported Mobile Rallies were held in various parts of the country during the summer months, culminating in a large Rally at Woburn Abbey on September 14, 1958.

New Publications

New editions of the *R.S.G.B. Amateur Radio Call Book* and *A Guide to Amateur Radio* were published during the latter part of November. The preparation of material for the *Call Book* was undertaken in the main by Mr. W. J. H. Kempton (G8LN) and in the later stages by Headquarters staff. Mr. Pat Hawker (G3VA) was chiefly responsible for the preparation and editing of the material published in the new *Guide to Amateur Radio*.

The Council records its thanks to Mr. Kempton and Mr. Hawker for their invaluable assistance.

Mullard Award

The Council has been pleased to accept an offer of Mullard Limited to make an award each year to the member of the Radio Society of Great Britain resident in the United Kingdom who has, through the medium of Amateur Radio during the preceding calendar year, rendered outstanding personal service to the community by his own endeavours or by his own example of fortitude and courage. The first award will take place during April 1959. The Award will take the form of a gift in kind (preferably electronic or electrical apparatus and/or books) to the value of £25 and a plaque.

The Council records its thanks to the Directors of Mullard Limited for their generous offer.

** Read by the President to the members present at the Annual General Meeting held on Friday, December 12, 1958.*

A.R.R.L. International DX Contest

AMATEURS all over the world are cordially invited to take part in the 25th A.R.R.L. International DX Contest to be held during four weekends in February and March this year. The phone section will take place during the weekends of February 7 to 8 and March 7 to 8, and the telegraphy section during the weekends of February 21 to 22 and March 21 to 22. In all cases, the starting time is 00.01 G.M.T. on the first date and the finishing time 24.00 G.M.T. on the second date.

As in the past, certificate awards are offered to the top single-operator phone and c.w. scorers in each country. A special category recognizes multiple-operator stations in those countries from which three or more valid multiple-operator entries are received.

Log sheets are available on application from the A.R.R.L. Communications Dept., 38 La Salle Road, West Hartford 7, Conn., U.S.A.

B.E.R.U. CONTEST 1959

JANUARY 17-18

For rules, see page 240, November, 1958 issue.

Society News

Our New President

DR. R. L. SMITH-ROSE, C.B.E., who took office on January 1, 1959, as 25th President, will be formally installed by his predecessor (Mr. L. E. Newnham, B.Sc., G6NZ) at a meeting of the Society to be held at the Institution of Electrical Engineers, London, on Friday, January 23, 1959.

Dr. Smith-Rose was a member of the London Wireless Club in 1913 and a member of the Council of the Wireless Society of London (forerunner of the R.S.G.B.) shortly after the first world war. He was elected an Honorary Member on November 9, 1942.

Dr. Smith-Rose graduated at London University and, after a few years of practical experience in the electrical communication industry, joined the scientific staff of the National Physical Laboratory. In 1939 he became Superintendent of the Radio Division of the Laboratory and in 1948 was appointed Director of Radio Research in the Department of Scientific and Industrial Research with his main headquarters at the Radio Research Station, Slough.

Dr. Smith-Rose has conducted much research on the propagation of radio waves, direction finding and associated matters. He takes a very active interest in the international radio field and attends all the meetings of the International Scientific Radio Union (U.R.S.I.) of which he is a vice-president. He is also international chairman of one of the study groups of the International Radio Consultative Committee (C.C.I.R.) and national chairman of two of the study groups set up by the U.K. C.C.I.R. General Purposes Committee.

Dr. Smith-Rose holds the degree of Doctor of Science in the University of London. He is also a Doctor of Philosophy, a Fellow of the City and Guilds Institute, a Fellow of the Institute of Radio Engineers and a Member of the Institution of Electrical Engineers.

In 1947 Dr. Smith-Rose was awarded the U.S. Medal of Freedom with Silver Palms for his service in scientific research and development and for co-operation with U.S. scientists. In 1952 he was appointed a Commander of the Most Excellent Order of the British Empire.

Dr. Smith-Rose has for many years followed closely the activities of the Society and it was largely as a result of his inspiring article published in the R.S.G.B. BULLETIN that the Society's I.G.Y. programme took shape.

His many friends in the Society will join Headquarters staff in wishing him a very happy and successful year as President.

R.S.G.B. Radio Hobbies Exhibition

IN order to remove any misunderstanding, the Council wishes to make it known that the annual Radio Hobbies Exhibition is sponsored by the Radio Society of Great Britain and organized on its behalf by Mr. P. A. Thorogood.

Any suggestion that Mr. Thorogood has acquired the promotion rights is incorrect, as is any suggestion that the R.S.G.B. is no more than a supporting exhibitor.

Top Band Users—Take Heed

THE Danish Administration has again complained to the G.P.O. that harmful interference from United Kingdom Amateur Radio stations is being experienced at Skagen Radio, which operates on 1988 kc/s.

The G.P.O. has asked the Society to remind members of the necessity to avoid causing harmful interference to the operation of radio telephone communication between ships and shore stations.

Users of Top Band will remember that a similar reminder was published in the March 1958 issue of the BULLETIN.

It is understood that the G.P.O. have written to the licensees of the amateur stations which have been identified.

Bulletin Stencil Plates

IT occasionally happens that a stencil plate used for the preparation of a particular BULLETIN wrapper becomes worn or loses ink, with the result that the Post Office experience difficulty in tracing the address.

Members who notice that the address on the wrapper used for their copy of the BULLETIN is indistinct, or in any way faulty, are asked to advise Headquarters so that a new stencil plate can be prepared.

NOMINATIONS FOR THE FIRST MULLARD AWARD INVITED

THE terms and conditions governing the Mullard Award, are as follows:

(1) *The Award will be offered annually by Mullard Limited during the pleasure of the Directors of that Company.*

(2) *The Award will take the form of a gift in kind (preferably electronic or electrical apparatus and/or books) to the value of £25, and a plaque.*

(3) *The Award will be made to the member of the Radio Society of Great Britain resident in the United Kingdom who (in the opinion of a Committee consisting of three representatives of Mullard Limited and three representatives of the Council of the Radio Society of Great Britain) has, through the medium of Amateur Radio during the preceding calendar year, rendered outstanding personal service to the community by his own endeavour or by his own example of fortitude and courage.*

(4) *The presentation of the Award will take place during the month of April each year on a date and at a place to be decided by the Committee.*

(5) *In January of each year, the Radio Society of Great Britain shall, through its Official Journal, invite nominations for the Award. Each such nomination shall be supported by at least three Corporate Members of the Society and shall be accompanied by a brief factual account of the personal service rendered by the nominee.*

In accordance with Rule 5, the Council invites nominations for consideration for the first Mullard Award. Such nominations should be sent in writing to the General Secretary at R.S.G.B. Headquarters to arrive not later than February 14, 1959.

The President of the R.S.G.B. will make the Award for 1958 at a function to be held at Mullard House during April 1959.

Bulletin Wrapper Franking

LOXLEY BROTHERS LTD., who print the Society's Journal, state that for technical reasons and in order to avoid any possible hold-up at the Post Office, all wrappers are franked immediately on receipt, which is frequently before the copies are ready for the machines. Because of this system —which we understand applies to other publishers and printers—it is quite possible that if a date appears on the postmark it may be different from the actual date on which the Post Office collect the wrapped BULLETINS from the factory.

London Meeting
Friday, January 23, 1959
Presidential Address
by Dr. R. L. Smith-Rose, C.B.E.
at the
Institution of Electrical Engineers
Savoy Place, Victoria Embankment

Buffet Tea 6 p.m. **Lecture 6.30 p.m.**

R.S.G.B. Recorded Lecture Library

THE following are additions to the R.S.G.B. Recorded Lecture Library:

"Adventure in Tibet" by Robert Ford, ex-AC3SS/AC4RF (Recorded by the Barnet & District Radio Club).

"The Elements of Radio Valve Theory and Manufacture" by E. H. Chaudri, A.M.Brit.I.R.E. (G3DCS).

It is regretted that "Disc and Tape Recording" by H. A. M. Clark, B.Sc.(Eng.), M.I.E.E., (G6OT) has been damaged and is not at present available for loan to R.S.G.B. Groups and Affiliated Societies. "Radio Through the Years" by P. P. Eckersley, M.I.E.E., has also been withdrawn for re-recording.

Details of other tape lectures currently available can be obtained from the Hon. Librarian, Mr. F. H. Lawrence (G2LW), 78 Venner Road, London, S.E.26.

GB2RS SCHEDULE

R.S.G.B. news bulletins are transmitted on Sundays in accordance with the following schedule:

Nominal Frequency	Time G.M.T	Location of Station
3600 kc/s	10.00	London
	12.00	Yorkshire
145·55 Mc/s	11.15	Beaming south-east from Leeds
	11.30	Beaming south-west from Leeds
	11.45	Beaming north from Leeds
145·3–145·4 Mc/s	12.00	Beaming north from London area
	12.15	Beaming west from London area

Aden Call-signs

ABOUT 12 years ago the Society suggested to the Postmaster-General, Aden, that when call-signs were issued to amateur transmitting stations within his jurisdiction they should be in accordance with the following pattern:—

VS9A and another letter—Aden.
VS9K and another letter—Kamaran.
VS9P and another letter—Perim.
VS9S and another letter—Socotra.

