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Current Comment

Shows Large and Small

THE Society's participation at the Earl's Court National Radio Exhibition is a mechanism for showing something of ourselves to the outside world. The R.S.G.B. Stand is Amateur Radio's shop window.

By contrast the November exhibition at "The Royal" is the occasion on which the movement entertains itself, so to speak. While a fair proportion of visitors are ordinary members of the public who come through curiosity, the great majority are dyed-in-the-wool radio amateurs who have two objectives in mind: first, to bring themselves up to date on current technique, and secondly to make the most of a very special social occasion, when like meets like as at no other time. Useful though the Earl's Court Show is, it fulfills neither of these purposes in quite the same way that the November exhibition does.

There have been various proposals from time to time that the Amateur Radio Exhibition should be larger and more ambitious. To counter them comes the viewpoint that much of the intimacy and "ham spirit" which inspire the shows at "The Royal" would be lost were the affair made bigger.

After nine years the exhibitions have acquired an "atmosphere" of their own, and any tinkering with them could easily dispel it. But if there is room for improvement or expansion then members should be giving the matter some thought. The correspondence columns are open to all who have constructive ideas to express.

Delayed Action

"HOW is the state of the membership?" The question, while not couched in precisely this form, is one of the first to be considered at every monthly meeting of the Council.

First of all the number of new members joining the Society is reported to the Council Members by the Secretary. Then comes a report upon the state of renewals: how many members have renewed subscriptions, how many have dropped out for one reason or another and how many have *not* dropped out but simply failed to renew their subscriptions within a reasonable time. On this last count it is frequently the case that a hundred or more may still be overdue three months or more after they should have paid up.

This can easily happen as the result of the normal preoccupations of everyday life, or from sheer forgetfulness, as was demonstrated in the case of many of the Bankers' Order "lapsers." And as long as the BULLETIN continues to come through the front door letter-box—as it does for a few issues after expiry—a man may be excused for thinking he is still up to date on his subscription.

Those who do not renew promptly are the cause of much needless expenditure of time and effort, and expenditure on paper and postage on the part of Headquarters' clerical staff. This money comes out of income. Really, it need not be spent. Prompt renewal of subscription will help ensure that it is not.

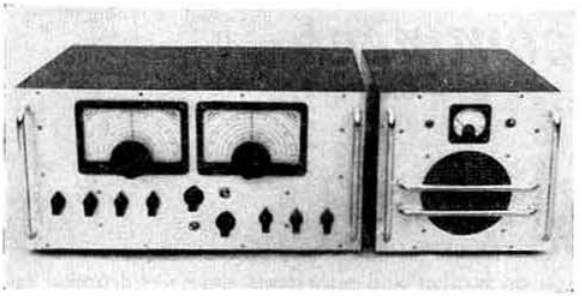
Prestige Station

THE Science Museum in London has always given a good showing to the development of radio, and it has done so in a dynamic manner. Never content with simply displaying static exhibits—essential though these are—it has strongly featured exhibits such as that memorable high quality reproducer of a quarter of a century ago, and other practical demonstrations of the art.

Now it is to establish an Amateur Radio station. Officials of the Museum and Representatives of the R.S.G.B. in close accord have been working together with the object of making the station a model of its kind, radiating signals of world-wide range—and radiating something besides—namely prestige for the name of British Amateur Radio.

World-wide communication will not be its sole purpose; regular marker signals in the metre-wave allocations will be of immense value to workers in the u.h.f./v.h.f. spectrum, and it is hoped to initiate such a service shortly after the main station is in commission.—J. H.

The Britannia



The Society's Technical Committee has long been aware of the lack of authoritative contemporary information on the design and construction of receivers for amateur use. The writer was therefore asked to undertake the development of an amateur communications receiver to specifications laid down by the Committee. Ease of construction and the facilities of the average amateur workshop were kept constantly in mind. The result is a receiver worthy of a place in every amateur station. In its basic form it represents what is believed to be the minimum requirements of an acceptable receiver for the high frequency amateur bands, but refinements and additional facilities are provided for and may be incorporated later without having to rebuild earlier work.

This month the writer discusses the problems of design. Construction of the basic receiver will be described in the November issue and the refinements and additional facilities in December.

Part I—The Design of a Communications Receiver for the Amateur

By A. D. ODELL (B.R.S.20655)*

JUDGING by the small proportion of articles on receivers published in radio journals it would appear that as far as the h.f. bands are concerned the majority of amateurs confine their constructional activities to the transmitting side of the art and leave the receiver to the professionals. Since it is proposed to discuss here some aspects of receiver design and construction it would seem appropriate first to consider some of the suggestions which have been advanced as responsible for this general lack of interest.

It has been argued that in this field the average amateur is at a distinct disadvantage in three respects; depth of pocket, workshop facilities and technical ability, but each of these arguments would seem to apply equally to the transmitter. Amateur equipment is rarely constructed entirely from new components and the surplus market offers much more material for the receiver. It is also relevant to consider the workshop facilities and technical ability necessary for the construction of a 150 watt, v.f.o. controlled, band-switched, 'phone transmitter. A fourth objection, lack of test gear, can be overcome with a little ingenuity. Apart from a simple voltmeter, the only requirement is a source of r.f. for alignment purposes and this could be obtained, for example, from a grid dip oscillator.

In short, the validity of the objections quoted above would appear to be open to debate. Perhaps the real reason is simply that most amateurs prefer to build transmitters, but it should not be forgotten that modern communication receivers owe their origin to equipment designed by amateurs in days when this was the only means of achieving the required performance; the fact that this situation no longer exists is itself a tribute to the soundness of those early designs. Certainly the basic requirements have not changed, only the emphasis, and it is hoped that the ideas and discussions which follow will be of general interest.

Basic Requirements

It is tempting to think of a home-built receiver in terms of highly efficient circuits yielding first-class results from a relatively few valves, but it must be remembered that efficiency is equally sought after in professional designs. There would not appear to be much justification for adding a b.f.o. and two extra wavebands to the conventional broadcast receiver since equipment which just satisfies normal requirements for broadcast reception is unlikely to be adequate for communication purposes. Performance can certainly be improved by tricks such as reflexing and regeneration, but such circuits frequently have hidden snags. If commercial designers find it necessary to employ ten or more valves to obtain the required performance there must be good reasons. There are three basic requirements for any receiver which pretends to satisfy the exacting demands of amateur work and meeting them involves a certain minimum of complication.

(1) The receiver must amplify any signal which it is desired to copy to the level at which the information can be most easily extracted.

(2) It must reject to the greatest possible extent any unwanted interference while at the same time avoiding loss of information from the wanted signal.

(3) Any adjustments which are necessary for the selection of signals and the rejection of interference must be smooth, positive and stable.

These three requirements may be summarised as (1) sensitivity, (2) selectivity, and (3) control, and they are inter-related to an extent which obscures their relative importance; however, sensitivity is a convenient starting point.

Sensitivity

It is well known that a practical limit to the amplification which a receiver can usefully employ is set by noise. For present purposes this noise can be roughly divided into two classes—that generated in the receiver (and which the designer can do something about) and that picked up by the aerial (over which he has little or no control). In the first case valve noise is the predominant factor and for a receiver having a mixer as the first stage and a 5 kc/s bandwidth the equivalent noise at the first control grid will be of the order of

*31 Edison Road, Welling, Kent.

5μV. In a receiver incorporating an efficient pentode r.f. amplifier the equivalent noise at the first grid will be of the order of 1μV for the same bandwidth. The second class of noise is more difficult to assess accurately, but at frequencies below about 15 Mc/s it may be taken as being equivalent to a microvolt or more at the first grid for the same passband. From this it can be seen that an efficient r.f. stage is necessary if signals below 10μV are to be copied, and that a single pentode amplifier is just about sufficient to resolve the weakest detectable signals at frequencies of 15 Mc/s and below. It should be added that even at the 10μV level an r.f. stage gives a considerable improvement in intelligibility, and it is not until the signal-to-noise ratio exceeds 20 or 30 db that noise can be ignored. These are admittedly generalisations but they are accurate enough for our purposes, and since the amateur is frequently interested in extremely weak signals an r.f. stage should therefore be considered highly desirable from this standpoint.

It will have been noted that in the above discussion the receiver bandwidth was specified. This is because the noise, by its nature, is evenly distributed over a wide range of frequencies, and by restricting the bandwidth, only those frequencies falling within the passband are allowed to contribute to the receiver output. Since the individual noise components add together on an r.m.s. basis the actual sound in the speaker will be proportional to the square root of the bandwidth, i.e., by reducing the passband by a factor of four the effective noise output of the receiver can be halved, and this applies to both classes of noise previously discussed. Bandwidth therefore is an important factor in determining the useful sensitivity and thus the maximum amplification required.

Selectivity

The previously stated requirement of selectivity implies that the receiver should just accept all the sidebands of the desired signal and no more. Since the amateur is primarily interested in two types of signal —speech and c.w.—and since these two types involve widely differing sideband components it follows that two appropriately chosen degrees of selectivity are desirable. A bandwidth of 6-7 kc/s is adequate for speech, and 100 c/s or so will suffice for c.w., but other considerations may affect the choice. A condition frequently arises in speech reception, for example, when the amount of intelligence contributed by the higher order sidebands is less than the amount of intelligence lost due to interference occurring at these particular sideband frequencies. In such circumstances an increase in intelligiblity can often be realised by a reduction in bandwidth, accompanied perhaps by slight detuning. In the limit the passband can be so reduced and the receiver so detuned that only one set of sidebands is received, the resultant distortion being reduced by supplying a heavy local carrier from the b.f.o. This is effective in cases of severe adjacent channel interference occurring on one side of the wanted signal, but makes extreme demands in the way of stability from both receiver and transmitter. On the other hand there are occasions when a c.w. signal cannot be contained within a passband of 100 c/s due, perhaps, to transmitter drift or chirp. This is particularly likely at the higher frequencies and in such cases a wider bandwidth would be desirable.

It must be emphasised that whereas bandwidth is normally specified as the frequency difference between points at which the response is 6db down, an equally important consideration is the frequency difference between points at which the response is, say, 50db down. It is the latter which determines the extent to which strong adjacent signals will be rejected, and good performance in this direction is generally much more difficult to obtain. There remains, finally, the question of the position in the receiver at which the selectivity is introduced. Selectivity before the detector prevents signals outside the passband from beating together and producing a signal inside the passband and is therefore preferable. Selectivity at audio frequencies is cheap and is satisfactory for c.w. reception, particularly if the pre-detector bandwidth is narrow enough to permit single-signal reception.

So far only adjacent channel selectivity has been discussed; there are, however, three other ways in which interference can occur. The first, peculiar to superhets, is the well-known image occurring at the wanted frequency either plus *or* minus twice the i.f., depending on which side of the wanted frequency the local oscillator is arranged to operate. For a receiver covering up to 30 Mc/s a satisfactory compromise between image and adjacent channel selectivity is difficult to achieve without resorting to the double-superheterodyne arrangement with a high first i.f., or to the use of a large number of signal-frequency tuned circuits. Practically all commercially produced r.f. and i.f. components are based on the standard figure of 465 kc/s, and for this value the conventional arrangement of two signal frequency circuits separated by an amplifier valve will provide adequate discrimination at the lower frequencies. At 30 Mc/s the protection will fall to something like 20 db which is admittedly insufficient, but the expense and complication of the two alternatives previously mentioned would seem difficult to justify on these grounds alone. In practice the situation is improved somewhat by the lower population density at the highest frequencies.

The second type of interference is cross-modulation arising from curvature of valve characteristics. If two signals are applied to the grid of a valve, and if one of these signals is of sufficient amplitude to vary the mutual conductance of the valve between positive and negative swings, then a fraction of any modulation on the strong signal will be transferred to the other. This state of affairs can arise when the difference in carrier frequency between the two is small enough for their amplitudes to be unaffected by the selectivity of the early tuned circuits; once cross-modulation has occurred no amount of subsequent selectivity can remove the unwanted modulation. Variable-μ valves are bad offenders, since they are deliberately designed with curved characteristics; the frequency-changer is also most likely to give trouble due to its position in the circuit. Fortunately, some of the most recent valves are relatively free from this effect. Cross-modulation can also occur in early i.f. stages if the bandwidth is reduced late in the i.f. chain, due, for example, to double conversion or to the inclusion of a crystal filter. A general remedy is to adjust the gain distribution in the receiver so that the signal levels at the offending stage are insufficient to cause trouble. Unfortunately this may necessitate reducing the gain of the r.f. stage to the point where the signal-to-noise ratio is adversely affected and it must ultimately be left to the operator to select the best compromise.

The third type of interference is the generation of spurious signals in the receiver itself due to harmonics of the r.f. and i.f. oscillators. Operation of both oscillators at the lowest level consistent with good efficiency is a help. In the case of the b.f.o. this may be facilitated by injection at the grid of the last i.f. stage rather than the anode.

Control

A communications receiver is in many respects a piece of scientific equipment, and one of the hallmarks of a good scientific instrument is precision. The need for precision is most apparent in tuning, and in this respect the requirements for an amateur receiver are particularly stringent. The first requirement is for a direct indication of the selected frequency, preferably to an accuracy of plus or minus 5 kc/s. Specification of the tuning arrangements must also be related to the selectivity, since it would be pointless to restrict the bandwidth to a few hundred cycles if the tuning could not be adjusted with a certainty better than, say, 1 kc/s. In addition, the needs of operators will vary; some may be concerned primarily with the c.w. portions of the high frequency amateur bands, others with a more general broadcast coverage. The situation is further complicated by the fact that with conventional tuning arrangements the change in tuning capacity necessary to produce a given change in frequency at 1.5 Mc/s is about two hundred times the amount necessary to produce the same change at 30 Mc/s. (This is discussed in more detail in Appendix 1.) The most satisfactory answer would appear to be a system of electrical bandspread in which the effective capacity of the bandspread condenser is variable over a wide range, the calibrations being cross-checked against harmonics from an accurate crystal oscillator.

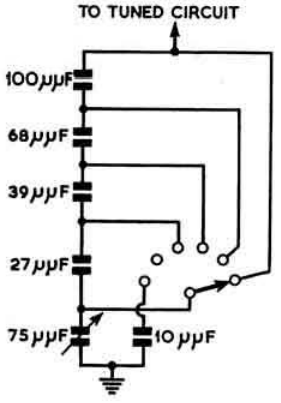


Fig. 1. Circuit for providing variable bandspread. The effective capacity change of the bandspread condenser is varied in steps of two to one by the six position switch.

Fig. 1 shows a circuit designed to operate in conjunction with a particular coil unit and in which the capacity change of the bandspread condenser can be adjusted in steps of 2:1 over the range 2μμF to 70μμF. Although less than the calculated requirement it represents a reasonable compromise and will provide roughly 500 kc/s bandspread over the majority of the tuning range. With a 12:1 slow motion dial graduated 0-100 this gives a tuning rate of some 200 c/s per degree rotation of the tuning knob and 5 kc/s per division of the scale. These figures conform to generally accepted criteria for operating convenience, but different degrees of bandspread may be obtained by selection of the appropriate switch setting.

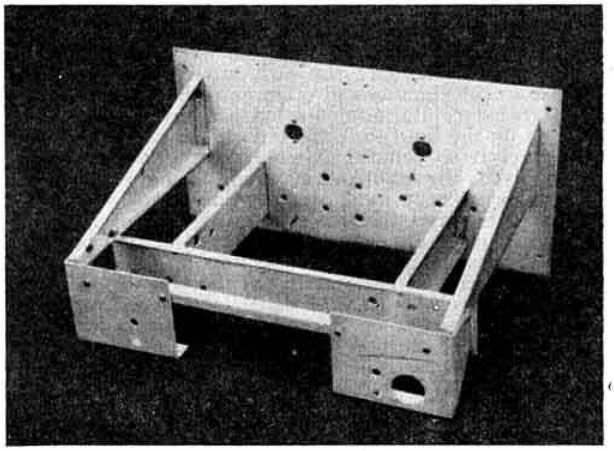
The problems of electrical and mechanical stability associated with extreme selectivity are severe at all frequencies and become particularly so at 30 Mc/s where a short-term stability approaching one part in a million would be desirable in the r.f. oscillator. In the writer's opinion the variety of components and wide tuning range practically excludes temperature compensation in a home-constructed receiver, but thermal effects should be minimised by careful location of the most sensitive circuits, i.e., the r.f. and i.f. oscillators. From the electrical standpoint it is advantageous to supply these stages from a stabilized h.t. line, while operation of the mixer with fixed bias and a stabilized screen potential reduces the effect of a.v.c. on the r.f. oscillator.