This suggestion was implemented, but as a result only 26 call-signs were available for use in each of the four areas.

A high proportion of the amateurs in Aden are Service personnel or others who operate for a year or two at the most and then depart. In the past it has been the practice to leave the call-signs thus given up for at least a year before re-allocation.

It is common knowledge that an amateur prefers to have a call-sign personal to himself and not one that has previously been in use. In order to achieve this result it is understood that in future Aden amateurs will be issued with a call-sign consisting of VS9A and two other letters, an arrangement which will be welcomed everywhere.

Special I.T.U. Stamps now in use

AN arrangement was made in June 1958 by the Swiss P.T.T. Administration and the International Telecommunications Union that all official mail despatched from Union Headquarters, Geneva which was not machine-stamped, should bear special Swiss stamps. These stamps are now available in two series at 5, 10 and 40 centimes and at 20 and 60 centimes and 2 francs respectively. The designs symbolize the fundamental telecommunication principles of emission and reception.

A special post mark was used from the first day of issue (September 22, 1958) until the end of 1958.

Inquiries concerning these stamps should be addressed to the Stamp Collectors Department, P.T.T. Headquarters, Bollwerk 8, Berne.

Regional Meeting to be held in Blackpool

THE Council has agreed that an Official Regional Meeting shall be held in Blackpool on Sunday, April 12, 1959. The venue will be the Imperial Hotel. Tickets, price 15/- each, are available from the Town Representative, H. G. Newland (G5ND), 161 Penrose Avenue, Morton, Blackpool. Hotel accommodation may also be booked if desired.

Mr. Newland will be pleased to hear from members who would like a control station for mobiles to be in operation, or who would like the function combined with a mobile rally.

LONDON MEMBERS' LUNCHEON CLUB
will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,
at 12.30 p.m. on Friday, January 16 and February 20, 1959
Telephone table reservations to HOL 7373 prior to day of luncheon.
Visiting amateurs especially welcome.

GB3IGY Schedule

THE Society's beacon station GB3IGY on 145·5 Mc/s is in operation from 18.00 to 23.00 G.M.T. each day. In the transmissions, the word "NORMAL" indicates that there is no alert or Special World Interval; "ALERT ON" means that an alert or S.W.I. is in progress. The station is operated by Council member K. E. S. Ellis (G5KW).

Tests and Contests

Triple Tie on Top Band

FOR the first time, there was a triple tie for first place in the Second 1·8 Mc/s Contest which was held on November 7-8, 1958. Those three stalwarts of Top Band contests—I. T. Cashmore (G3BMY), W. W. Wells (G3HVX) and W. R. Steverson (G3JEQ)—each succeeded in amassing 140 points.

The number of entries was only slightly better than last year although scrutiny of the logs shows that many more stations were active. It is noticeable that a number of Top Band " regulars " took part but did not submit entries. To counteract this there was very welcome support from several recently licensed members. The only European stations active seem to have been DL1FF and DL1YA. G2FHF reported being called by a W (339) and later hearing a G calling W1BB.

Conditions seem to have varied from poor (with a high noise level) in the South to very good in Scotland and this probably accounts for the fact that GM stations could get no reply to calls to G stations which could be heard well up north.

Several members suggest an earlier start and finish for future contests; this will be considered by the Contests Committee before the rules for the 1959 event are settled.

Check logs, which proved exceedingly useful in judging such a close contest, are acknowledged with thanks from DL1YA, G2ZR, G3AKY, G3DXJ, G3KGU, G3KYU, G3MCY, G6ZT and G8PW.

Second 1·8 Mc/s Contest 1958

Posn.	Call-sign	Points	Posn.	Call-sign	Points
1.	G3BMY	140	31.	G3CWW	83
	G3HVX		32	G3KNU	82
	G3JEQ		33.	G3JNJ	81
4.	G3ERN	135		G3JVR	
5.	G6BQ	132	35.	G3DCZ	79
6.	G3KRC	121		G3HDZ	
7.	G3KLH	117		G6ZY	
8.	G3IIS	116		GW8PG	
	G3JWR/A		39.	G2AFV	75
10.	G3HES	112		GM3EDU	
	G3IAS		41.	G3ADZ	72
12.	G2DC	107	42.	G3FHN	70
	G3IGW			G3LCV	
14.	G3KOR	102	44.	G3MEH	69
	G3LJR		45.	G3MCD	65
	G8ON		46.	G2HPF	64
17.	G3LCH	101	47.	G3KTF	62
18.	G3GCD	100		G4BD	
19.	G3LVP	99		GM6IZ	
20.	G3JKY	96	50.	G2AVC	58
	G3LHJ		51	G3KPJ	57
22.	G3HTI	94	52.	GI3KYP	55
	GM3KHH		53.	G2DSF/A	53
24.	G3KAB	93	54.	G3KUG	52
25.	G2FHF	92	55.	G3JSN	50
	G3JFI	92	56	G3MGL	43
27.	G3MGS	90	57.	G3DOP	33
28.	G2MJ	89	58	G3ILO	20
29.	G3LRP	88	59.	G3GYD	9
30.	G3HQT	87			

First Top Band Contest 1959

THE rules for this contest, which will be " short," are as follows.

When: 21.00 G.M.T. on Saturday, February 21 to 03.00 G.M.T. on Sunday, February 22, 1959.

Eligible Entrants: All fully paid-up Corporate Members of the R.S.G.B. resident in G, GC, GD, GI, GM and GW.

Contacts: C.w. (A1) contacts only in the 1·8 to 2 Mc/s band.

Scoring: Contacts with stations in the British Isles (G, GC, GD, GI, GM and GW) will score *one* point only; contacts with stations outside the British Isles will score *three* points.

Contest Exchanges: RST reports followed by the contact number starting with 001. All reports must be acknowledged with " R."

Logs: (*a*) Must be tabulated in columns headed (in this order) " Date/Time G.M.T.," " Call-sign of station worked," " My report on his signals and serial number sent," " His report on my signals and serial number received," " Claimed Score."

(*b*) The cover sheet must be made out in accordance with R.S.G.B. Contests Rule 5. The declaration must be signed.

(*c*) Entries must be postmarked not later than **Monday, March 9, 1959.**

Power Input: The power input to the *final* stage or any preceding stage of the transmitter must not exceed 10 watts.

Awards: At the discretion of the Council of the R.S.G.B., the *Somerset Trophy* will be awarded to the winner and certificates of merit to the stations placed second and third. In addition, the *Maitland Trophy* will be awarded to the Scottish station with the highest aggregate number of points in this contest combined with the Second 1·8 Mc/s Contest 1958. A certificate of merit will be awarded to the non-transmitting member submitting the best check log in the opinion of the judges.

The General Rules for R.S.G.B. Contests published on page 348 of this issue of the *R.S.G.B. Bulletin* apply to the contest.

Low Power Contest 1958

LOW power communication, once so common on the amateur bands, is almost a thing of the past. Changing conditions have brought changes in values, and today, with the bands crowded to the limit, the term QRP is often applied to powers in excess of the licensed inputs of earlier days.

It is, therefore, heartening to find the old values upheld year after year in QRP contests by a number of enthusiasts who pit their puny "half-watts" most effectively against QRM from higher powered stations. Since the exchange of serial numbers is sufficient to induce a chain reaction amongst other operators, who frantically exchange numbers themselves without having any idea of the contest rules, those taking part in the Low Power Contest on October 4-5 suffered considerably from the well meaning but unwelcome participation of high power stations in the event. Despite this, stations in DJ, DL, EI, F, GD, GI, OE, OH, OK, and PA were worked by several contestants.

The winner, G. Weale (GW3LEW) used a Hartley v.f.o. running at 0·49 watt input and a 132 ft. end fed aerial to accumulate his score of 2,194; DJ, DL, EI and OE were amongst his " bag." V.H.S. Curling (G6VC), with 2,040 points, was runner-up. His equipment comprised a 6J5 v.f.o., a 6AC7 p.a., running mainly at 0·5 watt, and a 132 ft. aerial. G6VC had DJ, EI and PA contacts to his credit. Third was I. T. Cashmore (G3BMY) using an SP61 e.c.o. and one half of a 6J6 in the p.a., with an input of 0·45 watt. The aerial was a 135 ft. Zepp.

Receivers and valves were varied, the latter being mainly low power types, although the inevitable 807 did creep in, but the aerial favoured by most was the end-fed with a length between 100 and 150 ft.

The Contests Committee would like to thank all competitors for the exceptionally high standard of the entries which made checking a pleasure, and G3KAB for submitting a check log.

Posn.	Call-sign	Points	Posn.	Call-sign	Points
1	GW3LEW	2194	10	G3CGD	1036
2	G6VC	2040	11	G3KLT	973
3	G3BMY	2020	12	G6GH	900
4	G5LQ	1437	13	G3KLH	815
5	G3LHJ	1417	14	G3JKY	790
6	G2DC	1188	15	G3LWQ	420
7	GW2CAS	1178	16	G3BY	360
8	G4JW	1123	17	G3CWL	310
9	G3KVG	1110			

Second 70 Mc/s Contest 1958

AS a result of the G.P.O. decision to allocate the 70 Mc/s band to amateurs on a year-to-year basis, more interest was shown in the second 70 Mc/s contest held during the weekend of November 16-17. Four entries were received, and it was very encouraging to see an entry from a GW station. From the contacts made, it is known that at least five other Gs and one GW station were active and it is to be hoped that they will be encouraged to submit entries

next time. Conditions were not as good as those prevailing during the first contest, and the best DX contact was between F9CZ (Montereau, Seine et Marne) and G5MR (Hythe). Other French stations known to have been active were F8GH, F8LO, F8MW, F8QL, F9CZ, F9EA and F9IW, but no FA stations were reported.

The event was won, once again, by Vernon Mellor (G5MR) of Hythe, Kent, with a score of 1,246 points. Second was B. W. F. Mainprise (G5MP), also of Hythe, with a score of 278 points. Both stations used the same equipment as in the first 1958 contest.

These results mean that in 1958 Kent had absolute command on the 70 Mc/s band; perhaps London and provincial stations will rise to the challenge in 1959.

Position	Call-sign	Points
1	G5MR	1,246
2	G5MP	278
3	G3MLS	51
4	GW3MFY	40

Arthur Watts Trophy

ACTING on the advice of the Contests Committee, the Council has decided to make no award of the *Arthur Watts Trophy* for the year 1958.

144 Mc/s C.W. Contest 1959

NON-TRANSMITTING members are reminded that a certificate of merit will be awarded to the sender of the best check log received in connection with the 144 Mc/s C.W. Contest to be held on Saturday, January 24, 1959.

Contests Diary

1959

January 17-18	-	B.E.R.U. Contest[1]
January 24	-	144 Mc/s C.W. Contest[2]
February 7-8	-	Affiliated Societies' Contest
February 7-8	-	A.R.R.L. DX Contest (Phone Section)
February 21-22	-	A.R.R.L. DX Contest (C.W. Section)
February 21-22	-	First (Short) 1·8 Mc/s Contest
March 7-8	-	A.R.R.L. DX Contest (Phone Section)
March 7-8	-	144 Mc/s Open Contest[3]
March 21-22	-	A.R.R.L. DX Contest (C.W. Section)
March 21-22	-	1250 Mc/s Tests
April 11-12	-	Low Power Contest
April 26	-	D/F Qualifying Event
May 3	-	First 144 Mc/s Field Day (c.w. only)[3]
May 10	-	D/F Qualifying Event
May 24	-	420 Mc/s Contest
June 6-7	-	National Field Day[4]
June 20-21	-	First 70 Mc/s Contest
June 28	-	D/F Qualifying Event
July 5	-	Second 144 Mc/s Field Day[3]
July 12	-	D/F Qualifying Event
September 5-6	-	National V.H.F. Contest and European V.H.F. Contest[3]
September 20	-	Low Power Field Day
September 27	-	R.A.E.N.
November 7-8	-	Second 1·8 Mc/s Contest
November 21-22	-	R.S.G.B. Telephone Contest

[1] For details, see page 240, R.S.G.B. *Bulletin*, November, 1958.
[2] For details, see page 294, R.S.G.B. *Bulletin*, December, 1958.
[3] These contests are arranged to take place during the periods suggested by the Region 1 V.H.F. Committee.
[4] For rules, see page 294, R.S.G.B. *Bulletin*, December, 1958.

General Rules for R.S.G.B. Contests

THE following rules apply to all R.S.G.B. Contests and are to be read in conjunction with the details for each individual contest published in the R.S.G.B. BULLETIN.

Rule 1. **Entrants** must operate in accordance with the terms of their licences.

Rule 2. **Unlicensed Stations.** Contacts with unlicensed stations will not count for points. Proof of contact may be required.

Rule 3. **Contest Exchanges.** An exchange of RST or RS reports followed by a three figure serial number starting with 001 for the first contact and increasing by one for each successive contact (i.e. 559001 or 58001) must be made before points can be claimed. All reports must be acknowledged. In the case of **v.h.f./u.h.f. contests,** the location and band identification letter (A for 144 Mc/s, B for 420 Mc/s and C for 1250 Mc/s) must also be exchanged. The location must be in distance and direction from the nearest town easily found on a map (i.e. 559A001 10E Oxford or 56A001 10W Cambridge).

Rule 4. **Contacts.** Only one contact on each band may be made with a specific station, whether fixed, portable, mobile or alternate address. Duplicate contacts must be logged and clearly marked as duplicates without claim for points. Cross-band contacts may not be claimed. (This rule may be subject to variation in certain contests and reference should be made to the published details).

Rule 5. **Entries** must be clearly written or typed ON ONE SIDE ONLY of R.S.G.B. contest log forms or on foolscap or quarto paper and must be set out in the form prescribed in the published details for the contest concerned. The cover sheet of an entry must be made out in the following form and all the information filled in:

Contest.....Date.....Claimed Score.....

Section (if any).....Call-sign.....

Name .....

Home address .....

Address of Station or Portable Location } (where applicable—see contest details)

National Grid Six Figure Reference (or Lat. and Long. or County Code number) } .....

Transmitter.....Power input.....watts

Receiver..... Aerial(s).....

DECLARATION: I declare that this station was operated strictly in accordance with the rules and spirit of the contest, and I agree that the decision of the Council of the R.S.G.B. shall be final in all cases of dispute. I certify that the maximum input to the final stage of the transmitter was.....watts.

Date..... Signed.....

Failure to sign the declaration may involve disqualification of the entry.

Rule 6. **Submission of Entries.** Entries must be addressed to the Contests Committee, Radio Society of Great Britain, New Ruskin House, 28-30 Little Russell Street, London, W.C.1, England, and must be postmarked not later than the date stated in the published details governing the contest concerned. The name of the contest must be clearly shown at the top left-hand corner of the envelope. All entries become the property of the Radio Society of Great Britain.

Rule 7. **Multiple Operator Entries.** Unless otherwise stated, single operator entries only will be accepted. In those contests where multiple-operator entries are allowed, such entries will only be accepted provided that:

(*a*) The call-sign and signature of the operator concerned is recorded for each contact.
(*b*) The declaration is signed by only one operator who will be regarded as the entrant.

Rule 8. **Portable stations** must operate from the same site for the duration of a contest. Power must not be derived from public or private supply mains. No apparatus may be erected on the site prior to the day of the event. For the purposes of R.S.G.B. contests, **mobile stations** are stations installed in motor vehicles or vessels on inland waterways and so equipped that they are capable of operation in motion without any alteration.

Rule 9. The details relating to specific contests published in the *R.S.G.B. Bulletin* shall be regarded together with these general rules as the rules of the contest.

Rule 10. In the event of any dispute, the ruling of the Council of the Radio Society of Great Britain shall be final.

Rule 11. **Check logs** submitted by non-transmitting members for consideration for the award of certificates of merit should give in this order the following details: Date, Time (G.M.T.); Band; Call-sign of station heard; His report and serial number sent; Call-sign of station being worked.

Letters to the Editor . . .

Neither the Editor nor the Council of the Radio Society of Great Britain can accept responsibility for views expressed by correspondents.

Design for an S.S.B. Driver

DEAR SIR,—I have noted the various articles on s.s.b. driver construction in the BULLETIN, and have noticed that in most cases operation is possible only on 80 and 20m, unless switched crystals or v.f.o. ranges are used. I have for some time been working on an all-band s.s.b. driver using only one crystal and one v.f.o. range. I am unable temporarily to finish the unit off and give full details, but, as it looks promising, members may be interested in the heterodyning frequencies involved.

Briefly, I tried to find a combination that would give a low variable frequency for good stability, a reasonable frequency for generating the s.s.b. signal, one crystal and a minimum number of its harmonics, and the least possible number of "birdies." With some surprisingly extensive calculations, the best combination I have found is given in Table I. The crystal is on 4·4 Mc/s and its fundamental, third and fifth harmonics are used. The second harmonic at 8·8 Mc/s is turned into an s.s.b. signal at this frequency—in my case by a phasing system. The basic range of the v.f.o. is 5·9 to 8·4 Mc/s; to spread the bands over the tuning dial I switch padding capacitors in the v.f.o. circuit, but this is not essential. The v.f.o. range can be further reduced if the full range of the 28–30 Mc/s band is not required, but then a slightly different crystal frequency is preferred. It will be noted that only in the 10m band is there any chance of a "birdie" from the v.f.o., when the fourth harmonic could give trouble. Suitable screening and the use of balanced mixers in both cases should stop trouble here. Finally it should be noted that the particular sideband obtained at the output varies from band to band and an extra switch wafer on the band-change switch must be used to reverse connections in the s.s.b. section to maintain the same sideband finally.

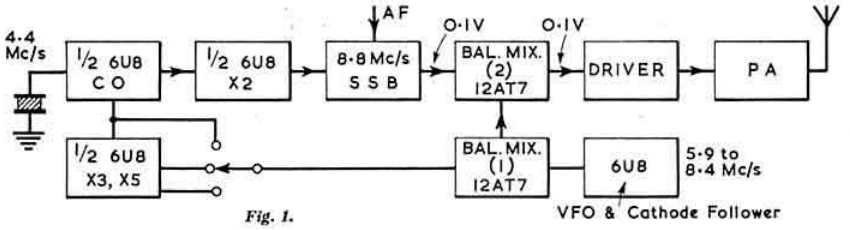


Fig. 1.