Construction

Nothing has been said so far about the practical problems of receiver construction. These boil down in the long run to devising an arrangement which satisfies the technical requirements and yet does not make excessive demands from the constructor in the way of mental and physical effort or expense. The layout should cater for a considerable amount of modification and addition since this facility constitutes one of the major arguments in favour of home construction. The most satisfactory scheme would appear to be one in which the complete receiver is built up from a number of individually wired sub-units. On this basis the constructor could tailor-make a receiver to his own specification merely by inclusion of the appropriate units. In the first instance, for example, a relatively simple combination could be built and refinements added subsequently, while improved components and circuit techniques could be incorporated as they became available, thus keeping the receiver up-to-date. Such an arrangement might be slightly more expensive initially by virtue of the more complicated metalwork, but should be cheaper in the long run.

A suitable framework for supporting a number of sub-units designed on the above lines is shown in one of the photographs. The construction combines adequate shielding with good accessibility and leaves the central space free for mounting the r.f. circuits. It is considered that a prohibitive amount of work is involved in the design and construction of the tuning coils and associated switching and in view of this the r.f. unit should preferably incorporate a commercial coil pack.

No provision has been made in the layout for accommodating the power supply as there are a number of advantages to be gained by excluding the power supply and possibly the audio output stage from the receiver cabinet. In the first place these components may well be responsible for a large fraction of the total heat dissipation and must therefore have an appreciable effect on thermal drift. Secondly, they are not normally required for portable work and it is convenient to be able to separate them easily. Thirdly, a speaker cabinet is



Individual stages can be pre-wired and then mounted on a suitable chassis framework such as that shown above.

required in any case, and it is reasonable to make use of some of the space by including these two items in it, particularly since they form in combination a convenient unit for use with other equipment.

Specification

From the considerations dealt with so far it is possible to formulate more clearly the shape of a receiver likely to meet the various requirements of short wave listeners and amateur operators. Taking first the minimum requirements these are to some extent a matter of opinion but a sensitivity of 10μV and a single bandwidth of 5 kc/s can perhaps be considered as representing a satisfactory performance for general purposes. To achieve it there does not appear to be any practical alternative to the superheterodyne in which case the bandwidth requirement can be adequately met by good quality 465 kc/s i.f. transformers. For a one volt signal at the grid of the output valve an overall gain of some 100db will be needed and this can be provided in a number of ways, some of which are shown in Table 1 with a comparative evaluation of four aspects of the overall performance. The following gains have been assumed for a single stage: r.f. 20db; mixer 20db; i.f. 30db.; a.f. 25db. The selectivity figures are a measure of the amount of detuning necessary for an attenuation of 50db, i.e., to reduce an S9 signal to S1, assuming typical i.f. transformers. The a.v.c. comparison assumes no control on the mixer and a delay appropriate to the particular combination. The other comparisons are arbitrarily based on conclusions reached earlier.

The last alternative shown in Table 1 is obviously preferable despite the fact that it is somewhat more expensive than the others; the basic circuit will therefore take this form and is shown in more detail in Fig. 2. B.f.o. injection is made at the grid of the last i.f. stage and to maintain a constant level of oscillation at the detector the manual i.f. gain control operates on the first stage only whereas a.v.c. is applied to both stages. This circuit arrangement would form a suitable basis for the subsequent addition of the following refinements: (1) additional audio stage; (2) audio filter for c.w.; (3) noise limiter; (4) variable bandspread; (5) crystal calibrator; (6) variable bandwidth crystal filter; (7) signal strength meter.

TABLE 1

Three possible circuit arrangements giving a sensitivity of about 10 microvolts. The selectivity figures represent the de-tuning necessary for an attenuation of 50 db assuming an intermediate frequency of 465 kc/s.

Circuit Arrangement	Performance			
	A.V.C.	Selectivity	Image	Noise
R.F.–Mixer–I.F.–A.F.	Fair	15 kc/s	Fair	Good
Mixer–I.F.–I.F.–A.F.	Fair	8 kc/s	Poor	Poor
R.F.–Mixer–I.F.–I.F.	Good	8 kc/s	Fair	Good

Additional audio amplification is an inexpensive way of increasing the sensitivity, and this could conveniently be combined with the audio filter and noise limiter. While it is difficult to design a really effective noise limiter to follow a selective i.f. amplifier such devices can be of considerable value in noisy locations and are relatively cheap. Variable bandspread offers a great improvement in operating convenience but if the bandspread dial is to be calibrated the main tuning control must be accurately set for these calibrations to have any true value. The crystal calibrator provides a convenient way of achieving this. The advantage of a variable bandwidth has already been discussed, and modern crystal filters are capable of satisfying most requirements. The real value of a signal-strength meter is open to question in these days when "all signals are S9 but some are more S9 than others." Most communication receivers include one, however, and again the cost is small.

The front view of a receiver constructed on the above lines is shown in the photograph at the beginning of this article together with a separate speaker and power supply; it is proposed to describe this particular equipment in more detail next month.

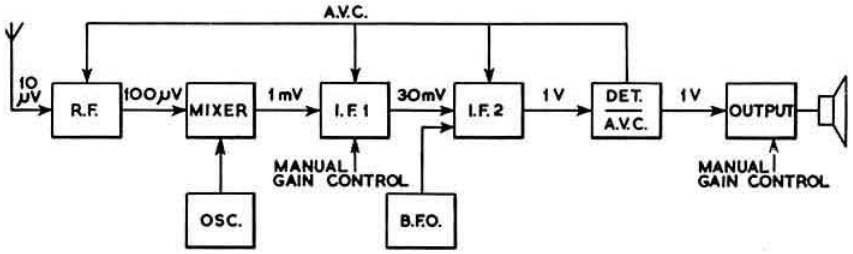


Fig. 2. Block diagram of the basic receiver suitable for general purpose short wave reception.

APPENDIX 1

Calculation of Bandspread Capacity

The resonant frequency of a tuned circuit is given by the well-known formula

$$f = \frac{1}{2\pi\sqrt{LC}}$$

The question we wish to answer is "In what way does the frequency vary with change in capacity over the desired tuning range?" Providing the changes are small the answer is given by differentiating the above expression with respect to C.

$$\frac{df}{dC} = -\frac{1}{2C\,(2\pi\sqrt{LC})}$$

$$= -\frac{f}{2C}$$

i.e.,

$$dC = -\frac{2C\,(df)}{f}$$

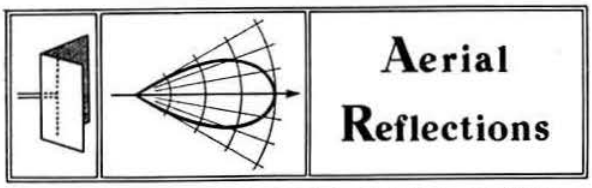
The negative sign indicates that an increase in frequency requires a decrease in capacity.

Taking typical values for (df) = 500 kc/s, C = 40$\mu\mu$F, f = 30 Mc/s, then dC = 1.3$\mu\mu$F;

for df = 500 kc/s, C = 360$\mu\mu$F, f = 1.5 Mc/s, then dC = 240$\mu\mu$F.

In the last case df is no longer small compared with f and so the answer will be inaccurate.

(To be continued next month)



Aerial Reflections

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

THIS is the first of a series of short discussions on aerials and allied subjects, which it is hoped to make into a regular feature. The aim will be to simplify the mysteries of aerial design and operation, to try to give a broader understanding of "how they work" and how to use them. The subjects will be chosen with respect to problems which commonly beset the amateur, and will be dealt with as far as possible in practical language (with occasional adventures in mathematical physics).

The Corner Reflector

It seems appropriate to start with the Corner Reflector, an aerial which deserves greater popularity, for it can justly be claimed that in terms of gain for its size, simplicity of erection and adjustment, it is superior to any other type. It is ideally suited to 420 Mc/s operation, but a little bulky for 144 Mc/s, and would not be considered for lower frequencies.

The reason for its superiority is that it can have the gain of a multi-element array, yet there is only one aerial element to adjust, so there is very little to do but to build it and discover that it works!

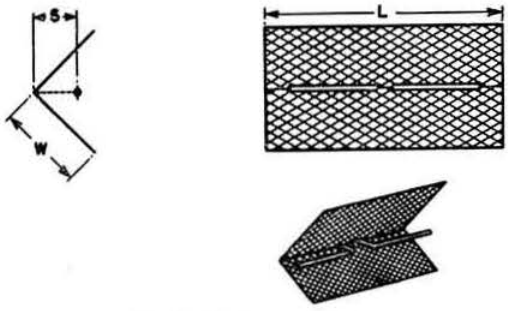


Fig. 1. The Corner Reflector.

Modus Operandi

Fig. 1 shows its basic form, a simple radiator set in the bisecting plane of two metal sheets. For convenience, and to avoid confusion when discussing polar diagrams, the bisector plane of the V (containing the dipole) is called the "E-plane," whilst the plane which bisects the dipole (and on which the metal cuts a V) is called the "H-plane"—referring to the electric and magnetic fields respectively. Radiation patterns (polar diagrams) in these two planes will give a fair indication of the performance of the aerial.

The angle between the sheets is not critical in any way, but does determine the form of the polar diagram, the beam becoming sharper as the angle is reduced. When this angle is a simple fraction of 180°, like 90°, 60° or 45°, the calculation of the properties of the aerial is easy.

To find out what happens, take two mirrors and set them up to make a 90° corner. Hold a pencil up to represent the aerial. If you look a little sideways you will see two images, one to each side, and a third behind the apex, spaced out at the corners of a square. If the mirrors are set at 60° there will be two images at each side and one behind—six aerials in place of one.

The currents induced by the aerial in the sheets produce exactly the same effect as if other radiators are placed in these image positions and thus with a 90° V reflector one has the polar diagram and gain of a four-element array: for 60° that of a six-element array. Since the currents cannot penetrate the sheets, the polar diagram must be entirely enclosed inside the angle of the V. Thus on account of the H-plane alone, a 90° reflector gives a power gain of 4, and 60° a gain of 6. But the beam also sharpens in the E-plane, making the total gains up to 10 (10 dB) for 90° or 16 (12 dB) for 60°. The field strengths at a distant point are increased 3 and 4 times respectively when the reflector is added to the dipole.

The author of these informative articles, specially written for the BULLETIN, is an acknowledged authority on aerial systems and his "aerial circus" has long been famous. "Dud," as he is familiarly known in Amateur Radio circles, will give readers the kind of practical advice that has made his lectures so popular.

Practical Details

The practical question likely to be asked is "how big and how good must the reflector sheets be?" Opinions vary but calculations indicate that since there is very little current at the ends, the length L need be very little more than half wave, say, about 20 per cent longer than the aerial. The width W must, however, be adequate, and must increase rapidly as the angle is reduced, otherwise current will "spill over" the front and spoil the gain and front/back ratio. For a 90° angle, a width of one wavelength is sufficient, but for 60° it must be two wavelengths, or the aerial may behave more like a 90° V. The 90° design is, therefore, the practical one: the extra 2 db gain of the 60° type is costly.

The reflectors can be made of quite light material such as chicken-wire: the current spreads well and, therefore, low resistance material is not necessary. Also quite open mesh makes a perfectly good reflector: 1 in. mesh will still give a 20 db back to front ratio at 400 Mc/s. Rods or thick wires may be used if they lie parallel to the aerial. Finally, because there is no current at the apex, it need not be joined. A most obliging aerial!

Impedance Matching

The Corner Reflector once again is very helpful in the matter of feed impedance. Moving the aerial outwards from the apex of the reflector varies the resistance over a wide range, but has only a minor effect on the polar diagram and gain. Hence all one has to do is to adjust the position of the aerial until it matches into the feeder. For a 90° corner reflector, R = 60 ohms when the distance S from the apex is one-third wavelength. At one-half wavelength it has risen to 120 ohms. For 60° angle the change is more rapid, from 20 ohms to 150 ohms between 0.45 and 0.65 wavelength.

Stacking

It is to be expected that gain and directivity can be improved by building up on the simple reflector system,

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and this is practicable at least on 435 Mc/s. The following results, which are theoretical, indicate what to expect if the dipole is developed into a line array, or a stack of two units. But first of all, let it be understood that there is no promise from replacing the dipole by a two- or three-element unit shining into the V: the two principles are utterly different and won't mix.

Fig. 2 and Table I give some examples. The position $S=\lambda/3$ is better than $S=\lambda/2$ in all cases, but note that in case 2, with two dipoles end-to-end, there is very little profit. This is because the mutual impedance between the aerials raises the resistance more rapidly than the forward signal improves. Case 2a, where the dipoles are spaced, gives quite a sharp beam and the expected extra 3 dB, whilst the minor lobes are quite small. This aerial could be fed from a 70 ohm line through two 100 ohm branch lines each $1\frac{1}{4}$ wavelengths long. Alternatively, the dipoles could be folded and fed from a 150 ohm line through two equal 300 ohm branches of any length.

It doesn't help to introduce a third dipole into the gap of 2a: the minor lobes vanish, but the aerial resistances become very high and unequal, making feeding very difficult, and the gain lower!

Further horizontal extension may make the beam too sharp for general searching, but vertical stacking can give another 3 dB gain and help to reduce aircraft flutter.

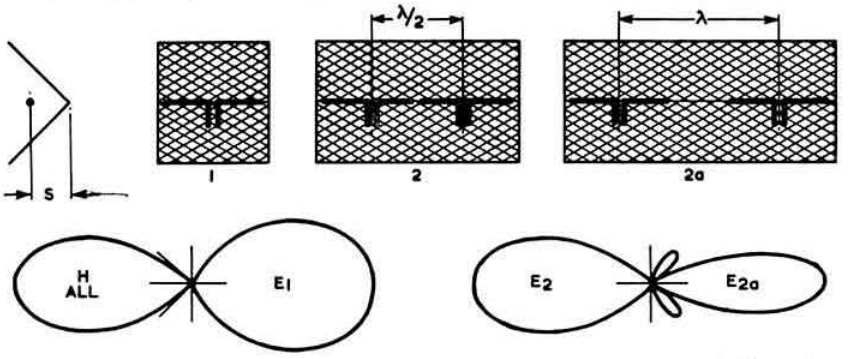


Fig. 2. Corner Reflector Patterns. The H diagram is the vertical pattern for all aerials shown. The E diagrams are the horizontal patterns.

TABLE I

Properties of 90° Corner Reflectors

Upper values $S = \lambda/3$ Lower values $S = \lambda/2$

	H	E_1	E_2	E_{2a}
Total (3 dB) Beamwidth	44 40	60 76	44 50	26 28
Gain over Dipole (dB)	—	10.3 9.7	11.4 11.0	13.2 13.0
Dipole Resistance (ohms)	—	61 125	100 190	62 120
Minor Lobes	—	—	—	−12dB −10dB

The vertical spacing should be as great as possible to prevent interaction; at one wavelength between dipoles the vertical diagram is 22° wide and the vertical minor lobes hardly noticeable.

References

Some information on Corner Reflectors is given in the *A.R.R.L. Antenna Handbook*, and in Terman's *Radio Engineers' Handbook* (McGraw-Hill). Other sources are *Kraus' Antennas* (McGraw-Hill) and a paper by the same author in *Proc. I.R.E. Vol.* 28, p. 513. November, 1940. A complete mathematical analysis, together with a vast amount of information, will be found in *Radio Aerials* by Moullin (Oxford).

New Television Stations

THE B.B.C.'s permanent medium power television station at Meldrum, 20 miles north-west of Aberdeen, came into operation on October 12. The station replaces the temporary low power one which has been in operation at Redmoss (Aberdeen) since December, 1954, and uses the same frequencies (Channel 4). It is anticipated that the new station will cover the whole of Kincardine and those parts of Moray, Banffshire, Aberdeenshire and Angus north-east of a line running roughly from Burghhead to Brechin and Montrose.