The block diagram (Fig. 1) shows the circuit as it is being built. Readers who have crystals in the 4·3 to 4·7 Mc/s range can all produce similar tables depending on which bands they want to operate. A useful selection chart is also given in *G–E Ham News* for November 1956, but this is not primarily for all-band operation.

Yours faithfully,

St. Laurent, P.Q., Canada. M. BARLOW (ex-G3CVO).

Table I

V.F.O. tunes	Beats with crystal harmonic	To give at output of Mix 1	Which beats with 8·8 Mc/s s.s.b. to give	Relative sideband
6·1–6·4 Mc/s	4·4 Mc/s × 1	10·5–10·8 Mc/s	1·7–2·0 Mc/s	Upper
7·9–8·4	4·4 × 1	12·3–12·8	3·5– 4·0	Upper
6·2–5·9	22·0 × 5	15·8–16·1	7·0– 7·3	Lower
8·0–7·7	13·2 × 3	5·2– 5·5	14 –14·3	Lower
7·8–8·2	22·0 × 5	29·8–30·2	21 –21·4	Upper
6·0–8·0	13·2 × 3	19·2–21·2	20 –30	Upper

Note that in all cases the mixer input and output frequencies are well separated.

Some Thoughts from New Zealand on S.S.B.

DEAR SIR,—Dr. A. H. Koster's article "Some Thoughts on S.S.B." in the R.S.G.B. BULLETIN for August 1958, certainly has given many of us food for thought. At first we wondered, was this another leg-pull similar to the Larsen E. Rapp's classic on the buried antenna (April 1957 *QST*) but lively discussions on the 80m band here in New Zealand brought forth the opinion that the writer was serious. It is on this assumption, therefore, that I pen these notes.

Before taking Dr. Koster's points one by one, let me say that certain of his statements are undoubtedly true. There are, of course, some aspects of s.s.b. which call for improvement and he would indeed be a biased enthusiast if he did not admit that fact. However, Dr. Koster does not set out to compare s.s.b. with say a.m. or f.m. (or even c.w.) which is the only way one may assess its worth, but he systematically condemns the whole technique. Even this, where there is fact behind the condemnations, would be understandable but anyone who normally operates s.s.b. will have realized in but a few minutes that Dr. Koster's receiving set-up must be of the crudest and that he is uninformed about present day techniques.

His question "Is s.s.b. here or not here?" and the way he attempts to show us that it is not, is indeed laughable. I wonder does he ever tune the top end of 20m? Does he know, for example, that there are now amateurs in more than one hundred countries operating s.s.b. on that band alone, and that quite a few ZLs have worked more than one hundred countries on two way s.s.b. on that and other bands?

Dr. Koster's next point concerns the reception of s.s.b. and in this there is perhaps a lot of merit. It is obvious that unless an amateur is able to receive s.s.b. he will not be able to work stations using that system, neither will he know what countries there are to work.

Dr. Koster remarked in his article that "usually the beginner manages to get a station tuned in just in time to hear him sign off or go over to the other stations. One would expect the replying station to come up on the same frequency but he often does not. A few cycles off tune are enough to upset the adjustment completely and the weary procedure has to start all over again." Does Dr. Koster not know that it is common practice to follow both sides of a voice-controlled contact when one station is in the American 'phone band and the other out of it?

Further on in his article, under the heading "Possible Solutions," Dr. Koster points out again that it is unreasonable to ask a station to turn down the r.f. again, turn off the a.v.c. or make whatever adjustments that are necessary to the receiver. Why is it unreasonable to expect an operator to do these things? He must in any case do many of them if he wishes to copy c.w. Surely Dr. Koster does not expect us to "tailor" the s.s.b. to fit his receiver!

An important point missed by G3ECA is that s.s.b. is an advancement of techniques. You don't *have* to use s.s.b.—you may continue using a.m. if you wish—but you must be tolerant towards others using it. Surely, the s.s.b. enthusiast, in helping to develop a technique which is head and shoulders above a.m. in the technical sense (and that no one can deny), is doing something worthwhile. If a person *wants* to receive s.s.b. but his set will not do the job properly then he should find out what to do. He certainly should not condemn others for lack of information!

I wonder whether it is because of adverse propaganda, such as that written by Dr. Koster, that so few G stations are heard using s.s.b.? Where is the spirit and foresight which put Britain away ahead of the United States even in the development of radar? Congratulations Mr. Editor on your futuristic outlook and to Dr. Koster for having made the point concerning the reception of s.s.b. Perhaps we shall get more articles on that subject.

Yours faithfully,

Warkworth, LESTER A. EARNSHAW

New Zealand. (ZL1AAX).

P.S.—Approximately 70 New Zealand stations are using s.s.b. at the present time.

Single Sideband Reception

DEAR SIR,—Why this condemnation of s.s.b. reception, particularly by Dr. Koster (G3ECA)? Can it be because no member of Council, with perhaps one exception, and no one at Headquarters, uses this method of communication?

Reception of s.s.b. signals is not all that difficult on unaltered receivers and the knack of using slow tuning methods of the receiver and the b.f.o. is quickly learnt. I have been using an HRO, a BC348 and an Eddystone 640 unaltered for the best part of a year for s.s.b. reception. I know that an AR88 works just as well, but I agree that if the full r.f. gain of the receiver is to be used then a product detector gives the best reception on s.s.b. signals. I repeat, however, that these receivers will easily receive readable s.s.b. signals without alteration.

Yours faithfully,
R. F. G. THURLOW (G3WW).

Wimblington, near March,
Cambs.

Interference to Cinema Sound

DEAR SIR,—I have recently been troubled with breakthrough into the sound track of a local cinema and it may interest other members to hear of the results of the work carried out in conjunction with the cinema sound engineer and the Post Office.

The trouble appeared chiefly during operation on 10 metres but was also audible when the transmitter was on 15 metres. It was obviously caused by something within the cinema resonating and re-radiating but repeated efforts to locate the offending circuit were to no avail. Each time an apparent cure was found the trouble would recur again after a period of a few weeks.

Eventually it was decided that the amplifier must be attacked and all the usual remedies were tried—grid stoppers and bypass capacitors were installed in all the usual places without success. The P.O. then suggested small chokes which had been used successfully in TVI cases in South London. However, the only success we achieved was in reducing the output of the sound track!

The main earth for the equipment was to a rising water main but this was very long and standing waves at 28 Mc/s were found on the pipe. Removing the main earth connection made no difference either way.

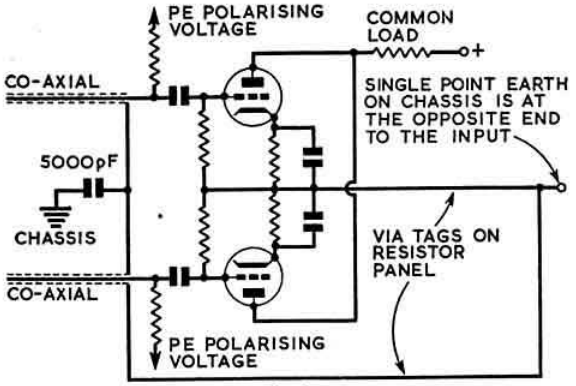


Fig. 1.

It was then decided to try earthing to an antinode point on the pipe. A length of twin flex with crocodile clips at one end was used for this test: one end was clipped to the amplifier and immediately the interference ended! On investigation we found that the two ends had been clipped to different points, both of which were supposed to be at earth potential, as shown in Fig. 1. Both were earthed, one to the chassis, the other to the outer of the coax cable from the photo-electric cell. Trying various capacitors across the same points proved that something over 500 pF had a beneficial effect, the final value used being 5000 pF. This appears to cure the trouble for both 10 metres and 15 metres operation.

Earthed points are evidently not always what they seem! A single point earth on an amplifier may be good for a.c. hum but not necessarily for r.f.

Yours faithfully,
Ruislip, Middlesex. FRANK FLETCHER (G2FUX).

Double Sideband Reduced Carrier

DEAR SIR,—Referring to the letter from Mr. Ripley (G3KFW) in the December issue of the BULLETIN, I wish to point out that double-sideband reduced carrier emission is not designated by "A3b." This refers to independent sideband reduced carrier emission, *i.e.*, two separate intelligence-bearing sidebands at the same (reduced) carrier frequency generated in the same transmitter.

Double sideband reduced carrier is merely a special case of A3 where the modulation percentage is allowed to exceed 100 per cent—but in a linear manner which does not generate distortion products in the manner of a conventional overmodulated A3 transmitter.

Double sideband reduced carrier possesses some of the advantages of A3a but requires even more specialized receiving methods. The reason is that the reinserted carrier at the receiver needs to be inserted with no frequency error at all, and *in phase* with that suppressed at the sender. Alternatively, a selective s.s.b. receiver may be used to reject one sideband and receive it as s.s.b.

Yours faithfully,
Ironbridge, Salop. G. C. BAGLEY (G3FHL).

Missing Half the Fun

DEAR SIR,—Of course every man's hobby is his own business and really only subject to his own dictates as to policy, but I do think that G3CMJ (July 1958 BULLETIN) is missing half the fun in ham radio. At least I find that the pleasure of a QSO is doubled upon receipt of a QSL. I believe that my QSL policy is like that of most amateurs. I QSL upon request and I QSL each rare or special QSO. But most important, I QSL every card I receive, whether ham or S.W.L. That is only common courtesy. If I felt that I lacked time or interest in QSLing all cards received, I would QRT. I am glad to report that I have never worked a ham with G3CMJ's strange attitude.

Sincere 73,
Los Angeles, California. JACK D. CLEMENT (W6NYR).

Council Election 1959

DEAR SIR,—Following the recent declaration of the results of the election for members of Council, I should like to take the opportunity through your columns of expressing my thanks to those who gave me their support, and to assure them that I shall be in the fight again in 1959 and once again looking for their backing in my efforts to get representation on Council for the many younger members of the Society.

Yours faithfully,
RAYMOND C. HILLS, B.Sc.(Eng.) (G3HRH).

Welwyn Garden City,
Herts.

DEAR SIR,—I should like to thank the 315 members who voted for me in the recent Council Election and to assure them that I appreciate their support. My only comment is the old one—why is it that so very few vote when the opportunity is given them? While writing, may I thank all those who worked my son GW3LXI while he was in hospital during October? I can assure them that it gave him much encouragement. The most striking thing was the way the spot on the band cleared when he called from hospital so as to give him every chance of a good QSO. The old Ham Spirit still exists.

Yours faithfully,
Pembroke, S. Wales. G. COURTENAY PRICE (GW2OP).

G3FBA says "Thank You"

THE Zone D Representative on the Council, Mr. W. J. Green (G3FBA) of Bath, who is also the QSL Sub-Manager responsible for the series G3EAA-G3HZZ, wishes to thank all those who sent him seasonal greetings at Christmas and the New Year. The number was far too numerous for him to acknowledge individually.

Regional and Club News

Brentwood.—Fortnightly meetings are now held at The Hermitage, Chelmsford, the next being on January 21 at 7.30 p.m. Further details may be obtained from the *Town Representative:* R. A. E. Fronius (G3MCW), 169 Coxtie Green Road, Brentwood, Essex.

Bristol.—About 45 members attended the December meeting when E. J. Harris (Bristol Aircraft Ltd.) gave a talk on telemetry. Equipment used to transmit information from guided missiles was demonstrated and some of the methods employed for receiving and recording such information described. The following have been elected to serve on the local committee during 1959: K. J. Creamer (B.R.S. 10167), W. J. Dear (B.R.S. 19985), H. J. Gratton (G6GN), G. C. Manning (G2IK), D. V. Newport (G3CHW) and D. Stephenson (G3KUL). R. E. Griffin (G5UH) was re-elected *Hon. Auditor* and D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, Bristol, *Hon. Secretary/Treasurer.* Details of future meetings are given in *Forthcoming Events.*

Cornish Radio and Television Club.—The December meeting was held in Falmouth when the President, Ron Penrose, gave a lecture on radio equipment for metereological purposes, and G3AET (County Controller) spoke about R.A.E.N. procedure. A club net is held on 3·6 Mc/s every night. *Hon. Secretary:* J. Brown (G3LPB/T), Marlborough Farm, Falmouth.

Grafton Radio Society.—A bumper Christmas Junk Sale was held on December 19. On January 16, E. J. Alban (G3JEA) will give a talk on " Measurements in the Ham Shack "; on the 30th P. F. Cundy (G2MQ) of the M-O Valve Co. Ltd. will discuss " Aspects of Valve Manufacture." F. C. Judd (G2BCX) is to speak about " Stereophonic Recording and Reproduction Techniques " on February 13. *Hon. Secretary:* A. W. H. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

Halifax and District Amateur Radio Society.—Recent events have included talks on crystal microphones and fault finding and a dinner on January 2. *Hon. Secretary:* A. Robinson (G3MDW), Candy Cabin, Ogden, Halifax.

Lothians Radio Society.—At the December meeting the Automobile Association's Radio Communications System was the subject of the lecture. On January 22 there will be a film show including *Mirror in the Sky* and two films on transistors. On February 5 a talk will be given on Air Traffic Control. Meetings are held at 25 Charlotte Square, Edinburgh, commencing at 7.30 p.m. and all local radio amateurs and shortwave listeners are invited to attend. *Hon. Secretary:* L. Lumsden, 33 Hillview Drive, Edinburgh 12.

Purley and District Radio Club.—Meetings are held at the Railwaymen's Hall, Whytecliffe Road, Purley, the next being on January 16 at 8 p.m. when there will be a talk on " The Product Detector " with demonstrations.

Surrey Radio Contact Club.—The Annual Dinner is to be held at the Greyhound Hotel, Croydon, on Friday, January 30. Tickets, price 16s. 6d. each, may be obtained from the *Hon. Secretary:* S. A. Morley (G3FWR), 22 Old Farleigh Road, Selsdon, South Croydon.

Slade Radio Society.—G. C. Simmonds was elected President of the Society at the 24th A.G.M. held on November 21, in succession to C. H. Young (G2AK). P. M. Williams and J. A. Walley are Chairman and Vice-Chairman respectively. Charles Smart was re-elected Hon. Secretary. The Technical Secretary is T. J. Hayward (G3HHD).

Hampshire C.R. Ballot

THE result of the ballot for the election of a County Representative for Hampshire and the Isle of Wight was as follows:

Mr. D. Metcalf (G3GHQ)	11 votes
Mr. L. Southworth (G3JLS)	3 votes

Representation

THE following are additions to the list of County (or District) Representatives published last month:

REGION 3—STAFFORDSHIRE.
C. D. BARLOW (G3HGI) " Domus," Moss Grove, Kingswinford, Brierley Hill.

REGION 7—LONDON EAST.
J. J. HOLLINGTON (G4GA), 1 Templeton Avenue, South Chingford, London, E.4.

REGION 17—HAMPSHIRE.
D. METCALF (G3GHQ), 80 King's Road, Southsea, Hants.

* * *

The following are additions to the list of Town (or Area) Representatives published in the December 1957 issue:

Region 5—Bedfordshire.
Bedford. B. E. Gee (G3LDG), 12 West Grove.

Region 10—*Glamorganshire.*
Penarth. V. J. T. Weale (B.R.S. 22101), 25 Dyserth Road.

Correction

The address of the County Representative for Northamptonshire is 36 Waterloo Road, Peterborough, and not 34 West Parade, Peterborough, as published in the December 1958 issue.

Can You Help?

● T. C. Bickerton (B.R.S. 21320), 40 Downend Road, Horfield, Bristol 7, who requires an instruction manual for the Phillips type P.C.R. Communications Receiver ZA.26707?

R. Signals Competition

Mr. C. T. Wakeman (G4FN) was the winner of the first prize in the competition organised by No. 1 S.C.R., Royal Signals (T.A.), at the R.S.G.B. Radio Hobbies Exhibition. His guess that the jar contained 10,891 peas was only 2 short of the actual total of 10,893. Mr. D. J. Andrews (G3MJX) was second. A list of the 12 winners with the prizes they won can be obtained from Lt.-Col. E. W. Milner, 79-85 Worship Street, London, E.C.2.

WELL DONE GRAFTON!

At Montem School, Hornsey Road, London, N.7, on December 5, 1958, London County Councillor Mrs. Hazel Rose, LL.D., presented certificates to 17 of the 26 successful candidates trained under the auspices of the Grafton Radio Society, who entered for the May 1958 City and Guilds Radio Amateurs Examination. A vote of thanks to Mrs. Rose was proposed by the General Secretary of the R.S.G.B. who later in the evening gave a talk on Amateur Radio. In this picture Mr. Clarricoats and Mr. S. H. Iles, G3BWQ (instructor)—third and fourth from left in centre row—are seen with some of the certificate winners.

New Members

THE following were elected to membership at the November 1958 meeting of the Council.

Corporate Members, Home (Licensed)

G2HFD †H. S. Reeve, 24 Belmont Hall Court, Belmont Grove, London, S.E.13.
G3CMU †H. A. Meyers, 19 Norrice Lea, London, N.2.
G3GEW †F/O H. Jordan, Officers Mess, R.A.F. Norton, Sheffield 8.
G3KOB R. V. Goodman, 14 Wyatt Park Road, Streatham Hill, London, S.W.2.
G3KZW R. B. Ratcliffe, 41 Booths Brow Road, North Ashton, near Wigan.
G3LTQ D. L. Schultz, Tudor Cottage, East Road, Weybridge.
G3MGA *P. E. Gillett, 45 Thorn Lane, Bradford 9.
G3MMY B. A. M. Ross, Homleigh, Battlebarrow, Appleby, Westmorland.
G3MQU R. M. W. Rash, Grey Gables, Wortham, Diss, Norfolk.
G3MWO D. A. Beales, 108 Rosemary Road, Clacton-on-Sea.
G3MWT F. E. Chittenden, 7 Grosvenor Close, Loftin Way, Chelmsford.
G3MXF P. J. Cutler, 9 Churchfield Crescent, Poole, Dorset.
G3MXM F. G. Wilkins, 69 Oldfield Road, Westbury, Wilts.
G3NBE S. G. Hoar, 81 Five Mile Drive, Oxford.
G3NBN *R. J. Weaving, 46 Talbot Street, Hazel Grove, Stockport.
G3NDD A. K. Tunnah, 16 Louvaine Avenue, Barrow Bridge, Bolton.
G3NDI C. R. Fry, 60 Bills Lane, Shirley, Solihull, Warwicks.
G8FF †S. Southgate, Robin Hill, Kingsmill Lane, Painswick, Stroud, Glos.
GC3LYC T. J. de Putron, Green Acres, Les Hubits, St. Martins, Guernsey.
GM3HWN †L. R. Turnbull, 1 Central Drive, Stenhousemuir, Larbert, Stirlingshire.
GM3MRV G. W. Carrick, Derwent, Sprouston Road, Kelso, Roxburghshire.
GM3NCS D. H. M. Noble, c/o 13 Drumgrain Avenue, Methuen, near Perth.
GM8NW †R. S. Wood, c/o Counties Relay Ltd., Hall Place, Galashiels.
GW2XZ †L. W. Hancock, Augusta Cottage, Raisdale Road, Penarth, Glamorgan.