* * *

Belling & Lee Ltd. are now transmitting from the I.T.A. site at Lichfield using the call-sign G9AED. Times of transmission are: Mondays to Fridays, 10 a.m. to 1 p.m., 3 p.m. to 6 p.m. and 7.30 p.m. to 8.30 p.m. Saturdays 10 a.m. to 1 p.m. There will be no transmissions on Sundays or Bank Holidays.

* * *

An experimental television service in the Channel Islands started on October 3 from a B.B.C. station at Les Platons, Jersey. The station operates in Channel 4 and receives the programme by radio from the temporary transmitter at North Hessary Tor in South Devon or alternatively from the more distant station at Wenvoe in Wales. Until North Hessary Tor is working on full power early in 1956 it is expected that there may be times when propagation conditions will make reception from the mainland unsatisfactory. When this occurs, a local test signal will be radiated so that viewers know that the fault is at the station and not in their receivers.

Eurovision between Seven Countries

NOW that Eurovision is established on a permanent basis it is estimated that up to sixteen million people in Britain, France, Italy, Switzerland, Western Germany and Berlin, the Netherlands and Belgium, are able to see the programmes simultaneously. The radio and cable links in the U.K. bring the programmes within reach of nine-tenths of the population and amount to 1,200 miles. The radio links across the English Channel to Cassel in France and to the various continental transmitting stations amount to 4,400 miles.

Empire DX Certificate Holders

IN the list of Empire DX Certificate holders published in the July issue of the BULLETIN, the entry for G. A. Bird (G4ZU) should have shown Mr. Bird as the holder of a telephony certificate.

An Introduction to Amateur Transmitting

Part 8—Telephony Operation

By LORIN KNIGHT, A.M.I.E.E.*

EVEN though he may be initially limited to telegraphy transmissions, the newcomer will probably have intentions of eventually operating on telephony as well. When building a transmitter, therefore, he may wish to allow for its later conversion to telephony and to have some idea of what this may involve.

Anode Modulation

The commonest method of modulating a telephony transmitter is by simple amplitude modulation (A3). This, as we saw earlier in the series, uses the speech waveform to control the amplitude of the r.f. signal. A popular way of achieving this is to amplify the audio frequency voltage which appears across the microphone and to superimpose this amplified voltage on to the h.t. voltage of the r.f. power amplifier by means of a transformer as shown in Fig. 31. It is a useful characteristic of a class C amplifier that the output voltage is directly proportional to the h.t. voltage and the shape of the r.f. envelope is, therefore, a faithful replica of the a.f. waveform.

When, as in Fig. 32(b), the modulated h.t. supply swings between zero and double its unmodulated level the modulation is said to be 100 per cent. If the modulating voltage is greater, as in Fig. 32(c), the anode of the r.f. valve will periodically be driven negative. The abrupt cuts in the r.f. output which this causes will produce modulation frequencies much higher than those present in the original speech waveform and these will cause "splatter" to be radiated perhaps as much as 50 kc/s either side of the signal. The aim, therefore, with an amplitude-modulated transmitter is to maintain the modulation percentage as high as possible without running the risk that it will exceed 100 per cent. For the most satisfactory results, it is advisable to have some form of modulation monitor. In its simplest form, this can be a meter which reads the peak amplitude of the a.f. voltage on the secondary of the modulation transformer. Alternatively, a simple oscilloscope can be used actually to look at the modulated r.f. output.†

When amplitude modulation is applied to the p.a. the mean r.f. output power is increased, and in the case of anode modulation this extra power is supplied by the speech amplifier. For 100 per cent. modulation the speech amplifier must supply an a.f. power equal to about 50 per cent. of the total d.c. input power to the p.a. valve. Thus, in the example shown in Fig. 31, the total of the anode and screen currents might be 0.08 amps at 350 volts. The d.c. input power would then be 0.08 x 350 or 28 watts and thus the required a.f. power would be about 14 watts.

The Speech Amplifier

The speech amplifier shown in Fig. 33 is capable of giving up to 24 watts of a.f. output and is representative of what might be used.

Assuming that the microphone is of the crystal type, the a.f. voltage appearing across it will be of the order of 0.01 volt. V1a and V1b amplify this to give something of the order of 1 volt at the grid of V2a. V2a and V2b provide two equal output voltages of opposite phase and form what is known as a "phase splitter". The amplified output of V2a appears across R12 and R14 in series and the portion of this voltage across R14 is applied to the grid of V2b. Thus, the output of V2b is in the opposite phase to that of V2a.

The output voltage from V2b appears across R13 and R14 in series and that part of this voltage across R14 opposes the voltage there from V2a, thus reducing the signal applied to the grid of V2b. The effect of this is to regulate the input voltage applied to V2b in such a way that the outputs from V2a and V2b are approximately equal.

The output valves are operated in class AB1. This

*28 Glebe Road, Letchworth, Herts.

†"Checking A.M. 'Phone Operation", *The Radio Amateur's Handbook*, 1955 Edition, pp. 269-275.

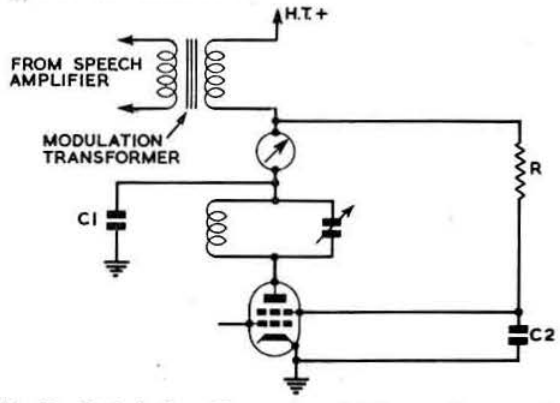


Fig. 31. Method of applying anode modulation to the p.a. valve. With a triode, R and C2 would be omitted. With a tetrode, the system is more correctly described as anode and screen modulation. The values of R, C1 and C2 can be the same as for an unmodulated stage except that C2 should not be greater than about 0.001μF.

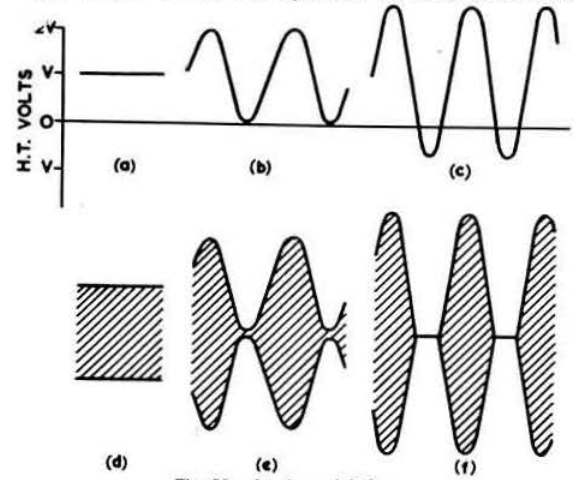


Fig. 32. Anode modulation. (a) Unmodulated h.t (b) H.t. with superimposed a.f. to give 100 per cent modulation. (c) H.t. with superimposed a.f. to give 150 per cent modulation. (d), (e), and (f) show the waveforms of the resultant r.f. outputs.

means that the grid bias voltage is somewhat higher than for class A operation. With a single valve this would result in some distortion but with two valves in push-pull, the distortions tend to cancel out and the net effect is that greater power output can be obtained. With class AB1 operation, the screen current fluctuates fairly violently with variations in input. The screens are therefore fed *via* a voltage stabilizer tube V5 which gives a constant drop of 90 volts regardless of the current.

The resistors R18 and R19 introduce some negative feedback from the anodes of V3 and V4 to the anodes of V2a and V2b respectively. The effect of this negative feedback is to reduce the gain and the distortion in the output stage.

The Modulation Transformer

The load resistance which is imposed on the modulator by the p.a. valve is found by dividing the h.t. voltage of the latter by the h.t. current. In the case of our example, therefore, the load would be 350/.080 or 4,375 ohms. Now the recommended anode-to-anode load for two 6L6s operating as shown is 9,000 ohms and therefore the windings on the modulation transformer must be such that when a resistance of 4,375 ohms is placed across the secondary the primary appears to have a resistance of 9,000 ohms. Making use of the fact that the turns ratio of a transformer is equal to the square root of the impedance ratio, this gives us a required turns ratio of $\sqrt{9000/4375}$:1 or approximately 1.4:1.

Commercial modulation transformers are available which have tapped primaries and secondaries. The novice would be advised to use one of these rather than attempt to modify some other transformer for the purpose.

Compressing the Frequency Band

It is a characteristic of speech waveforms that a large proportion of the power consists of frequencies below 200 c/s but that these frequencies do not add to the intelligibility of the speech. Many amateurs, therefore, attenuate the lower audio frequencies. They are then able to increase the a.f. gain and obtain more power at the useful frequencies for the same total power. Suppression of the bass frequencies can easily be achieved by choosing a suitably small value for one of the coupling capacitors. Thus, in Fig. 33, C1 could be reduced to 0.005μF. This would reduce the voltage gain by about 2:1 at 100 c/s and by about 4:1 at 50 c/s.

It is also desirable to cut off all frequencies above 3000 or 4000 c/s so as to restrict the range of sidebands which is radiated. The outer sidebands will usually not be required by the person listening to the transmission because he will usually have the bandwidth of his receiver set to accept only 2 or 3 kc/s either side of the carrier, in order to reject any adjacent signals, in which case all the sidebands further than 3 kc/s away are doing is to interfere with someone else.

Suppression of the higher frequencies can be obtained by adding capacitors across either or both windings of the modulation transformer. The most suitable values will have to be found by experiment but will usually be between 0.001 and 0.01 μF.

Speech Clipping

Some amateurs include special circuits to clip the negative peaks within the modulator, and follow these with special filters to remove the high frequency components thus formed before the modulation reaches the p.a. valve. This allows the transmitter to work with what is effectively over 100 per cent. modulation without causing any splatter. Since these speech clipper circuits, as they are called, change the shape of the waveform they introduce some distortion. Nevertheless, it is possible to obtain a considerable increase in the effective modulation percentage before the distortion becomes apparent.

R.F. Feedback

In a telephony transmitter, some care must be taken to ensure that r.f. voltages do not enter the early stages of the speech amplifier. The valves in the speech amplifier might demodulate this r.f. and reproduce the original a.f. waveform, thus producing feedback which would cause distortion or howls. It is essential, therefore, to keep the early stage, or stages, fairly well screened from the rest of the transmitter and to use screened lead from the microphone to the grid of the first valve.

Bibliography

More about anode modulation can be found in *The Radio Amateur's Handbook* and *The Radio Handbook*. Much useful information about the design of a.f. amplifiers appears in the *Radio Designer's*

(*Continued on page 179*)

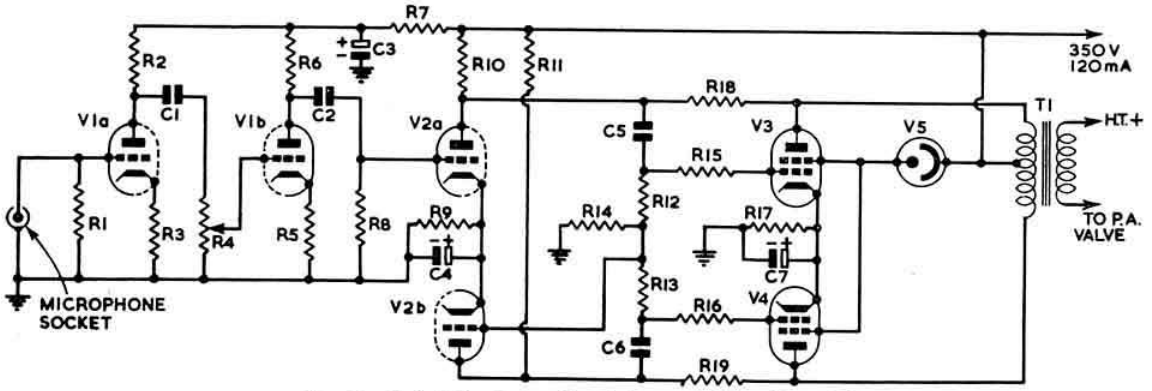


Fig. 33. Typical Speech Amplifier giving up to 24 watts output.
C1, 2, 5, 6, 0.02μF; C3, 8μF 450V wkg.; C4, 50μF 12V wkg.; C7, 25μF 50V wkg., R1, 18, 19, 2.2 Megohms; R2, 6, 10, 11, 100,000 ohms; R3, 5, 9, 1500 ohms; R4, 250,000 ohms volume control; R7, 47,000 ohms 2 watts; R8, 12, 13, 14, 220,000 ohms; R15, 16, 22,000 ohms; R17, 250 ohms 6 watts; T1, Modulation transformer (Woden UM1, etc.); V1a, b, V2a, b, 12AU7 or ECC82; V3, 4, 6L6, KT66 or EL37; V5, 90C1.

TWO METRES AND DOWN

By F. G. LAMBETH (G2AIW)*

THE V.H.F. Meeting held at the Grosvenor Hotel, Manchester, on September 17, under the auspices of the North Western V.H.F. Amateurs, was an unqualified success. The proceedings opened at 2 p.m. with the usual "signing in" and was followed by a visit to Ringway Airport, where more than 30 visitors were given a very good display of G.C.A. with associated radar and film recording units. The Control Room was also visited and thanks are due to the Airport Staff concerned for their assistance in describing the various items of interest.

Conversation never flagged during the whole of the period up to dinner at which the chair was taken by Austin Forsyth, O.B.E. (G6FO), Editor of *Short Wave Magazine*, who made a short speech of welcome. Bill Sykes (G2HCG) gave a detailed analysis of his latest portable skeleton slot aerial. In the course of his talk, G2HCG answered many questions on the operation of slots and slot beams. There ensued two draws for prizes during which G5ML became the possessor of one of the most expensive *Radio Amateur's Handbooks* on record!

It was pleasing to notice a goodly number of amateurs from long distances. Both EI2W and G5YV made good their promise to be present: G4KD (President, International V.H.F. Society) and many other v.h.f. stalwarts were there, whilst a great ovation was given to F9CQ who came all the way from Paris. Lancashire was there in force including Regional and County Representatives G2AMV and G2ART. Yorkshire was well represented. From the London area came G2UJ, G2AIW, G2AHL, G2FKZ and G3FZL.

A great feature of the proceedings was the 2 m station in the hotel, which was in great demand with the mobiles, who were "talked in" and "talked out" as the occasion arose. The station was kept very busy most of the time, and much praise is due to the operating and logging staff with special mention of G3JZN, who appeared indefatigable.

The total attendance was 107, a very creditable performance which certainly shows that the North-Western Area is a hive of interest. None of the foregoing could have gone so smoothly without careful organisation, and the thanks of all go to the Committee and especially to its leading lights, G3GB, G3AGS, G3IEA, and by no means least, G8SB, who must have worked really hard. A small trade and equipment exhibition was an added attraction.

European Two Metre Contest

The European Two Metre Contest which took place on September 3-4 was marred by poor conditions. A few Continental stations were worked by Gs but very few QSOs were had at a greater distance than 200 miles. Some reports speak of fair conditions, however, and good hauls were made by several stations. One comment heard was that the method of scoring in this case was far easier than most to deal with. A criticism since put forward is that under poor conditions stations in sparsely populated areas stand no chance whatever of turning in good scores, and that some provision in scoring should be made for them in the future.

Certain matters having arisen regarding contest rules and general v.h.f. liaison within Region I, I.A.R.U., it is proposed that a meeting of v.h.f. editors be held in the near future either in Paris or Brussels. The writer hopes to be present.

Second 420 Mc/s Contest

The first leg of the 420 Mc/s Contest (September 11) led to a few DX contacts, in some of which G3IOO (Oswestry) was involved, but nothing outstanding emerged. Stations up to 100 miles were heard and worked but conditions which had been fair to good in the morning deteriorated later. Better luck next time.

"SP1AC"

From DL3FM (the D.A.R.C. V.H.F. Manager) it is learnt that the call SP1AC, heard recently on 2 m, is unknown in Poland and is accordingly to be considered as a "pirate."

Cumulative Activity Competition

We have noticed in *CQ Magazine* particulars of a monthly competition which seems very suitable for 2 m, depending as it does on activity level as much as on operating prowess. If it is desired to have a competition here on similar lines, we should call it the "Cumulative Activity Competition." Incidentally no N.G.R.s or anything like them are involved. Full details in our next issue.

International V.H.F. Society News

The Irish Perpetual V.H.F. Trophy for 1955 has been awarded to Mr. W. H. Parker (now G2ADZ) for his outstanding work on v.h.f. during his sojourn in Wales as GW2ADZ. A new Trophy presented to the Society by a Scottish member and to be known as the "Millan Trophy" has been awarded to Mr. T. A. Gallivan (EI4E) of Killarney in recognition of his perseverance over many years on 2 m in a most difficult location, eventually making contact with G2ADZ and G3GPT. The trophy was presented to Mr. Gallivan at an I.V.H.F. Society luncheon in Dublin on September 30. The luncheon, organized by Mr. H. L. Wilson (EI2W), was attended by the President of I.V.H.F.S. (Mr. Thorogood, G4KD), the President of the R.S.G.B. (Mr. H. A. Bartlett, G5QA), Past President Mr. W. A. Scarr, G2WS, and the General Secretary (Mr. John Clarricoats, G6CL).

The Month on Two

Conditions during the period covered by this report were rather flat, although quite an amount of G-DX was noted, as well as a number of Continentals, mainly PA, ON and F. With a deterioration in the weather around September 11, activity slumped, but towards the end of the period, G-DX had appeared again, stations up to the extreme North of England being worked. On September 20-21, G3WS (Chelmsford) was heard working GM3EGW, which may be a preliminary to better things again! Now for some individual reports.

*21 Bridge Way, Whitton, Twickenham, Middlesex.

First, the B.R.S. reports from '3003, '6327, '16075 and '19162. **'3003** (Coulsdon) now has a 12-element stack on a 30ft lattice mast and a general improvement has been noticed. Several new DX stations have been heard. **'6327** (Earlsfield) has "missed what DX there was" but still sends a fair list. **'16075** (Shirley, Southampton) has heard a number of rare stations (for him). G5OB is now active on 'phone and c.w. and would appreciate reports from B.R.S. members more than 25 miles from Southampton. B.B.C. f.m. is well received but tests on Band III TV shows patchy results in various parts of the district. Fading, however is not so heavy as on 45 Mc/s under average conditions. **'19162** (Dewsbury) heard G3FAN (Ryde, I.o.W.) for the first time on August 22 and his first French station (F3LQ) on August 24. A J-Beam 4-over-4 slot beam is now in use indoors and has certainly improved locals, although no extensive trials have yet been made.

G4JJ/P/A is more than ever certain that 2 m success consists of 5 per cent perspiration, 5 per cent efficiency and 90 per cent location, so much so that he is packing up 2 m at Barnsley and taking all the gear to the /A QTH in Derbyshire. 8 watts and a pair of slots only 10ft high gets '4JJ/A into London (150 miles away) at any time. Full power and a high aerial could never do this from Barnsley.

G2HIF (Wantage) suggests that club transmitter activity in the coming winter should include 2 m equipment and says if the members boggle at constructing v.h.f. gear, why not prevail on someone to bring their /P equipment! '2HIF has been "improving" his gear, not always to his liking seemingly. **G3JGJ** (Plympton) has been working and hearing a number of stations as far afield as Salisbury and London one way and Cornwall the other. Activity has been low, however.

G3BPM (Sunbury-on-Thames) using 10 watts to a 4-element Yagi 15ft high reports for the first time. The QTH is not good (40ft a.s.l.) which makes the results creditable. **G2AHP** (Perivale) has been rebuilding, and is now on the air again with a new transmitter (832 final) which has already acquitted itself well. Stations in Bristol, Monmouth and Yorkshire were early QSOs and 8 counties were quickly worked. It is hoped this new rig will allow '2AHP to work during television, now so greatly extended. **G3EMU** (Canterbury) has been doing a little better, working G6XM (York) which is most unusual for him—Essex is usually his northern limit! '3EMU thinks conditions were good during the European Two Metre Contest, with more activity than usual. With regard to QSL cards, '3EMU thinks some of our v.h.f. "experts" should be more forthcoming, so what about it? **G3KHA** (Bristol 4) is now on 145.512 Mc/s, with an input of 30 watts to a QQV06/40A. The receiver is a G2UJ type with a cascode in front which flattens the gain over the range. The aerial is now motorised.

G5MR (Hythe, Kent) very much enjoyed the European Contest, in which activity was high throughout; many French stations were worked, but '5MR was not so lucky with British stations, which is usual for his QTH! The best DX was F3GL (Auxerre, Yonne) at 252 miles. HB1RD was heard several times peaking to S6 but could not be raised. Apart from the Contest, little else has been done on the air. **G8VN** (Rugby) found September 10-11 unusual in that only Lancashire signals were audible. Several were worked on 'phone at good strengths but others were heard less strongly. The following night '8VN had a good QSO with G5UF (Dorchester) who has returned to the band after a long absence, but finds activity low in the South. '8VN asks if the Ladder is to commence at 14 Regions—no, the rules are unchanged, those published last time were the only entrants. Anyone interested is asked to send the score along.

Regional V.H.F. Ladder

TWO METRE BAND 1955/6

Psn.	Call & Location	Worked Regions	Worked Countries	Worked Stations
1.	G5YV ..... *Leeds, Yorks.*	15	13	268
2.	G2AIW ..... *Twickenham, Mx.*	15	12	93
3.	G6XX ..... *Howden, Yorks.*	15	9	48
4.	G8IL .... *Winterslow, Wilts.*	14	10	103
5.	G6TA ..... *Streatham, London*	14	9	146
6.	G3CCH ..... *Scunthorpe, Lincs.*	14	5	43
7.	G3DO..... *Sutton Coldfield, Warks.*	10	4	47

G3WW (Wimblington) has had a varied and full month of operating on both 2 m and 70 cm. In the European Contest '3WW considers that any U.K. amateur who did not see an actual copy of the rules had no chance of success because of important omissions in the precis, particularly the fact that second contacts were permissible. Richard seems to have been "county-chasing" again, and has certainly done well up to the present. G3IIT and G3GGJ appear to be the only stations operative nightly in or near Cambridge. September 19 saw the band full of signals from many parts of the country, and it was impossible to work them all. The Midlands and West were well represented. '3WW asks if the Ladder could not consist of (1) Regions, (2) Counties, (3) Countries and (4) Total number of stations worked, with "of course" a large handicap for G5YV, '6NB and '3GHO!!

G8LN (Plumstead) has had aerial and mains trouble, in fact the accumulation of bothers would dishearten many! A temporary dipole is holding him on 2 m and the 40-mile sked with G3ANB has been kept—it was nearly as good as on the beam! '8LN notes with pleasure the fresh calls appearing on the band. **G2CZS** (Chelmsford) has had some new firsts including a contact with Lancashire; he heard G3IVF (Derbyshire) and '3JWQ (Ripley) for the first time. West Country stations have been in evidence again lately, some also for the first time.

G3ACC (Dulwich) is coming on 2 m and is already listening on the band using an indoor aerial and a G2UJ type converter. She is "struggling" to modify a "522" for transmission. Welcome to the band, Margaret.

G3HHY (Bristol 6) has an excellent QTH clear in all directions except north-west, and hopes to be back on 2 m before very long. Portable working is envisaged later from Cardigan and Pembrokeshire. **G6YP** (Orpington) has sent a very interesting account of his visit to F9CQ (St. Valery-en-Caux) who operates from a German "blockhaus" on the cliffs about 1 m west of St. Valery and 250ft up. The blockhaus is in two sections, the top one, a kind of observation tower, being used for operations. There is no interference of any kind and

LONDON U.H.F. GROUP

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,

at 7.30 p.m., November 3, 1955.

All u.h.f. enthusiasts welcome.

the situation is ideal. During the period August 16-25 the barometer remained practically steady, with very little wind. The humidity, which is very important, could not be measured, but it was noted that when transmission was less good than usual the humidity was less also as shown by the degree of moisture condensation on the cars parked in the field. No PA0 stations were heard during the period but some fine contacts with stations in Belgium and the centre of France (Paris being commonplace) were made. This is interesting, because transmission southward from the blockhaus is over a vast plateau, any advantage of height (as to the north) being nullified. Many British 2 m and 70 cm operators have been the guests of F9CQ, '8MX, '9RL and '9NW, and would like to express their deep appreciation of the wonderful hospitality.

EI2W (Dublin) reports that on the night of August 13 conditions were reasonably good for working Lancashire, but no signals were heard from the south. G6DP (near Manchester) was worked for the first time. On the 14th a few Scottish signals were coming through, notably GM3EGW, GM3BDA/A and GM3IBV. On September 3-4 conditions were very poor in Ireland, only twelve stations being worked during the two days of the European Two Metre Contest, the most distant being G3WW and G6NB. EI2W will be on during the winter months, both on 2 m and 70 cm.

G3NT (Northallerton) is running 15 watts to a 4-element Yagi at 40ft. Frequencies are 144.126, 144.270 and 144.324 Mc/s.

G6XM (York) made full use of the good spell from August 20-30, the best contacts being with G2BAT (Falmouth), F9CQ (St. Valery), F3JN (nr. Paris), GC3EBK (Guernsey), G3XC/P (Plymouth) and many Scottish stations. '6XM will shortly be re-building, and hopes also to come on 70. His present 2 m p.a. valves (Western Electric 304As) have been giving yeoman service since 1936, apart from the war period. '6XM asks: " Has anyone used a rhombic on 2 m or 70 cm?" **G5CP** (Chesterfield) reports that several new stations have appeared on 2 m including G3FUA and '3JWQ (Ripley, Derbys.). G3FGY will be active soon. **G6XX** (Howden) worked F3LQ on August 24 but could not raise the GCs although GC3EBK was heard strongly. G2ADZ (Woolacombe) was worked on August 25-26. Many Scottish stations, including GM3GMX (both in Angus and Aberdeenshire) have been contacted, and the Continentals well received. We hear that the Cornish stations are active at 21.00 GMT each evening and stations are invited to turn their beams to the south west, where G2BAT, '3AET, '3AGA and '3HZH await them.

Scotland. GM2FHH took the opportunity of meeting the Glasgow R.S.G.B. Group recently and was told by GM6ZV and '6WL that apparently very few of the summer openings reached as far as Glasgow. The 2 m band has been very dead in the Aberdeen Area lately.

Wales. GW8UH (Penylan, Cardiff) has a very similar plaint. The latter part of August was good but since then hardly anything has been heard, except on September 11.

HB9RO regrets that he and HB8RM were unable to work on v.h.f. bands this summer as promised. They ask for patience until next Spring, when they will be operative on 2 m and 70 cm with 100-120W c.w., 90W 'phone on 144.1 and 432.2 Mc/s.

Seventy Centimetres

G3HBW (Bushey Heath) now has a dual aerial up outdoors again, the 70 cm component being an accurately matched 16-element stack, on which 15 stations were worked during the period September 10-11, the best DX being G3GZM/P (Clee Hill, 115 miles) and G3IOO (Oswestry, 145 miles) under quite poor conditions. G2XV (Cambridge) is always S9+ at 43 miles. On September 20, QSOs were had with G2FNW (Melton Mowbray) (58-9 'phone, 599 c.w.) and G5YV (589-59-79).

G2XV (Cambridge) wants a Countries Worked list for 70 cm—he claims 5 (G, GW, PA, ON and F)—having now contacted F9CQ. In the contest (September 10-11) the first hours were good and G3JHM (about 100 miles away) was heard but could not be raised, although his neighbour at Littlehampton was a good contact at 569. G2WJ and 3CGQ were called but not worked: 14 QSOs were made and G3HBW was like a local station throughout, irrespective of beam position.

G3WW (Wimblington) has heard F9CQ several times and succeeded in working him on August 22. G3IOO was also hearing F9CQ at 559 c.w. when working '2BVW. '3WW asks, why don't the " keen " members of the London U.H.F. Group listen for signals coming from outside London other than to the south (excluding G2HDZ, '2HDY and '3KEQ)?

Worked and Heard on Two

Due to pressure on space the rules for the " Worked and Heard " lists are being changed. In future, will you please confine your reports to G-DX over **100** miles and to E-DX.

What Do You Know?

1. What is a counterpoise?
2. Which way does the current flow in a circuit?
3. What does the term " superhet " mean?
4. How many letters are considered to make an average word for estimating code speed?
5. Who was the founder of the American Radio Relay League?
6. Why does a passing aeroplane not cause " flutter fading " on the longer wavelengths?
7. Why are power transformer cores made of laminated iron?
8. Why was 6.3 volts chosen as a standard heater voltage?
9. Who invented the tuned circuit?
10. What is the difference between a super-regenerative receiver and a quench receiver?
11. What is a " jar "?
12. What is a C-battery?
13. Why does excessive anode current in a valve cause the anode to become red-hot?
14. Why do some modulation transformers " talk back "?
15. What is the direction of the shortest line from England to (i) Central America; (ii) Sydney, Australia?
16. What metal when introduced into the field of a coil will reduce its effective inductance?
17. Why is it impracticable to solder aluminium by the ordinary method?
18. Why are 1,000 metres and 440 metres of special significance?

Answers to these questions will be found on page 183

Worked and Heard on Two

B.R.S.3003 (Coulsdon, Surrey) August 18–September 18.
Heard: F9CQ/A, 3LP, 3LQ, G2BMZ, 2CZS, 2HCG, 2WJ, 3DLU, 3DIV, 3FAN, 3FFV/M (nr. Brentwood, Essex), 3FIH, 3GHO, 3GOP, 3GKR/P (nr. Ditchling Beacon), 3IEW/P (South Downs, Eastbourne), 3IEX, 3INU, 3ION, 3YZ/P (5 miles south of Cheltenham), 3WS, 3WW, 5BD, 5UF, 6CW, 8IL, GC3EBK.

B.R.S.6327 (Earlsfield) August 21–September 18.
Heard: G2ATK, 2BVW, 2HCG, 2VA, 3BSU, 3DLU, 3FAN, 3FIH, 3FQS, 3GHO, 3ION, 3YZ/P, 4JJ/A, 4JR, 4PS/P, 5UM, 5VN/A, 6NB.

B.R.S.16075 (Southampton) August 14–September 18.
Heard: G2ADZ, 2BMZ, 2DDD, 2DVD, 2HCG, 3AGA, 3AUS, 3CBU, 3GVF, 3ITF, 3JUG, 3MU, 5UF, 6AG, 6AG/M, 6NB, 6OX, GC2FZC, 3EBK.

B.R.S.19162 (Dewsbury, Yorks.) August 18–September 14.
Heard: F3LQ, G2ATK, 2BVW, 2DJM, 3FJR, 3HOP, 3BA, 3DJX, 3FAN, 3GPT, 3GSO, 3HZF, 3JNI, 3KFD, 3NT, 3WS, 3WW, 4BD, 4JJ/A, 5ML, 5TZ, 6CW, 6NB.

F9CQ (St. Valery-en-Caux) August, 1955.
Worked: F3FS, 3JN, 3LP, 3ND, 3NJ, 3SK, 3WH, 3YE, 8AA, 8FA, 8GH, 8HL, 8HW, 8LG, 8LO, 8ME, 8MW, 8MX, 8NH, 8NW, 8OB, 8RK, 9AJ, 9DQ, 9EA, 9EA/P, 9JI, 9NN, 9NW, 9QE, 9RL, G2JF, 2JT/P, 2RD, 2WJ, 2XV, 2AIW, 2AIY, 2ANS, 2ATK, 2BRR, 2BVW, 2CVD/P, 2DDD, 2DSP, 2DVD, 2FJR, 2FTS, 2HCG, 2HDZ, 3WS, 3WW, 3ABA/P, 3ANB, 3AUS, 3DGI, 3DIV, 3EJO, 3ENY, 3EOH, 3FAN, 3FGT, 3FQS, 3GGJ, 3GPT, 3GSE, 3HXS, 3IUL, 3JHM, 3KEQ, 4AU, 4GT, 4IB/M, 4JJ/A, 5BD, 5DS, 5KW, 5KW/M, 5LK, 5ML, 5MR, 5RD, 5RO, 5TZ, 5YV, 6AG, 6AG/M, 6CW, 6NB, 6OU, 6OX, 6RH, 6XH, 6XM, 6YP, 6ZP, 8AL, 8DA, 8DM, 8KW, 8KW/M, 8KZ, GC3EBK, GW8UH, ON4BZ, 4GN, 4HN, 4TW, 4UD, PA0FB.
Heard: F3GL, G2ADZ, GM3BDA/A.