Corporate Members, Overseas (Licensed)

K2FF Harold C. Vance, 33 Oakview Avenue, Maplewood, New Jersey.
K2HPN S. C. Fordham, Jr., Delmar Game Farm, Delmar, New York.
K2HLK Art Ballerini, 17-11 Elliott Terrace, Fair Lawn, New Jersey.
K8IRU Frank Parker, 8306 Navy Avenue, Detroit 9, Michigan.
EA7ID J. G. Perez de Guzman, Hacienda Torrequemade, Bollullos de la Mitacion, Sevilla, Spain.
VE1ABM S. I. Harrison, 91 Harbour View Drive, Sydney, Nova Scotia.
VE7AFG N. Baird, 218 Prideaux Street, Nanaimo, British Columbia.
VK2AZN I. L. Pogson, c/o Bank of New South Wales, Kingsway, London, W.C.2.
VP8DS A. L. Hardy, P.O. Box 185, Port Stanley, Falkland Islands.
VS9AO R. D. Pearson, Saltpans, R.A.F. Khormaksar, B.F.P.O. 69.
W2STM J. Z. Schanker, 161 Fenimore Street, Brooklyn 25, New York.
W2UWD R. D. Turrell, 133 Crestmont Road, Binghampton, New York.
W3NCF M. Scott Hunter, 718 Carl Avenue, New Kensington, Penna.
W6RB Frank Young, 258 East 29 Street, Los Angeles 11, California.
W7QNI Paul A. Wolf, Box 841, Redmond, Oregon, U.S.A.
W0ITO J. E. Groll, 3147 South 46th Street, Kansas City 6, Kansas.
ZL3RK T. J. McKenzie, 73 Cygnet Street, Christchurch, New Zealand.
ZS1R E. H. Rhodes, Sunnyside, Summerley Road, Kenilworth, Cape, South Africa.
ZS6ABL D. J. J. Viljoen, P.O. Box 252, Nelspruit, Tul, South Africa.
9G1CT Ivor Davies, P.O. Box 303, Sekondi, Ghana.

Corporate Members, Home (British Receiving Stations)

22063 M. W. Matthews, Matcham's Farm, Hurn Road, Ringwood, Hants.
22064 M. J. Holmes, 6 Antigua House, Hillsley Road, Paulsgrove, Portsmouth.
22065 †W. J. Cowan, 78 High Street, Dunbar, East Lothian.
22066 D. Lucas, Pen-y-Bryn Stores, Pen-y-Bryn, Hengoed, Glam.
22067 J. H. Hughieson, c/o R.N. W/T Station, Scarborough.
22068 J. G. Clewes, School House, North Rode, near Congleton, Cheshire.
22069 H. Friberg, 9 Northumberland Avenue, Newbiggin-by-Sea, Northumberland.
22070 B. R. Smith, Anvil Corner, 1 Belle Vue Road, Herne Bay, Kent.
22071 J. J. O'Donnell, 10 Abercorn Street, Paisley, Renfrewshire.
22072 E. M. Stables, Manor Farm, Hemingbrough, Selby, East Yorks.
22073 W. R. Gowans, 11a Hares Chase, Billericay, Essex.
22074 A. Edwards, 161 Clapham Park Road, London, S.W.4.
22075 A. J. Watkins, 75 Moat Road, Langley, Birmingham, Warwicks.
22076 J. McArthur, 51 Tiln Lane, Retford, Notts.
22077 W. H. Brownson, 176 Northumberland Avenue, Hornchurch, Essex.
22078 L. G. Calvete, 31 Beehive Lane, Welwyn Garden City.
22079 W. T. G. Hickman, 71 Bramley Crescent, Sholing, Southampton.
22080 D. Cowling, 44 Ashdown Avenue, Scunthorpe, Lincs.
22081 A. R. Bradford, 23 York Road, Bowdon, near Altrincham, Cheshire.
22082 B. J. Hall, 385a Bishport Avenue, Bristol 3.
22083 G. H. H. Coulson, 25 Spital Terrace, Gainsborough, Lincs.
22084 D. J. Perrett, 101 Burchells Green Road, Kingswood, Bristol.
22085 *D. S. Froome, 39 Manor Way, Egham, Surrey.
22086 *A. Ellerington, 23 Priors Road, Tadley, Basingstoke, Hants.
22087 *D. V. G. Bishop, 96 Rickmansworth Road, Watford.

Corporate Members (British Empire Receiving Stations)

997 J. Walton, P.O. Box 1580, Bulawayo, Southern Rhodesia.
998 O. Fuad, Police D. H.Q., Limassol, Cyprus.

Corporate Member (Foreign Receiving Station)

298 M. G. Magnier, 9ter Avenue du 11 Novembre, Meudon-Bellevue, Seine-et-Oise, France.

Associates

1756 A. J. Heath, 241 Browns Lane, Allesley, Coventry.
1757 W. G. Rattray, 17 Bannercross Drive, Garrow Hill, Baillieston, Lanarks.
1758 C. R. Blackmur, 162 Broadlands Avenue, Enfield, Middx.
1759 A. M. Cameron, 6 Cluny Avenue, Bearsden, near Glasgow.
1760 R. Harris, 35 Freemantle Road, Eastville, Bristol 5.
1761 G. R. Payne, 132 Broomfield Road, Chelmsford, Essex.
1762 D. H. Joyce, 85 Hanney Road, Steventon, Abingdon, Berks.
1763 J. R. D. Viney, The Old Farm House, Steventon, Abingdon, Berks.
1764 M. C. Spencer, 13a Steep Hill, Lincoln.
1765 R. Blain, 1 Millbank, Ness, Neston, Wirral, Cheshire.
1766 R. R. McLeod, Holly Cottage, Burney Road, Westhumble, Dorking, Surrey.
1767 J. L. Almond, Borrowby, Moorside Avenue, Ripon, Yorks.
1768 D. J. O. Taylerson, 9 Avenue Gardens, Teddington, Middx.
1769 A. J. Gainsborough, 46 Acacia Road, Hampton, Middx.
1770 C. Bone, 32 Lavender Grove, Mitcham, Surrey.
1771 H. P. Richardson, 51 De Lacy Street, Ashton, Preston.

* Denotes transfer to Corporate Grade.
† Denotes previously a member.

Forthcoming Events

Details for inclusion in this feature *must* reach the appropriate Regional Representatives *not later than the 18th of the month* preceding publication. T.R.s and club secretaries are reminded that the information submitted *must* include the date, time and venue of the meeting and, whenever possible, details of the lecture or other event being arranged. Regional Representatives are requested to set out copy in the style used below.

REGION 1

Blackpool (B. & F.A.R.S.).—Tuesdays, 7.30 p.m. Squires Gate Holiday Camp.
Bury (B.R.S.).—February 10 (" Construction Practice," G8VF), George Hotel, Kay Gardens.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m. Gladstone Mission Hall, Queens Drive, Stoneycroft.
Macclesfield.—January 27, February 10, 24, The Bruce Arms, Crompson Road.
Manchester (M. & D.R.S.).—February 2, 7.30 p.m., Brunswick Hotel, Piccadilly. (" Transformers," by R. Boardman).
Manchester (S.M.R.C.).—February 6 (" Transistor Audio Amplifiers," Lecture and Demonstration); February 13 (Hot Pot Supper), Ladybarn House, Mauldeth Road, Manchester, 20.
Preston (P.A.R.S.).—January 21, 7.30 p.m. (Annual General Meeting), Fruiterers' Club, High Street.
Wirral (W.A.R.S.).—January 16, February 6, 20, 7.45 p.m. No. 4 Hamilton Square, Birkenhead.

REGION 2

Bradford (B.A.R.S.).—January 27 (Display of Members' Equipment); February 10 (" Colour Television " by G. N. Patchett, Ph.D.); February 24 (" Transmitter Design and Construction," D. M. Pratt, G3KEP).