G2CZS (Chelmsford) August 21–September 19.
Worked: F9CQ, G3CKQ, 3GOP, 3GPT, 3IEW/P, 3JEP, 3JGY, 4JJ/A, 5UF, 6OU, 6XH. *Heard:* F3LQ, G3DLU, 3ENY, 3ION, 3IVF, 3JWQ, 3KEE, 4GR, 5BM, GC3EBK.

G2DHV (Blackheath).
Worked: G2VB/P, 3DVQ/P, 3JMA, 6XH, 8UQ/P. *Heard:* DL1EY, 3VJ, EI2W, F3CQ, 3LT, 9JY, 9CQ, G2BDP, 2BAT, 2DSP, 2DVD, 2FNW, 2FTS, 2WJ, 3ABA/P, 3BJQ, 3BA, 3DLU, 3DMU, 3FGT, 3FAN, 3FSD/M, 3GHO, 3GCX/P, 3GWB/P, 3ION, 3INU, 3JHM/P, 3JDN, 4JJ/P, 4IB/P, 4PS, 5CR, 5MR, 5TZ, 5RD, 5YV, 6NB, 6OU, 6WF, 6WM, 8IL, 8PX/P, 8UQ/P, GC3GOP/P, GD3UB, GI3GXP, GM2FHH, GW3GWA, HB9IV, ON4BZ, 4IE, 4UD, PA0QF.

G3ACC (Dulwich) August, 1955.
Heard: G2KD, 2HDY, 3BRX, 3DGI, 3GMA, 3JXN, 4AU, 5KW, 5KW/P (10 miles s.e. of Croydon), 5TZ, 6AG/M (Well Hill), 6NB, 6XH, 6YP.

G3BPM (Sunbury).
Worked: F3LQ, G2CVD/P, 3DLU, 3FAN, 3FPV, 3YZ/P, 4JJ/A, 5TZ, 5UM, 5YV, 6XM, 6ZP, 8IL, 8PX, GW8UH. *Heard:* F9CQ, G2BMZ, 2DVD, 2DWW, 3EPW, 3GHO, 3GVK, 3WW, 4PS, 6XX, 8KW/P (nr. Clacton), PA0FB.

G3EMU (Canterbury) August, 1955.
Worked: DL3QA/P, F8GH, 9DI, G2JF, 2VA, 3ANB, 3GHO, 3HSM, 3IEW/P, 3IEX, 3ION/P, 3JNI, 3WS, 5MR, 6XM. *Heard:* F8LO, 8LQ, 9CQ, G2HCG, 3DIV, 3MP, 3WW, 5KW/P, 5TZ, 6AG, 6NB, 6RH, 8IL, ON4BZ, 4HH, PA0FB, 0FC, IPL.

G3JGJ (Plympton) August 21–September 16.
Worked: G3XC/M (Plymouth/Callington), GW2ACW. *Heard:* G2ADZ, 2BAT, 2BMZ, 3AGA, 3AUS, 3FIH, 6TA, 6XX, 8IL, GW8UH.

G3KHA (Knowle, Bristol) July 20–September 18.
Worked: G2UJ, 2YB, 2YC, 2ABD, 2ADZ, 2AHP, 2AIW, 2BAT, 2BRR, 2CZS, 2DVD, 2HIF/P (Blandford), 3MA, 3WS, 3BII, 3DJX, 3EPW, 3FAN, 3FZL, 3GHO, 3GOZ, 3GPT, 3GSE, 3GVF, 3HWJ, 3IIT, 3ITF, 3JHM, 3KEQ, 4AP, 4PS, 5DS, 6AG, 6NB, 6OX, 6RH, 6WU/P (Minehead), 6XM, 8AL, 8IL, 8UQ/P (nr. Basingstoke), GW2ACW. *Heard:* F3LQ, 8AA, 9CQ/A, G2JF, 2MV, 2XV, 2BMZ, 2DSP, 2DTO, 2FJR, 2HCG, 2HDZ, 2HOP, 3FD/A, 3MI, 3SM, 3VI, 3WW, 3XC, 3XC/M, 3YZ/P, 3AEX, 3AGA, 3ANB, 3AUS, 3BPM, 3CLW, 3DGI, 3DOV, 3EGV, 3EYV, 3FGT, 3FMI, 3FMO, 3FNL, 3FPV, 3FQS, 3FRG/P (Devils Dyke, Sx.), 3GGJ, 3GHU, 3GJZ, 3GOP, 3GOP/P (Dorset), 3HBW, 3HGY, 3HXS, 3HZF, 3IER, 3IUD, 3IUL, 3IWJ, 3JGZ, 3JUG, 3JZG, 3JKQ, 3KFD, 4KD, 5KW, 5ML, 5MR, 5OB, 5OB/P, 5RD, 5TZ, 5UM, 5US, 5YV, 6AG/P (Cumberland), 6FO, 6JK, 6OU, 6XH, 6ZP, 8DM, 8KW, 8KW/P (Clacton), 8PX, 8RW, 8SK, 8VZ, GC3EBK, GW3DO/P (Radnor), ON4BZ.

G3WW (Wimblington) August 21–September 20.
Worked: EI2W, F3LQ, 9CQ/A, G2AHY, 2AIW, 2BVW, 2COP, 2DVD, 2FJR, 2HDZ, 2YB, 3BNC, 3CBU, 3CKQ, 3DLU, 3DO, 3DQQ, 3ENY, 3EPW, 3FIH, 3FUL, 3GGJ, 3GHO, 3GPT, 3GSE, 3GVF, 3GXG, 3HAZ, 3HIQ, 3IAM, 3IEW/P, 3IIT, 3IOO, 3IWJ, 3JGY, 3JMA, 3JXN, 3JZN, 3KHA, 3NL/P (Hereford), 4AP, 4JJ/P, 4PS, 5BM, 5KW/P (Kent), 5YV, 6KK, 6NB, 6NF, 6XH, 6XX, 8IL, 8KL, 8KW, PE1PL. *Heard:* G2HCG, 2TP, 3ION/P, 5TZ, 8RW.

G5MR (Hythe, Kent) August 19–September 19.
Worked: F3CA, 3GL, 3JN, 3LP, 3LS, 3WH, 8GH, 8LO, 8ME, 8OB, 9AJ, 9CQ, 9DI, 9EA/P, 9FB, 9MX, G2CVD/P (Worcs.), 2YB, 3CBU, 3DGI, 3GVF, 3IEW/P, 3JMA, 3JNI, 3JXN, 3VI, 5KW/P, 6NB, 6XH, 8IL, 8KW, GC2FZC, 3EBK. *Heard:* DL3QA/P, F3LQ, 8EB, 8FA, 9NN, 9NW, 9QE, G2AIW, 2CZS, 2HCG, 3CLW, 3DIV, 3DJX, 3DLU, 3FAN, 3FD, 3FIH, 3GDR, 3GSE, 3HXS, 3JHM, 3WS, 4AU, 4PS, 5DS, 5NF, 5YV, 6AG, 6AG/M, 6OX, 6RH, 6XM, 6YP, 8AL, 8PX, HB1RD, ON4BZ.

G8VN (Rugby) August 27–September 19.
Worked: G2COP, 2YB, 3CKQ, 3BJQ, 3DKF, 3EJO, 3EPW, 3EYV, 3GHU, 3GPT, 3HHD, 3IIT, 3IOO, 3IUD, 3IWJ, 3JZN, 3KEQ, 5JU, 5UF, 6NB, 6TA. *Heard:* G2CZS, 2FJR, 2HGR, 2NY, 3ASC, 3FAN, 3GHO, 3JZG, 5AU, 5VN/A, 5YV, 6MI, 6XM, GW3GWA.

Seventy Centimetres

G3WW (Wimblington) August 21–September 20.
Worked: F9CQ/A, G2HDZ, 2XV. *Heard:* G3EOH, 3KEQ, 5DT, 8SK.

F9CQ (St. Valery-en-Caux) August, 1955.
Worked: F3LP 8GH, G2RD, 2WJ, 2BVW, 2DDD, 2DSP, 3WW, 3EOH, 3GDR, 3JHM. *Heard:* F8AA, G3IOO, ON4HN.

LONDON MEMBERS' LUNCHEON CLUB

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,

at 12.30 p.m. on Fridays, October 21 and November 18, 1955.

Telephone table reservations to HOL 7373 prior to day of luncheon. Visiting amateurs especially welcome.

London Lecture Meeting

Friday, October 28, 1955

" AMATEUR RADIO IN THE ANTARCTIC—
a Review of VK Activity 1947–1955 "

by

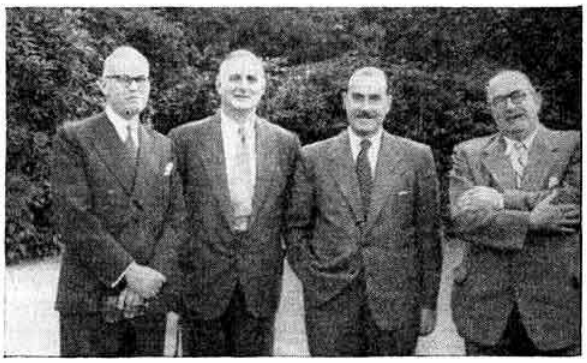
ROTH JONES (VK3BG)

at the

Institution of Electrical Engineers,
Savoy Place, Victoria Embankment

Buffet Tea 5.30 p.m. **Lecture 6.30 p.m.**

The paper will be read by Arthur O. Milne, G2MI (Past President) and will be illustrated by films and slides.



OLD TIMERS

Recently, whilst in Leeds on the occasion of his son's wedding, the General Secretary (right) took the opportunity of visiting old radio friends in the West Riding of Yorkshire. In this picture are Francis Garnett, G6XL, Calverley; Philip Wade, G2BPJ, Leeds; and Charles Sharp, G6KU, Bradford. The latter is the Society's Regional Representative for North-East England. All have been licensed for more than 20 years.

More Early Experiences in Amateur Radio

By G. W. TONKIN (G5RQ, ex-TBX)* .

Following last year's National Convention and Bristol Group's N.F.D. hat-trick, Mr. Tonkin, who was one of the earliest wireless experimenters in Bristol, was invited to contribute these personal reminiscences of the early days of the hobby.

SO far as is known the first contact over the sea was made by Marconi across the Bristol Channel from Lavernock Point, Penarth, to the Flat Holms Island, a distance of 3½ miles, on May 11, 1897. This was closely followed by a similar success from Bath to Salisbury (34 miles).

Early Interest

It was in 1909 that I first began to take notice of the fact that it was possible to send signals without visible means of connection. I made a transmitter with a ¼in. spark coil powered by a 6 volt battery. Brass stair rods were used for capacities. For a receiver I used a Bramley type coherer which was made from iron filings placed between two electrodes in a glass tube with two more stair rods for capacities. With this device signals were sent and received across the dining room table. The date was February 3, 1909. On another occasion, a volt meter was successfully used as an indicator.

Later on, I found that two friends of mine—Reggie Cox and Norman Driver—were also experimenting and I joined forces with them. I can recall that we established communication between Cox's workshop and the coach house. On that occasion we used some sort of vertical aerial. Various coherers were used, one of which was a piece of mirror with a scratch across the silver back.

Licences

Things went on for about a year when I discovered that a licence was necessary. I pointed this out to my two collaborators who received the news with derision. Notwithstanding this, I applied for a licence early in 1910 and after much correspondence it arrived towards the end of that year, designating my station with the call-sign TBX. All experimental call-signs had an X in them, usually at the end. Cox and Driver followed my example and became CDX and DXX respectively.

There was one period when our licences restricted us to working certain specified stations and no others. We were glad it did not last long.

I was not the first in the field in Bristol, however, as Charles H. Tilsley had obtained a licence in June, 1905. He used a 4in. spark coil with the usual Bramley type coherer and succeeded in transmitting signals a distance of about one mile across Bristol. Unfortunately he knew no Morse and did not continue his experiments. What a pity! Other early experimenters in the area were Mr. Sharp (GSX) and Mr. Davis, grandfather of John F. Davis (G3GVJ), but I have no record of their activities.

No fee was charged for licences and there was no examination of any sort, but if an applicant was within 10 miles of the coast, power was limited to 20 watts. Elsewhere, as much as ½ kW was often permitted.

It was of course necessary to make most things. I even made a Bell type telephone wound with No. 47 wire to a resistance of 1000 ohms.

*Ingsdon, Downside, Stratton-on-the-Fosse, near Bath

This picture taken in 1948 shows G5RQ at the operating position of his post-war amateur station.
(Photo by "Bristol Evening World")

On October 31, 1912, we had the opportunity of using a pair of commercially made transmitters and receivers at a bazaar in Bristol where we sent and received messages over a distance of 300ft at sixpence a time. This outfit was listed in the A. W. Gamage catalogue of 1907.

At about this time we began to use various combinations of crystals such as zincite/bornite, galena/graphite, zincite/copper pyrites, etc., for reception. Tuning was also started. Transmitter tuning helixes were made of ¼in. brass rod wound into a huge coil. Leyden jars made of thin glass tumblers and tin foil acted as condensers.

My first aerial, erected in 1912, was a four wire horizontal about 25ft high. A 1in. spark coil running off a 6 volt accumulator was used as the transmitter. As this entailed a lot of charging, I put the 105 volt a.c. mains into the primary of the spark coil, *via* the break and a bank of carbon lamps in series parallel and it worked! The then 93 cycles of the Bristol a.c. mains worked in perfect harmony with the break. There was a great deal of " try it and see if it works " in those days.

Although comparatively small receiver tuning coils were used for 200 metres, one had to make special coils for receiving commercial and government stations from 1000 to 30,000 metres. The coil for the latter measured 2ft long by 9in. in diameter.

A lot of time was spent in listening to these stations. Poldhu in Cornwall on 2800 metres sent news from the daily newspapers and a weather report. Paris transmitted time signals and news in French from the Eiffel Tower on 1680 metres.

Here are a few of the important stations with their call signs:—Clifden, Ireland (CDN); Nauen, Germany (POZ); Warsaw (WAR); Belgrade (RS); Sofia (FF); Budapest (HB); Prague (PRG); Constantinople (OSM); Moscow (MSK); Bordeaux (LY); Paris (FL); Norddeich (KAV). It will be noticed that the call-signs were often letters abbreviating the words. It was not until January, 1913, that a start was made to allot international prefix letters.

More Bristol people began to come on the air in 1913: Harry Griffiths (GXX); H. Lefebure (OIX);

Moineau (ABX); Alan Fawcett (ASX, now G2HQ); Bracher (OXR); H. S. Urch (DXP, now G6DJ); Davis (DXP); Stevens (LXS); Harrison (XBS) and Warry (XXJ).

On January 16, 1913, I had a contact with Cox from my home, a distance of half a mile—DX in those days.

Speech Transmission

Grindle Matthews was working between the grounds of the New Passage Hotel on the shore of the Bristol Channel and a launch at sea. He actually worked speech and created a great sensation in the Press. His co-worker was T. Ditcham. The telephony transmission was heard by Commander Hippisley at Ston Easton Park, near Bath, and by Thomas Ross in London.

In Bristol we had local QSOs and swapped ideas much as we do now on Top Band. The *English Mechanic* and the *Model Engineer* were the only publications which gave any " gen " on wireless. It is true that the *Marconigraph* (the organ of the Marconi Co. which became the *Wireless World* in April, 1913) was an excellent monthly but it mainly recorded the doings of operators and gave descriptions of their stations.

DX At Last!