REGION 3

Birmingham (M.A.R.S.).—January 20, 7.30 p.m. (Lecture/Demonstration), Midland Institute, Paradise Street, Birmingham. **(Slade).**—January 16, February 6, 7.45 p.m., Church House, High Street, Erdington. **(South).**—January 30, 7.30 p.m., Stirchley Institute.
Coventry.—January 23, 7.30 p.m. (" Radio Theory " by J. L. Boyce), Vine Street School. **(C.A.R.S.).**—Mondays, 7.30 p.m., 9 Queens Road.
Stourbridge & District.—January 23, White Horse, Amblecote. February 3, Brotherhood Hall, Scotts Road.

REGION 4

Derby (D. & D.A.R.S.).—January 21 (" For the Beginner "); January 28 (Members' Exhibition Night); February 4 (Annual General Meeting), 7.30 p.m., Room 4, 119 Green Lane, Derby.
Derby (S.W.EXP.S.).—Sundays 10.30 a.m. January 15, 22, 29, February 5, 12, 7.30 p.m., Club Room, Nunsfield House, Boulton Street, Alvaston.

Leicester (L.R.S.).—January 19, 26, February 2, 9, 16, 7.30 p.m., Old Hall Farm, Braunstone Lane, Leicester.

Lincoln (L.S.W.C.).—January 21, February 4, 18, 7.30 p.m., Technical College, Cathedral Street.

REGION 6

Oxford (O. & D.A.R.S.).—February 11 ("Transistor Theory"); February 25 ("Transistor Applications"), 7.30 p.m., Cherwell Hotel, Water Eaton Road, Oxford.

REGION 7

London.—January 23, 6.30 p.m. Presidential Address by Dr. R. L. Smith-Rose, C.B.E., Institution of Electrical Engineers, London, S.W.1.

Acton, Brentford & Chiswick.—January 20, 7.30 p.m. (Annual General Meeting), A.E.U. Rooms, 68 High Road, Chiswick.

Barnet (B. & D.R.C.).—January 27, 7.30 p.m., Red Lion Hotel, High Barnet ("KW Electronics' products," R. G. Shears, G8KW).

Bexleyheath (N.K.R.S.).—January 22 ("Power Pack Design" by S. C. Hasted, G3BHF), Congregational Hall, Clock Tower, Bexleyheath.

Croydon (S.R.C.C.).—January 30, 7.30 p.m. (Annual Dinner), Greyhound Hotel, Croydon.

Ealing.—Sundays, 11 a.m., ABC Restaurant, Ealing Broadway, W.5.

East Molesey (T.V.A.R.T.S.).—February 4, Carnarvon Castle Hotel, Hampton Court.

Harlow & District.—Tuesdays, 7.30 p.m., rear of G3ERN (G. E. Read).

Holloway (G.R.S.).—Mondays and Wednesdays, (R.A.E. and Morse), Fridays (Morse and Club), 7 p.m., Montem School, Hornsey Road, N.7.

Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road, Ilford.

South Kensington (C.S.R.S.).—February 9, 6 p.m., Lecture Hall, Science Museum ("High Fidelity Techniques," Lecture and Demonstration).

Kingston.—Lecture alternate Thursdays, 8 p.m., Theory and Morse classes weekly. 5 Penrhyn Road, Kingston, Surrey.

Norwood & South London.—First Tuesday in month (R.A.E. and Morse classes); January 17 (Demonstration of T.A. Mobile Army Equipment), 7.30 p.m., Windermere House, Westow Street, Crystal Palace.

Romford (R.D.A.R.S.).—Tuesdays, 8.15 p.m., R.A.F.A. House, 18 Carlton Road, Romford.

Slough.—February 2, 7.45 p.m., Plough Hotel, Wexham Street, Wexham.

Welwyn Garden City.—February 12, 8 p.m. (Junk Sale). I.C.I. Recreation Club, Blackfan Road, Welwyn Garden City.

REGION 9

Bath.—January 19, February 16, 7.30 p.m., 12 James Street West, Bath.

Bristol.—January 16 ("Frequency Measurement," D. V. Newport); February 6 (Film Show, arranged by John Dear), 7.15 p.m., Carwardine's Restaurant, Baldwin Street.

Torquay.—February 14, 7.30 p.m., Y.M.C.A., Castle Road, Torquay.

Yeovil.—January 21, 28, February 4, 11, 7.30 p.m., British Legion, Grove House, Preston Road, Yeovil.

REGION 10

Port Talbot.—February 3, March 3, April 7, 7.30 p.m., Talbot Arms Hotel, Taibach, Port Talbot.

REGION 13

Edinburgh (L.R.S.).—January 22 (Film show—"Transistors" and "Mirror in the Sky"); February 5 ("Air Traffic Control"); February 19 ("More about S.s.b."), 7.30 p.m., 25 Charlotte Square, Edinburgh.

REGION 14

Falkirk.—February 13, 7.30 p.m., Temperanee Café.

DATES FOR YOUR DIARY

1959

January 23.—Presidential Address.
February 27.—London Lecture Meeting.
March 14.—Scottish V.H.F. Convention.
March 20.—London Lecture Meeting.
April 12.—Blackpool O.R.M.
April 26.—North Midlands Mobile Rally.
June 14.—Longleat Mobile Rally.
September 13.—Woburn Abbey Mobile Rally.

Slow Morse Practice Transmissions

G.M.T.	Call-sign	kc/s	Town
Sundays			
09.00	G3BHS	1810	Southampton
09.30	G3BKE	1900	Newcastle-on-Tyne
10.30	G3FFA	1935	Barnet
11.00	G3GZE	1840	Blackburn
11.00	G2FXA	1900	Stockton-on-Tees
11.30	G3JDO	1900	Hebburn-on-Tyne
12.00	G3LP	1850	Cheltenham
12.00	GI5UR	1860	Belfast
15.00	G3LEQ	1990	Tunbridge Wells
15.00	G3LGK	1850	Ilkeston, Derby
20.00	G3MRA	1810	Southampton
20.30	G3HTA	1850	Exeter
21.00	G2FIX	1812	near Salisbury
Mondays			
17.30	G3MXI	1875	West Hallam, Derbys.
18.00	G3GZE	1840	Blackburn
18.30	G3NC	1825	Swindon
19.00	G3KTP	1850	Heanor, Derby
19.00	G3LMT	1850	Exeter
20.00	G3MDH	1860	Southampton
20.30	G3AGN	1875	Felixstowe
20.30	G3LSF	1900	Southport
21.00	G3BHS	1810	Southampton
Tuesdays			
17.30	G2AAM	1875	Swanwick, Derbys.
18.00	G3GZE	1840	Blackburn
18.30	G2FXA	1900	Stockton-on-Tees
20.00	G3JLS	1810	Southampton
20.00	G2FCI	1850	Exeter
21.00	G3BHS	1810	Southampton
21.00	G3EFA	1855	Southport
21.15	G2CPL	1875	Felixstowe
21.45	G2UK	1875	Lowestoft
Wednesdays			
17.30	G3MXI	1981	West Hallam, Derbys.
18.00	G3GZE	1840	Blackburn
19.00†	G3MCJ, G3FLK, G2FCI, G3HTA	1845	Exeter
19.00	G3LZC	1830	Heanor, Derby
19.00	G8RQ	1850	Chesterfield
19.30	G3BIA	1900	Twickenham
Wednesdays			
20.00	G3IBI	1810	Southampton
21.00	G3BHS	1810	Southampton
22.00	G3JJC	1990	S.E. London
Thursdays			
17.30	G2AAM	1981	Swanwick, Derbys.
18.30	G3NC	1825	Swindon
19.00	G3LXL	1850	Nottingham
20.00	G3MCL	1810	Southampton
20.00†	G2ABR	1919	Hull, Yorks.
21.00	G3FCY, G3GWT, G3KTO		
20.30	G3GDZ	1910	Kingsbury, N.W.9
21.00	G3BHS	1810	Southampton
21.30	G3HMY	1850	Exeter
22.00	G3JIT	1990	S.E. London
Fridays			
18.30	G3DMN, G3FVP	1880	Ipswich
19.30	G3FUA	1850	Kilburn, Derby
19.30	G3MHR	1850	Swanwick, Derbys.
20.00	*G3IXN, G3KSF	1810	Southampton
20.30	G3ICX	1915	Sutton Coldfield
20.30	G3KGU	1915	Theydon Bois, Essex
21.00	G3BHS	1810	Southampton
21.30	G3MGS	1970	Chislehurst
21.30†	G3KLZ, G3KSS	1900	Bradford
22.00	G3KYU	1859	Bournemouth
Saturdays			
09.00	G3BHS	1810	Southampton
13.00	G2FXA	1900	Stockton-on-Tees
14.30	G3BIA	1900	Twickenham
20.00	G3MCL	1810	Southampton

† *Alternately.*
* *Slow Morse QSO.*

Conversion Articles

THE Editor will be pleased to consider articles on the conversion for amateur use of the ex-Army receivers types R.107 and R.208 and the No. 36 Sender.

Congratulations

CONGRATULATIONS are extended to Mr. C. Harold Chorley, G5YH, of Chiswick, London, W.4, who was appointed a Commander of the Most Honorable Order of the Bath in the New Year Honours List. Mr. Chorley is a Parliamentary Counsel to the Treasury.

Silent Keys

JIM BROWN (W6AY)

From Leslie Hill (ex-G5WI), now in California, comes news of the untimely death of Jim Brown (W6AY). Before Leslie left England he had had 865 scheduled contacts with W6AY. Jim was well known to many old timers in the U.K. who will mourn his passing. He is survived by his wife and two sons to whom sympathies are extended.