As yet no-one in Bristol had succeeded in getting his signals outside the city. Then came Maurice Child (NWX) who set up a Wireless School in Baldwin Street with a ½ kW Marconi quenched spark marine set. The first time he used it on the air he blotted out all the telephones in the city! He certainly got out for I worked him myself from the station of the late Rev. C. E. Doudney (DXK) of Bath. Doudney's aerial, incidentally, stretched from the top of his church spire to the Vicarage!

There were several stations around Bristol that we could hear but try as we would we could not reach them so I decided that something must be done about it. Those near to us were Commander Hippisley (HLX), Claude Wilcox (WUX), Warminster; O. H. Bayldon, Newton St. Loe; Russell Clark (THX), Abergavenny.

At last, on April 10, 1914, I had my first QSO with HLX, a distance of 15 miles, using an oil-filled transformer I had bought to replace my one inch spark coil. It stepped up the 105 volts a.c. mains to 4000, 6000 and 10,000 volts. Soon afterwards, I put my signals over to WUX at Warminster—34 miles. This was the longest distance I worked before the 1914 war broke out.

Some of the great men in radio held experimental licences at that time: Dr. W. H. Eccles (EWX); Dr. Erskine Murray (MUX); Dr. Ambrose Fleming, inventor of the thermionic valve (UCX); Philip Coursey (GYX); Sir Henry Norman, Assistant P.M.G.; Wilson Noble (NBX).

I should like to conclude with a story showing the incredulity of people in those early days. Once I was passing Ston Easton Park in a char-a-banc and I told the lady sitting next to me of my contacts with HLX. When I had finished she said, " Yes, but it's only a toy, isn't it "!

A Wide-band V.H.F. Transformer

ON the v.h.f.s it is often required to couple a 300 ohm balanced line to 75 ohm coaxial feeder or *vice versa*. The normal method of effecting such a transformation of impedance and at the same time changing from a balanced to an unbalanced condition is by means of a coaxial transformer known as a " balun ". This device is, however, frequency sensitive and effective only over a narrow band centred on its design frequency.

The transformer to be described is designed to match a 300 ohm balanced source to a 75 ohm unbalanced output over a frequency range of 40 to 235 Mc/s with an insertion loss of not more than .4 db and a standing wave ratio not exceeding 1.3 : 1. The present model is suitable only for use with a receiver or very low power transmitter, but it should be possible to design a transformer on similar lines capable of handling higher power.

From Fig. 1 it will be seen that two bifilar-wound coils are so connected that, looking into the 300 ohm end two coils are in series while the other two coils are in parallel and form the 75 ohm unbalanced output.

To achieve the specified performance it is important that the windings on the two ¼ in. polystyrene rods are as nearly alike as possible. Each former carries two windings of 30 s.w.g. enamelled wire so arranged that the turns of one coil lie midway between the turns of the other, the winding pitch of each coil being twenty-four turns per inch.

Some experimental work is at present going forward with a view to modifying the design for operation at 420 Mc/s and if this is successful details will appear in the BULLETIN.

Attention is drawn to the fact that the transformer is the subject of a patent, and although there is no objection to the idea being employed by individuals for their own use, the device may not be produced commercially without permission having been granted by the patentees.—W.H.A.

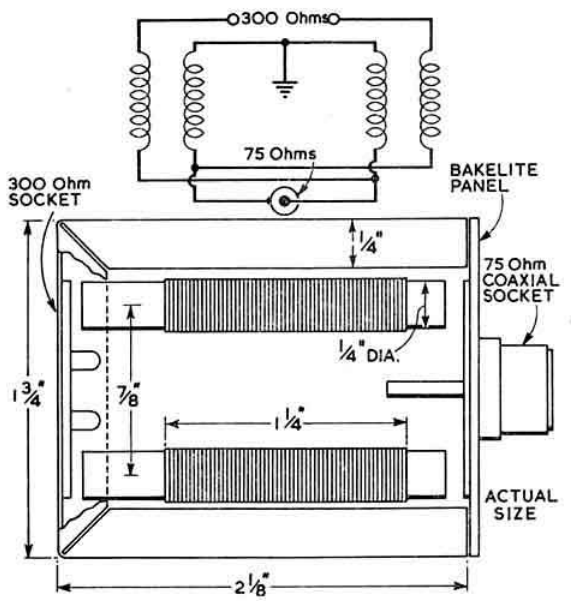


Fig. 1. The wide-band v.h.f. transformer. In the circuit diagram the earth sign indicates a connection to the case. The mechanical arrangement is shown in the lower diagram. Each former carries two windings, each with a pitch of twenty-four turns per inch. The chassis is constructed from 20 s.w.g. brass bent into channel form ⅛ in. deep with ¼ in. lips. A " U " shaped piece of sheet brass, with a hole cut to clear the 75 ohm socket forms the outer case, and is secured by two 8 B.A. screws at the 300 ohm socket end.

CQ Single Sideband

By H. F. KNOTT (G3CU)*

MOBILE single sideband operation has been widely discussed recently by users of the system both on and off the air. The idea has considerable appeal from several points of view; the little extra work entailed in setting up compared with that required for the usual mobile rig is more than compensated for by the extra output per pound weight.

The results achieved by G6HV/M are particularly encouraging. Planning for mobile operation started early in the year and culminated in a 1,440 mile trip round England, accompanied by his wife, who, says G6HV, bore her part with great fortitude and patience.

The complete receiver, exciter and p.a. is built on a chassis 3ft long by 10in. wide, and is fitted into the boot of a Standard Eight. To simplify tuning, two identical filters are employed for the exciter and the receiver. A common oscillator (v.f.o.) is used to heterodyne the s.s.b. signal from the filter frequency to 3.8 Mc/s and as the local oscillator for the receiver, thereby using the same channel for both transmission and reception. The v.f.o./l.o. uses a parallel tuned Colpitts circuit having good mechanical and electrical stability and is built into a unit containing the loudspeaker and control switches, which fits into the left-hand glove compartment. Originally, a crystal microphone was employed but due to extraneous noise picked up it was eventually abandoned and a carbon microphone feeding straight into the balanced modulator substituted. For similar reasons voice controlled break-in was abandoned and manual control fitted.

The p.a. consists of four 807s in parallel with a pi-network tank circuit. H.t. for the screens is fed from the same supply as the exciter; the anodes are supplied from a separate 1200 volt rotary converter, the indicated power input being 150 watts. It may be thought that this would be a heavy load on the battery, but bearing in mind the results obtained the consumption is reasonable compared with A3 mobile rigs in use at the present time. The aerial consists of an 8ft centre loaded whip fed via a rotatable coil unit fitted in the right-hand glove compartment. Co-axial cable is used to link the coil unit to the p.a.

Battery consumption is 10 amps for the receiver, exciter and all heaters, and 20 amps while transmitting with a maximum of 22 amps on peaks of speech. The dynamo on the car can deal adequately with the full drain and after mobile operation fixed working can be carried on for at least two hours without running the battery so low that the car cannot be re-started.

During the tour G6HV/M passed through 21 counties, from Newcastle through the Midlands to Devon and Cornwall, back along the South Coast to London and thence via the main A1 back to Newcastle. Contact was maintained at intervals every day for a week with G3EPL (St. Bees). Signal reports were very consistent, the average being RS57. Two-way contacts while mobile were made with stations in all parts of the British Isles as well as OZ, DL, SM, ON and PA, at signal strengths varying from S9 down to S3. Readability was always R4 or better.

Other stations preparing for mobile s.s.b. operation include G2MF, G3MY and G3CWC.

*15 Hampden Road, Wantage, Berks.

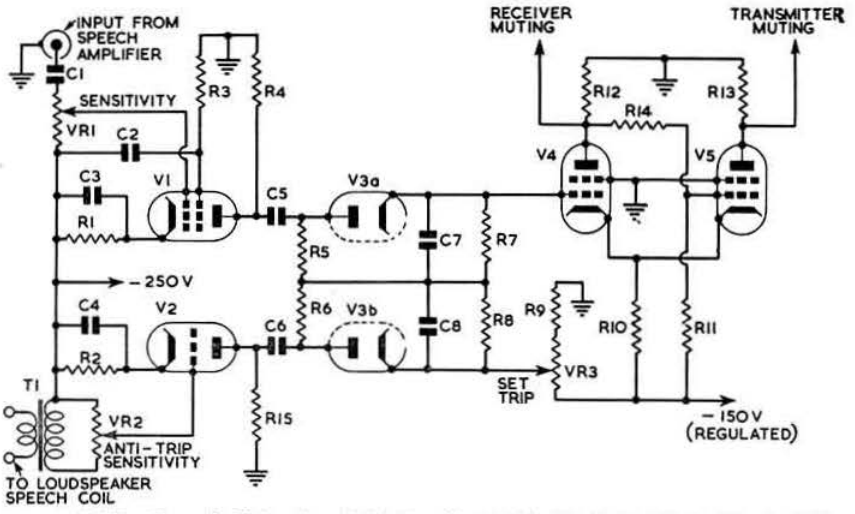


Fig. 1. G3ESV's Electronic Voice Control Circuit. C1, 0.05μF; C2, 7, 8, 0.1μF; C3, 4, 25μF; C5, 6, 0.01μF; R1, 500 ohms; R2, 1000 ohms; R3, 150,000 ohms; R4, 15, 50,000 ohms; R5, 6, 500,000 ohms; R7, 8, 14, 2.2 Megohms; R9, 12, 13, 20,000 ohms; R10, 3000 ohms; R11, 250,000 ohms; T1, pentode output transformer (broadcast type); V1, 6SH7; V2, 6C4; V3a, b, 6AL5; V4, 5, EF50 or EF91; VR1, VR2, 250,000 ohms; VR3, 10,000 ohms.

Other stations preparing for mobile s.s.b. operation include G2MF, G3MY and G3CWC.

Twenty Metres

Although conditions have not been ideal on 14 Mc/s recently, s.s.b. has provided a medium through which satisfactory DX communication could be enjoyed. G2MF, G2IG and G3AOO, the more regular stations to be heard, have been joined by several 3.7 Mc/s operators, resulting in some interesting round table QSOs between groups of DX stations. Most continents have been worked, the really consistent stations being VR2CG, VK3AEE, ZL2GL, ZL3IA, ZD4BF, KX6NB, ZS6OY, ZS3E, AP2CR and AP2BP (ex-G3ECH). All have been heard daily, with ZS6OY and AP2BP appearing between 17.00 and 18.00 looking for British stations.

Those unable to erect beams will be glad to hear that G3AOO and G3GKA use ground plane aerials and consistently receive reports similar or perhaps one R point down on those equipped with multi-element arrays. G2HO, a newcomer to 14 Mc/s, is using a pair of 807s and a three-element beam. DL6XM, G3GKR and G3GKE are reported active on 21 Mc/s.

Eighty Metres

Activity on this band continues to increase, 10 new stations having appeared recently. G3HUR (Macclesfield) has a W2UNJ-type phasing exciter feeding the aerial direct from the 6V6 balanced modulators. G3MY (Sheffield) has changed to a filter rig with a single section half lattice crystal network in place of the phasing rig previously used. G3HJK (Manchester) has been busy with a rebuild and has completed an all band (3.5 to 28 Mc/s) s.s.b. transmitter. G3CU (Wantage), back on

the air after some months' inactivity due to a change of QTH, has been testing a new chokeless power supply and is at present running an 829B linear amplifier (AB1) with 1000 volts on the anodes. Results are excellent.

G3HAE, G3ALD, G3GRO and G2JZ have phasing exciters while G3GEN and G2HMI run filters. G3ABJ (Sheffield) is enthusiastic about the advantages of s.s.b. and has a phasing exciter under construction to drive an 813 linear amplifier.

SM5AQW, OZ2BB, OZ4N and DL4YU are the latest newcomers on the Continent. Others preparing to use s.s.b. include G3COV, GD3IA and GD3ENK, while G6LX is understood to have acquired a Multiphase 10B exciter and should be active shortly.

Electronic Voice Control

Once the s.s.b. transmitter has been built it is not long before attention is turned to voice controlled operation. Unlike ordinary A3 double sideband transmission, there is virtually no carrier with s.s.b., and therefore no heterodyne. To break-in on s.s.b., the operator's voice is simply superimposed on the station already talking, producing little or no loss of intelligence to the listener. Other advantages become obvious after careful consideration of the relative merits of both systems. In the quiescent condition very little power is dissipated and it is a simple matter to apply bias to the various stages to completely cut them off when signals are not being radiated. Relays can be used, but by the application of electronics it is possible to obtain a completely noiseless and automatic change-over in which the receiver cannot become operative unless the transmitter is muted and vice versa. The action is positive without the unpleasantness of clanking relays.

The circuit shown in Fig. 1 has been developed by G3ESV and gives smooth break-in with loudspeaker operation. Connection to the receiver a.v.c. line should be made via a diode with the anode connected to the receiver and the cathode to the control unit. A.f. input to the v.o.c. unit should be about 2 volts and may be taken from the speech amplifier. Should the 0.1-2 Megohm time constant be too long it may of course be adjusted to the user's taste.

S.S.B. Conventionette

The annual conventionette of those interested in s.s.b. will be held during the Saturday afternoon of the R.S.G.B. Amateur Radio Exhibition, November 26. It is proposed that the gathering shall be run on similar lines to previous years except that the venue will be the Witley Court Restaurant, Woburn Place (opposite the Royal Hotel).

All those who intend to be present are asked to contact G2NH, 75 Woodlands Avenue, New Malden, Surrey.

Top Band on the R1155

By J. KENNEDY (G3IHD)*

QUITE a number of up and coming amateurs no doubt find the cost of a commercial communications receiver prohibitive. For them, the R1155, which is still available at a comparatively modest figure, is an excellent "buy". The only snag, of course, is that most of the models advertised do not cover Top Band, a gap occurring from 1.5 to 3 Mc/s. This prevents the learner from using the R1155 to receive the Slow Morse transmissions, which are of great assistance in the early stages of the development of the young enthusiast.

The object of this article is to describe a very simple conversion of the R1155 to Top Band, at the same time retaining the 80, 40 and 20 metre bands. The modification merely entails retuning the 600–1500 kc/s range.

It is worth mentioning at this point that it is unnecessary to replace the padding condenser for this range. All that is required is readjustment of the r.f. coil dust core (found on the can on top of the chassis at the corner of the three-gang tuning condenser); lessening the capacity by unscrewing this coil's associated trimmer marked "3" on the coilpack cover on the underside of the chassis, in the group of five holes made to take a box spanner, at the opposite end of the pack to that on which are mounted the bevelled gears; a retuning of the mixer and oscillator trimmers (both marked "3" in the centre and gear end groups of five respectively); and the readjustment of the dust-cores marked "3", found on the side of the coilpack as the set is viewed in its inverted position. After retuning, it was found that the 80 metre oscillator core (marked "2" and the second from the gear end of the coilpack) needed retuning slightly owing to its close proximity to the oscillator core marked "3" (which projects about $\frac{3}{16}$ in. through the aluminium cover over the coilpack) after the adjustment to Top Band had been made.

The writer was content to adjust the highest frequency on the altered range to 1960 kc/s, but if desired it is possible to tune up to 2 Mc/s. Of course, the higher the frequency aimed at on this range the worse will be the tracking of the mixer and the oscillator (the intermediate frequency is 560 kc/s). The h.f. end of the Top Band, however, is not outside the scope of a practical conversion, and the results are all that one would wish for in a comparable Top Band receiver. The lowest frequency on the converted range is slightly below 800 kc/s, so that one still retains quite a fair proportion of the medium wave band.

A signal generator, though desirable, is not absolutely necessary; if the process is gone through carefully a 100 kc/s oscillator and the broadcasting stations can be used as frequency checks. It was found convenient first to ensure that the slots in the appropriate cores in the coilpack were nearest the front panel of the receiver. Their adjustment was carried out with the aid of a piece of insulating material of suitable diameter which had been accurately filed exactly to fit the slots. It is worth mentioning also that the turning of the cores, which are surrounded by a white paste which holds them where they are set, should not be hurried, otherwise the slots are liable to be spoilt and subsequent adjustment made impossible.

The cover should remain screwed in position on the coilpack during the process; alignment will not be the same if the cover is replaced after adjustments have been made with it removed.

To indicate new frequency calibration points either remove the celluloid cover over the dial and gum an arc of paper of appropriate width on top of the altered range or gum the paper on to the celluloid itself to save taking off the cover. The latter is a rather difficult operation because the screws which hold the cover in position were dipped in fixing composition before they were originally inserted.

*11 Lanthwaite Road, Gateshead, 9.

National Field Day 1955 Results

N.F.D. Shield Winners		**Gravesend (G6BQ/P and G3EIW/P)**	**1186 pts.**
Runners-up		**Coventry (G5PP/P and G5SK/P)**	**1033 pts.**
Leading "A" station		**Gravesend (G6BQ/P)**	**670 pts.**
Leading "B" station		**Croydon (G6LX/P)**	**656 pts.**
Best 1.8 Mc/s		**Stourbridge (G8GF/P)**	**325 pts.**
Best 3.5 Mc/s		**Brentwood (G8PB/P)**	**439 pts.**
Best 7 Mc/s		**Gravesend (G3IEW/P)**	**309 pts.**
Best 14 Mc/s		**Weston-super-Mare (G5DV/P)**	**242 pts.**
"Scottish N.F.D. Trophy"		**Glasgow (GM8MJ/P and GM6MD/P)**	**735 pts.**
"Bristol Trophy"		**Slaithwaite (G8NF/P)**	**519 pts.**

Overseas station contributing most points to competing stations: DL2RO/P.

The Winners

The Gravesend team included G3HLF (T.R.), G3IJP, G3GGH, G6BQ, G3JLB, G3JVU, G6VC, G3JBT, G3ILA and G3IEW all seen in this picture with other willing helpers.

BY winning the 1955 National Field Day, held on June 4–5, with the all-time record score of 1186 points, the Gravesend R.S.G.B. Group has undoubtedly nailed one N.F.D. legend into its coffin. For long, up and down the country, it has been argued that the days were past when a fairly small group, with limited resources and man-power—and no particular geographic advantages—could hope to storm through the ranks of the now almost traditional top groups, with their powerful and experienced teams. And now, here is Gravesend, which until two years ago was able to put only one station into the field, winning by a comfortable margin; and, in so doing, sending a message of hope to all who have never yet won the coveted Shield. Appropriately enough, the honours on the operating side of this feat are neatly shared between old-timers (G6BQ and G6VC) on the low-frequency bands and the younger generation of amateurs (G3IEW and G3JLB) who knocked off some fine DX on 7 and 14 Mc/s. Just how good an effort their 1186 points represents is shown by the fact that it is only 129 points below the combined score of the four "best" individual band scores!

The niche of runner-up has come, by well-established precedent, to belong to Coventry. This year is no exception, and is indeed the third successive time that this Group has occupied this "bitter sweet" position. To gain the top award, Coventry needs to improve its 7 Mc/s score, and the increasing sunspot activity anticipated during the next few years should give them their chance; at the moment their central position in the U.K. is a handicap rather than a help on this band. At one stage, Coventry were working Americans on 14 Mc/s at a rate of almost one a minute.

There are indeed already significant signs that greater attention to 7 and 14 Mc/s will pay high dividends to groups who are prepared to brave the competition from fixed high power stations—amateur, broadcasting and commercial. DX activity on 14 Mc/s is shown in an accompanying table: on 7 Mc/s contacts from the British Isles included ZL, LU, VE, VO, W1, 2, 3, 4 and KP4. With the unlimited space available for aerials and the wide choice of sites, low power N.F.D. stations can turn in a log that would be a credit to a 150 watt home station.

Once again, Croydon has provided the best "B" station log, and congratulations are also in order for Stourbridge, Brentwood and Weston-super-Mare for "best on the band" entries. Gravesend produced the best "A" log, and also the best 7 Mc/s entry. Qualifying for the new "Bristol Trophy"—for the best single-station entry—is Slaithwaite with 519 points. Glasgow again carry off the Scottish N.F.D. Trophy, helped by an extremely good 7 Mc/s log. Seven groups —one less than in 1954—exceeded the 1000-point mark.

Psn.	Town or Area	1.8	3.5	7	14	"A"	"B"	Total
1	Gravesend	288	382	309	207	670*	516*	1186
2	Coventry	289	432	131	181	420†	613†	1033
3	Stourbridge	325	395	210	80	535†	475†	1010
4	Croydon	246	422	104	234	350†	656†	1006
5	Weston-super-Mare	270	313	180	242	450†	555†	1005
6	Derby	222	381	235	165	603*	400*	1003
	Hove District	289	404	167	143	456†	547†	1003
8	Cambridge	256	365	161	206	417†	571†	988
9	Brentwood	292	439	158	93	450†	532†	982
10	Cheltenham	300	328	194	157	494†	485†	979
11	Gloucester	196	338	178	209	534*	387*	921
12	Edgware & Hendon	270	374	122	151	392†	525†	917
13	Coulsdon & District	288	364	196	66	484†	430†	914
14	Slough	204	262	217	182	466*	399*	865
15	Pontefract	324	409	103	18	427†	427†	854
16	East Molesey	264	304	148	119	412†	423†	835
17	Wirral	246	292	114	157	360†	449†	809
18	Bristol	252	364	154	36	406†	400†	806
19	Ilford	321	328	129	22	450†	350†	800
20	Stockport	303	306	151	25	454†	331†	785
21	Hull	274	267	166	56	440†	323†	763
	Chelmsford	254	344	110	55	364†	399†	763
23	Peterborough	223	277	170	78	500*	248*	748
24	Norwood & District	211	258	176	91	469*	267*	736
25	Glasgow	199	146	301	89	345*	390*	735
26	Chingford	220	265	173	73	393†	338†	731
27	Southampton	261	292	141	34	553*	175*	728
28	Falkirk & Stirling	202	170	216	119	418†	289†	707
29	Grimsby & Cleethorpes	262	287	132	23	394†	310†	704
30	Edinburgh & Lothians	168	216	227	84	384*	311*	695
31	Medway	211	350	54	69	265†	419†	684
32	Scarborough	218	312	99	54	317†	366†	683
33	Sutton & Cheam	250	275	140	9	525*	149*	674
34	S. Birmingham	256	325	47	43	303†	368†	671
35	Nottingham	265	220	179	6	444†	226†	670
36	West Hartlepool	216	247	172	32	388†	279†	667
37	Sheffield	245	204	153	57	398†	261†	659
38	Luton	305	281	66	6	371†	287†	658
39	Exeter	193	223	220	21	416*	241*	657
40	Chester	206	240	127	77	446*	204*	650
41	Isle of Thanet	241	341	63	–	304†	341†	645
42	York	195	315	130	–	325†	315†	640
43	East Ham	276	225	131	2	501*	133*	634
44	Bath	249	218	97	50	346†	268†	614
45	Reigate & Redhill	203	138	214	55	341*	269*	610
	High Wycombe	277	333	–	–	277†	333†	610
	Blackpool	228	253	93	36	321†	289†	610
	Ealing	287	303	14	6	301†	309†	610
49	Aberdeen Town	120	230	161	93	350*	254*	604
50	Barnsley	210	235	112	46	322†	281†	603
51	Stroud	183	228	140	40	411*	180*	591
52	Shefford & Bedford	285	269	–	35	285†	304†	589
53	Norwich	171	291	59	67	230†	358†	588
54	Cannock & Lichfield	233	331	23	–	256†	331†	587
55	Bromley & Beckenham	239	229	91	4	468*	95*	563
56	Guildford & Woking	168	272	122	–	440*	122*	562
57	Kingston-on-Thames	204	245	93	15	449*	108*	557
58	Harlow	189	118	177	69	307*	246*	553
59	Guernsey	181	218	133	10	399*	143*	542
	Liverpool	148	196	160	38	344*	198*	542
61	Tunbridge Wells & Tonbridge	168	155	178	39	323*	217*	540
	Portsmouth	181	250	65	44	246†	294†	540
63	Slaithwaite	312	207	–	–	519*	–	519
64	Neath & Port Talbot	–	374	–	132	–	506†	506
65	Torquay	215	107	181	–	322*	181*	503
66	Boston	240	262	–	–	502*	–	502
67	Wrexham & District	156	204	133	–	289†	204†	493
68	Oxford	146	339	–	–	485*	–	485
69	Welwyn Garden City	236	144	64	12	380*	76*	456
	Danbury	206	250	–	–	456*	–	456
71	Brighton	185	161	66	25	251†	186†	437
72	Dorking & Leatherhead	202	207	26	–	228†	207†	435
73	E. Renfrewshire	116	96	218	3	212*	221*	433
74	Bletchley	198	227	–	–	425*	–	425
75	Mitcham	192	232	–	–	424*	–	424
76	Southport	198	96	80	44	294*	124*	418
77	Lowestoft & Beccles	125	182	95	–	220†	182†	402
78	Doncaster & District	183	214	–	–	397*	–	397
79	Retford & Worksop	123	116	134	23	239*	157*	396
80	Newcastle	104	143	15	127	247*	142*	389
81	West Cumberland	118	214	44	–	162†	214†	376
82	Acton, Brentford & Chiswick	278	–	92	–	370†	–	370
83	Romford	205	164	–	–	369*	–	369
	Lincoln	227	–	142	–	369†	–	369
85	Preston	189	97	–	74	286*	74*	360
86	Enfield & District	209	150	–	–	359*	–	359
87	Solihull & District	264	94	–	–	358*	–	358
88	Southend-on-Sea	246	110	–	–	356*	–	356
89	Walsall	242	112	–	–	354*	–	354
90	Leicester	174	171	–	–	345*	–	345
91	Gt. Yarmouth	117	187	33	–	304*	33*	337
92	Rotherham	–	261	–	75	–	336†	336
93	Hounslow	197	131	–	–	328*	–	328
94	Newark	111	214	–	–	325*	–	325
95	Dorchester	122	173	–	–	295*	–	295
96	Bury	–	–	157	134	–	291*	291
97	Jersey	129	–	141	–	270†	–	270
98	Maidstone	201	–	57	–	258†	–	258
99	Belfast	105	144	–	–	249*	–	249
100	Bexley & Bexleyheath	160	69	–	–	229*	–	229
101	Ballymena	–	225	–	–	–	225†	225
102	Ardrossan Area	22	70	66	39	92*	105*	197
103	Elgin/Fochabers	102	81	–	–	183*	–	183
104	Dundee	26	156	–	–	182*	–	182
105	Bradford	99	4	–	–	103*	–	103
	Entry invalid—No Declaration							
—	South Shields	172	169	273	18	341*	291*	632
	Late Entries							
—	Lewisham	140	244	7	40	147†	284†	431
—	N. Cornwall	8	91	–	–	98*	–	98

* "Old" frequency groupings. † "New" frequency groupings.

UP . . . UP . . . UP . . .

1947	Southgate	583
1948	Edgware and Hendon	774
1949	East Molesey	914
1950	Cheltenham	847
1951	Falkirk	931
1952	Bristol	1123
1953	Bristol	1054
1954	Bristol	1091
1955	Gravesend	1186

Not this year!

Although Bristol could not pull it off a fourth time, they managed to keep smiling despite mishaps. Standing (left to right) G3GYQ, G5UH, G3ECS, G3IZM, G2FYT (T.R.), G6RB, G2IK, G3IFV, G3RQ, G3SB, B.R.S.9864, G3ERQ; seated, G3CHW, G3IMP, Mr. Gibbs, G6GN, G3CTN (C.R.) and B.R.S.12716.

(Photo by G3CHW)

Station Equipment

The gear in use at the leading stations was as follows: *Gravesend "A"*: Transmitter, 6L6 e.c.o.—6L6 multiplier —6L6 p.a. Receiver, 11-valve home-built superhet with BC453 "Q-5er". Aerial, bent 260ft centre-fed Zepp.

Best on the Bands

1.8 Mc/s		3.5 Mc/s	
Stourbridge	325	Brentwood	439
Pontefract	324	Coventry	432
Ilford	321	Croydon	422
Slaithwaite	312	Pontefract	409
Luton	305	Hove	404
Stockport	303	Stourbridge	395
Brentwood	292	Gravesend	382
Coventry	289	Derby	381
Hove	289	Neath	374
Gravesend	288	Edgware	374
Coulsdon	288		
7 Mc/s		**14 Mc/s**	
Gravesend	309	Weston-s-Mare	242
Glasgow	301	Croydon	234
S. Shields	273*	Gloucester	209
Derby	235	Gravesend	207
Edinburgh	227	Cambridge	206
Exeter	220	Slough	182
E. Renfrewshire	218	Coventry	181
Slough	217	Derby	165
Falkirk	216	Cheltenham	157
Reigate	214	Wirral	157

*Entry invalid

"A" Station Honour Roll

1.8 and 3.5 Mc/s Grouping

Gravesend (G6BQ/P)	670
Derby (G4CO/P)	603
Southampton (G5LR/P)	553
Gloucester (G3MA/P)	534
Sutton and Cheam (G6KM/P)	525
Slaithwaite (G8NF/P)	519
Boston (G6GH/P)	502
East Ham (G2ZZ/P)	501
Peterborough (G2NJ/P)	500

1.8 and 7 Mc/s Grouping

Stourbridge (G8GF/P)	535
Cheltenham (G2AJ/P)	494
Coulsdon and District (G2DN/P)	484
Hove (G3CUY/P)	456
Stockport (G3FYE/P)	454
Brentwood (G3LA/P)	450
Ilford (G2QI/P)	450
Weston-super-Mare (G5TN/P)	450
Nottingham (G3JKO/P)	444
Pontefract (G6MF/P)	427

Power source, 230 V 60 c/s, petrol/electric set. Operators, G6BQ, '6VC.

Gravesend "B": Transmitter: EF91 e.c.o.—EF91 buffer—6AG7 buffer—6V6 (optional) doubler—6V6 doubler—807 p.a. Receiver: HRO. Aerials: 7 Mc/s dipole, 30ft high and 14 Mc/s vertical dipole. Power source: 230 V 60 c/s p.e. set. Operators: G3IEW, '3JLB.

Coventry "A": Transmitter: EF50—EF50—6V6—807. Receiver: AR88 plus "Q-5er". Aerials: 800ft long-wire and half-wave dipole. Power source: p/e generator. Operators: G2FTK, '3IWF, '3KEF, '5PP, '5SK, '6TD.

Coventry "B": Transmitter: 6J6—EL91—EL91—miniature 807. Receiver: BC342N plus double "Q-5er"; on 14 Mc/s a crystal-controlled converter preceded the BC342N. Aerials: 276ft long wire, and two section W8JK 14 Mc/s beam. Power source: p/e generator. Operators: G2DAG, '3ABA, '3HLI, '3KEF, '4NB.

Croydon "B": Transmitter: v.f.o (EF80)—multiplier (EF42)—p.a. (half of 815 with other section as neutralizing condenser). Receiver: AR88D. Aerials: 3 x 138ft end-fed, spaced at 120° intervals. Power sources: rotary converter for transmitter, vibrator for receiver. Operators: G3BFP, '4QK, '6LX.

The banning from N.F.D. of all commercially-built receivers is a topic which is always good for a lively debate—and for a steady trickle of resolutions submitted to the Contests Committee. It is therefore all the more interesting to note that a home-built receiver helped the Gravesend "A" station to lead the field. The protagonists of home-construction may thus reflect with satisfaction that the merits of a design for the job will

Essentials for any N.F.D. are a sylvan setting (like this one just outside Welwyn Garden City), plenty of food (coming up on that trolley), and a squad of youngsters to help at present Field Days and operate at future ones! The "harmonics" shown (left to right) belong to G3JMS, G8DR, G3JMS (the three little boys), B.R.S.1105 (the next two) and, again, G8DR. Behind the camera are G2CN/P and G5UM/P.

eventually win through without artificial stimulants in the form of restrictive rules. Incidentally, Ealing "A" station put up quite a respectable score using dry batteries only, in an effort to eliminate the bugbear of accumulators; the receiver was an 0-V-1! Few groups took advantage of the changed rule that permitted the use of separate transmitters for each band.