E. J. BUICK (G2SR)

With deep regret we report the death, suddenly on December 1, 1958, of Mr. E. J. Buick (G2SR) at the age of 66 years. " Digger " as he was familiarly known among the local group was a colourful personality and his voice will be much missed on the air. For him, Amateur Radio was an all-important part of life and he was active right up to the time of his death, following a collapse at work. Mr. Buick was a member of the Society from 1939 to 1951 serving as T.R. for Slough for a period.

Sympathies are extended to Mrs. Buick who heard of her husband's death whilst herself in hospital.—F. J. T. T.

A. J. CRYER (G2BXL)

We record with deep regret the passing of Albert Cryer (G2BXL) of Fleetwood, Lancs., on November 25, 1958.

Although he had not transmitted for some years, due to illness, Mr. Cryer remained a keen listener until the last. His passing will be mourned by those who have missed his cheery voice on daily 3·5 and 7 Mc/s nets.

An A.A. licence holder pre-war he took up the hobby with great enthusiasm when fully licensed and was a very efficient operator on the bug key. Always willing to help the beginner, Amateur Radio has lost a valuable asset.—G4HH.

JACK HANSON (G6YU)

Amateur Radio is the poorer by the death on November 13, 1958, of Mr. Jack Hanson (G6YU) of Coventry. Mr. Hanson received his licence in the old 440m days, since when he remained continuously active, except for the war years, on various bands including 2m. Sympathies are extended to his family.—J.R.T.

WILFRED STEELE (G3GWJ)

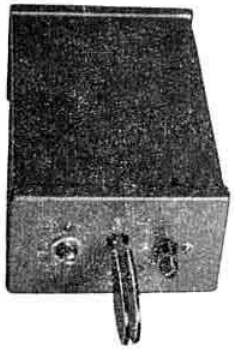
It is our sad duty to record the death, at the age of 52 years, of Wilfred Steele, (G3GWJ) of Eastwood, Notts., on Sunday, December 7, 1958. Wilf, who operated mainly on Top Band, 7 and 21 Mc/s had a wide circle of friends who will greatly miss his friendly voice on the air. Since the tragic death of his wife two years ago, Mr. Steele had been in and out of hospital several times.

G3FGY, G3KTP and G3LGK were present at the interment to which floral tributes were sent by local members. Heartfelt sympathies are extended to Mr. Steele's sister Doris and family.

—E. E. W.

J. WEST (B.R.S. 13897)

We record with sorrow the passing of Mr. J. West (B.R.S. 13897) of Redmile, Nottingham. Mr. West joined the Society in 1946 since when he had been an ardent short wave listener. Sympathies are extended to his widow and other relatives.



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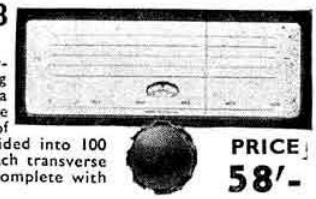

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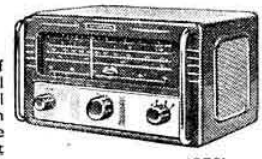

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$\frac{7}{8}$" „	7/3 „
$1\frac{1}{16}$" „	8/– „
$1\frac{1}{8}$" „ Int. Octal.	8/9 „
$1\frac{1}{4}$" „	10/– „
$1\frac{3}{8}$" „	11/3 „
$1\frac{1}{2}$" „ B9G	12/6 „
$2\frac{3}{32}$" „ Meter	18/– „

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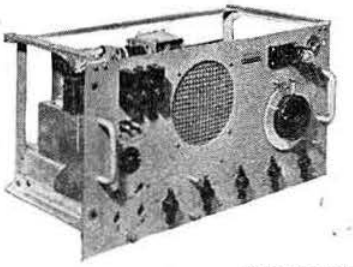

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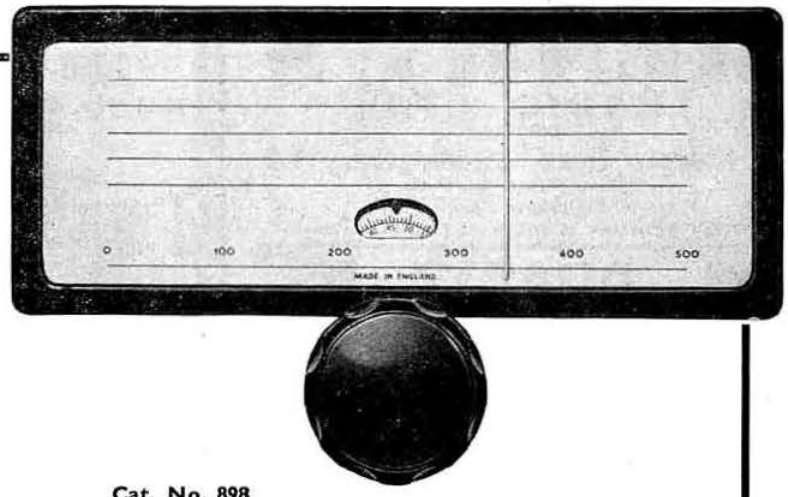

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3Q5GT	9/6	6BX6	8/-	6R7G	10/-	10P13	17/6	28D7	7/-	AP4	7/6	EB41	8/6	EF89	10/-	KT33C	10/-	PM12M	6/6		10/6	X76M	14/-
3S4	7/6	6C4	7/-	6SA7GT	8/6	11E3	15/-	30	7/6	ATP4	5/-	EB91	6/6	EF91	7/6	KT44	15/-	PY80	8/-	UAF42	10/6	XD (1·5)	6/6
3V4	9/-	6C5	6/6	6SC7	10/6	12A6	6/6	30C1	9/-	AZ31	10/-	EBC33	7/6	EF92	5/6	KT63	7/-	PY81	9/-	UB41	12/7	XFG1	18/-
4D1	7/6	6C6	6/6	6SG7GT	8/-	12AH7	8/-	30F5	8/-	BL63	7/6	EBC41	10/-	EK32	8/6	KTW61	8/-	PY82	9/-	UBC41	10/-	XFY12	6/6
5R4GY	17/6	6C8	12/6	6SH7	8/-	12AH8	10/6	30FL1	10/-	CK506	6/6	EBF80	10/-	EL32	5/6	KTW62	8/-	PY83	9/6	UBF80	9/6	XH (1·5)	6/6
5U4G	8/6	6C9	12/6	6SJ7	8/-	12AT6	10/6	30L1	9/-	CK523	6/6	EBF89	9/6	EL34	17/6	KTW63	8/-	QP21	7/-	UBF89	10/6	XSG (1·5)	
5V4G	11/6	6C10	12/6	6SK7GT	8/-	12AT7	8/-	30P12	12/6	CV63	10/6	EC52	5/6	EL41	11/-	KTZ41	8/-	QP22	15/-	UCC85	10/6		15/6
5X4G	12/6	6CH6	12/6	6SL7GT	8/-	12AU7	7/6	30PL1	12/6	CV85	12/6	EC54	6/-	EL42	11/6	KTZ63	10/6	QS95/10	10/6	UCH42	11/-	Y63	7/6
5Y3G	8/-	6D6	6/6	6SN7GT	7/6	12AX7	10/-	31	7/6	CV271	10/6	EC70	12/6	EL81	15/-	L63	6/-	QS150/15		UCH81	11/6	Z63	10/6
5Y3GT	8/6	6K5	12/6	6SQ7GT	9/-	12BA6	9/-	33A/158M		CV428	30/-	ECC31	15/-	EL84	10/6	LN152	14/-		10/6	UCL82	15/6	Z66	20/-
5Y4	12/6	6F6G	7/-	6S87	8/-	12BE6	10/-		30/-	D1	3/-	ECC32	10/6	EL91	5/-	LZ319	9/-	QV04/7	15/-	UF41	9/-	Z77	7/6
5Z3	12/6	6F6GTM	8/-	6U4GT	12/6	12C8	15/-	35/51	12/6	D42	10/6	ECC33	8/6	EL95	10/6	MH4	7/-	R2	10/-	UF80	10/6	Z719	8/-
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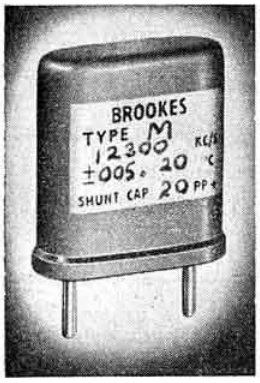

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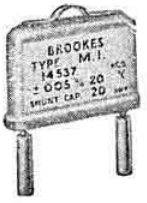

● *Illustrated above is a Type M Crystal Unit from a range covering 8-20 Mc/s and on the right is a Type M1 Crystal Unit from a range covering 8-20 Mc/s.*

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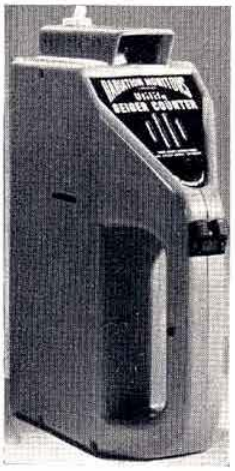

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