The majority of groups are now using the "new" frequency groupings (1.8 with 7 Mc/s, etc.) but nevertheless so far the winner has always come from amongst those who have remained faithful to the old division of duties. This year there was a noticeable tendency to reduce the number of operators at each station, usually more from tactics than any shortage of hands. Though signs of apathy are reported from some districts—the

total number of entries shows a slight decline—this seems to reflect more on the general level of amateur activity in the U.K. at the moment than on N.F.D. in particular. It has also been suggested that the date tends to be too close to Whitsun, and this year unfortunately coincided with local holidays in some North Country areas.

On the Air

DL2RO/P, who—also for the third consecutive time—was the overseas station contributing most points to entrants, made some 155 contacts; the input was 8 watts to a WS62 transmitter feeding a 267ft long wire aerial averaging only 16ft high. The station was operated under strictly portable conditions 10 miles north-west of Hamburg. This is probably the last N.F.D. in which the call DL2RO will be heard, as Major Drudge-Coates is due to return to the U.K.

Gravesend made more than 420 contacts; 112 in 8 hours on 1.8 Mc/s, including about 90 portables; some 150 contacts (105 portables) on 3.5 Mc/s; some 100 contacts on 7 Mc/s (50 portables, about half of them overseas); and about 60 contacts on 14 Mc/s, including 4 Commonwealth portables. The operators divided up their time approximately as follows: "A", 2000—0315 and 1615—1700 on 1.8 Mc/s, remainder on 3.5 Mc/s. "B", 1700—2100, 0900—0945, 1230—1315, 1600—1700 on 14 Mc/s, remainder on 7 Mc/s.

"B" Station Honour Roll

3.5 and 14 Mc/s Grouping

Croydon (G6LX/P)	656
Coventry (G5SK/P)	613
Cambridge (G5DQ/P)	571
Weston-super-Mare (G5DV/P)	555
Hove (G3FXB/P)	547
Brentwood (G8PB/P)	532
Edgware and Hendon (G2IM/P)	525
Neath (GW2AVV/P)	506
Cheltenham (G5BM/P)	485
Stourbridge (G3BMY/P)	475

7 and 14 Mc/s Grouping

Gravesend (G3EIW/P)	516
Derby (G2DLJ/P)	400
Slough (G6CJ/P)	399
Glasgow (GM6MD/P)	390
Gloucester (G2RT/P)	387
Edinburgh and Lothians (GM3UM/P)	311
Bury (G2GA/P)	291

Some of those who helped to man the Derby A station. From left to right, D. Wright, G3JIY, G3JNV, F. Clay Jnr., G3GGK, G3IBL, G3JWQ, G3FGY, G2CVV (T.R.), G3JFD, G2OU and G8BN.

European portables, notably those in HB1, DL, ON4, MB and EI, put in a spate of welcome activity. Empire twelve-pointers included ZB1FF, ZC4GF, ZC4NFD, VP9D, VP9BO, VP9CE and VS1GL. At VS1GL/P the input was 36 watts to a groundplane aerial; more British stations would have been worked had not trouble developed in the aerial change-over switch. The operators included VS1GO, 1GV, 1GS and ex-G3HJF. French stations signing /QRP were not—as some groups claimed—portables but were taking part in an R.E.F. low power contest arranged to coincide with N.F.D.

Grimsby and Cleethorpes group would like to know the height above sea level of all stations; their own is 0ft being actually on the sea shore. Well, the highest was almost certainly MB9CC/P—3768ft up in the Austrian Alps.

G2QY and G3IFB took the opportunity to test mobile-type equipment in order to compare a low long-wire with short whip aerials—the loaded 7–8ft whip generally proved superior.

G5BM operating the Cheltenham B station.
(Photo by G2FWA)

Off the Air

It would be instructive if one could compile a complete list of the troubles to which Field Day stations are prone. Top of the poll would almost certainly be that controversial piece of equipment, the petrol-electric generator. Groups that are unable to lay hands on one of these fickle machines often express the opinion that they give a great advantage to those that can, but in practice they all too often prove to be an Achilles heel. Bristol—the group that gained the award in 1952, '53 and '54—were doubly unlucky in experiencing major breakdowns in the generators at both their "A" and "B" stations. The Medway and Maidstone groups also had trouble of a similar nature. Other trials and tribulations reported this year include: heavy static

Operators in Cyprus included (left to right, standing) ZC4RX, W2NDS, ZC4BA and G2HIL; (front row) ZC4JA and ZC4XA.

charges on long-wire aerials—at York an extra heavy discharge burnt out a p.v.c. flex feeder; a cracked iron-dust core that put a v.f.o. "off frequency"; cows who positively seemed to relish the taste of insulation (Nottingham); a faulty aerial change-over relay that remained undetected for many hours (Southampton); Pontefract gremlins (category unspecified); loss of operators due to rail strike (Mitcham); loss of ball-bearings in chief operator's motor-cycle (Danbury); broken aerial, run-down accumulators, missing acid, a dipole, plus feeder, rolled up in 1954 mysteriously becoming a feeder only in 1955, the breaking of the only mantle for the Tilley lamp (all this batch from Ealing).

Notes and Comments

Some confusion was evidenced in the logging of times; to bring the rules into line with G.P.O. station log requirements it was stated that times should be given in G.M.T., but unfortunately the log sheets, which are normally printed in batches sufficient to last several years, bore the letters B.S.T. In the circumstances, both systems have been accepted, so that the only losers were the Contests Committee who were considerably handicapped in the checking of logs. Luckily, the supply of logs is now exhausted so the matter should straighten itself out next year.

The perennial comments were made on power, petrol generators, output valves, and home-built receivers. The pros and cons of these suggestions are carefully weighed each year when formulating the rules. Scottish stations still feel that the extra point should be restored for G-GM contacts, even if only on the lower frequencies:

N.F.D. DX on 14 Mc/s.

B.S.T.	Stations worked by N.F.D. Portables
18.00	W2, 3, 8, 9, CO, 4S7, VS1, ST, ZD6.
19.00	W1, 2, 3, 8, 0, 4S7, ST.
20.00	W1, 2, 4, 5, 6, 8, VE3, 5, 6, 7, VS6, VQ4, CR6, ST.
21.00	W1, 2, 3, 5, 6, 7, 8, 9, 0, VE2, 3, VO, ZD2, 3, KV4, VQ4, ST.
22.00	W1, 2, 3, 4, 8, VE3, KV4.
23.00	W1, 2, 4, 8, 9.
00.00	W1, 2, 3, 4, 8, VE3.
01.00	W1, 2, 3, 4.
02.00	W4, 5, KP4, VP9.
03.00	CO, VK3.
04.00	W6, ZL.
05.00	W6.
06.00	W6, 7.
07.00	W4, 6, TI, ST.
08.00	W6.
09.00	W3, 8, ZD2.
10.00	ZD2.
11.00	W1, VP9, KV4.
12.00	W1, 2, 3, 4.
13.00	W2, VP9.
14.00	W2.
15.00	KA2.
16.00	W2, 4, 6.
17.00	W1, 2, 3, 6, 8, 9, VE4, VS6, ZE3.

GC also presses its claims. Luton would like to see 144 Mc/s as an optional alternative to 14 Mc/s.

A few operating practices come under fire from several groups. There are still those operators who do not wait for the final "R" of acknowledgment, and later refuse to make a second contact, claiming that the station has been worked before. When requested, a second contact should always be established, details of both entered in the log, but points claimed for one only. In checking, the Contest Committee finds indisputable evidence that stations often believe themselves to be in contact with someone who is, in fact, working an entirely different station; this fault arises mainly from the incorrect use of "BK" to replace call-signs. Some groups still lose heavily in the checking, the result of careless logging. On the other hand, many groups have learned from experience to pay great attention to this point, and submit model logs.

Before writing *finis* to the 1955 report, the Contests Committee, on behalf of all R.S.G.B. members, would like to express its appreciation to all those who work so hard to make N.F.D. such an outstandingly successful event: to the T.R.s, organizers, and fillers-in of log-sheets; to those who build, loan, furnish or test the equipment, the accumulators and the tents; to those who obtain or give permission for the use of sites; to all those overseas stations whose activity adds so much to the interest; and not least to those who may never touch a Morse key but who assist in a myriad other ways, not forgetting, of course, the long-suffering XYLs who tolerate this annual madness on the part of the O.M.s.

Check Logs

The following are thanked for useful check logs:
G2BP, 2GZ, 2QY/P, 2XG, 3BPM, 3BWQ/P, 3DDM/P, 3HSM, 3IFB/P, 3KEA, 4BC, 4LX/P, 8ML/P, 8TL/P; GM2FHH/P, 3GIF/P, 3HTL/P, 4GX/P; GW3YR, 3GCZ, 8PG/P; DL2RO/P, MB9BJ/P, MB9CC/P, OZ2NU, ST2NG, ZB1FF/P, ZC4GF/P, ZL2ARL.

Newcastle Luncheon Club

THE first meeting of the Newcastle Luncheon Club was held at the Crown Hotel, Clayton Street, on September 2, under the chairmanship of Capt. E. Clarke (G8AO). The second meeting was due to take place on October 7. Those wishing to attend future meetings are invited to contact G3ATA, G3ELP or G3JMT.

THE MONTH ON THE AIR

By S. A. HERBERT (G3ATU)*

THE past weeks have been quite encouraging from a DX man's point of view, with mounting activity on all bands except ten metres, which remains obstinately closed to all except purely local paths for most of the time. Fifteen seems to be coming more into its own and on occasion has been open for DX from early morning until late at night, although it is still by no means overpopulated! Twenty suddenly saw the morning re-appearance of VKs in quantity, together with an occasional ZL—very welcome after their long absence from the band. On good days the fun has been fast and furious as stations from all parts of the world came in in their turn, but it is still difficult to work—or even to hear—some of them through the still-present European babel. Forty is becoming interesting in the early mornings, when ZLs are actually far more in evidence than they are on the higher frequency bands. Eighty, too, is starting to open on the path to ZL. Altogether, autumn and winter prospects seem quite encouraging.

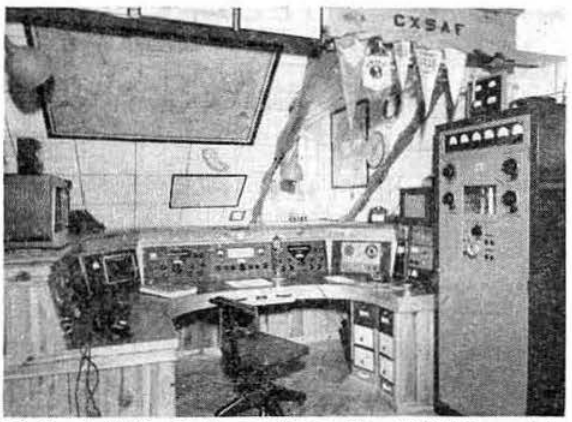
Afghanistan: at last !

The big news this month must be the arrival on twenty c.w. of a genuine, honest-to-goodness YA. The call to look for is YA1AM and present activity seems centred around 14085 kc/s. His letter to G2MI reveals that he has held two previous DX calls of which one —operative from 1952 to 1955—was particularly well-known. The present set-up must remain strictly under cover, so all QSL cards other than U.S. must go through the R.S.G.B. QSL Bureau. U.S. amateurs should send their cards via the A.R.R.L. Cards from amateurs in other countries will be dealt with by G2MI. Now at least we can all forget about the unprincipled antics of YA3UU and can stop worrying about the doutbful status of YA6GAL. Get hold of '1AM and you've got a good 'un!

Twenty Metres

The improvement in band conditions took place too late to be reflected in this month's reports, for the most part, and many people have found things dull. However, **G3AAE** (Barnet) chatted on c.w. with the not too common CR9AI, ZD6RM and XW8AB. John mentions the Kermadec Is. (see a later note) and hears that ZL1AHC is on from there and can be found on 14 c.w. "I don't know who found him," says John. "I can't!" **G3KBH** (Gravesend) battled with hordes of stations of little DX-appeal who kept settling on the stations he was working, tuning up and then giving forth with lengthy CQs. He wishes they would do a little listening first. ET3AH, OQ5RU, VQ2SP, FY7YE (QSL via W4ML), VE7ZK (22.30), a ZS6 and an FA were added to his score, but CR6, VQ5, VQ6LQ, 9S4AB, CE5AW, OQ0CZ, KL7, CR7 and a 5A4 wouldn't answer. **G3KBN** (Stockport), using his 17 watt c.o/p.a., worked VK3, VK5, OA4ED and new ones PY, FF8, ZS, VU2 and XW8AB; he heard an OH working XV2LD. **G2DH** (Manchester) contacted VE7GI, ZE6JP, ZD6, CR6, ZD3BFC, VK4SE, SU1DD, K6DCE (after 22.00), plus PY and LU. **G3ISV** (Middlesbrough) uses 120 watts to a dipole and says his DX is not as exotic as some, but with XW8AB, VE5AJ, KV4AA, VE7ZK and YV4AX accounted for, he's doing all right. A QSL from VK3KX for a 1953 QSO shows one should keep hoping! **G3CUC** (Windermere) reports a 'phone QSO with YU2DB while G2CNT was operating that station during a visit to Yugoslavia.

B.R.S.20106 (Petts Wood) has sifted the layers to good effect and unearthed on c.w. some ZLs, FL8AD (22.25), HH2FL, KH6s ER and AYG, FB8BR, FB8BF, ZS8L, CR9AI, ZD9AC (17.10), FK8AC, CE7XJ, VE5HR and the indefatigable gentleman signing as ZA2A. Norman then tried his domestic receiver and picked up VQ6LQ, LU4ZH and VP8BD (20.00), no less! 'Phone produced KH6s OH, OR, BX, AJD, IU, KL7, VE8PF, KR6QX, VS6CL, FM7WF, ZL and VK, including VKs 6DX, 7AZ and 7CK. Once more the domestic set was switched on and YS1MS and VK2AUR were heard! **B.R.S.20416** (London, S.E.12) logged the 'phone of KG1AA, KL7NFC, VP1EE, VP2KM, VP9BP, VE6, 7, 8, AP2U, TGs 9MB and 9AD, KC6CG, FC9UC (Corsica) and HL1CB (who, on 14179 kc/s at 22.48 G.M.T., must, unfortunately, be suspect). **B.R.S.20487** (N. Finchley) reports 'phones KH6OR, 6BX, KL7, VQ5FS, ZL2BE, KG5MB (probably KZ5. That "zee" can be very misleading), VP6 and VKs 2, 3, 5, 6 and 7. **B.R.S.20317** (Bromley) lists c.w. CX2AM, CE3, CR9AI (14015 at 15.00), KC6CG (19.40), HK1TH, KL7s (around 21.00), KV4BK, PK6RM (worked by an OK!), VE6VK, 7GI.



This fine installation is the operating position at CX5AF, owned by James Miller of Montevideo, Uruguay. The equipment includes Collins 75A3 and 75A4 receivers, a Panadaptor and an Ampex tape recorder. The transmitter comprises a Collins 32V–2 (situated between the two receivers) as an exciter driving two 4–250As modulated by 304TLs. One kilowatt input is used on all bands from 3.5 to 28 Mc/s although most operating at the moment is on 21 Mc/s. Three element wide-spaced rotary beams for 14, 21 and 28 Mc/s, 75ft high, help to make CX5AF's signal really potent. Mr. Miller was a recent visitor to R.S.G.B. Headquarters.

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

8AW, VP4BN, VU2JG, ZD2FNX, 2WAF. His best on 'phone were KR6QX, MP4KAB, KP4s KD, QA and ZS6OY (s.s.b.). A friend heard a UA1 and a UA3 working EA9. **B.R.S.20135** (Newport, I.o.W.) enjoyed the morning openings when he logged ZL2BE, ZL4JA, VK2, 3, 4KS, 5MS, 7AZ, 7CK, 7RX, M1B, W9MOC/KL7, TF2WAF, LB7PE, HB1KU/HE, ET2US, 4X4 and OD5. On 'phone, **R. J. R. Crocker** (Plymouth) gives pride of place to XV2LD, working a GM. Speaking perfect English, he gave his power as 650 watts to a rhombic and asked for QSLs via Box 6666, Bombay, 20. Other DX from R.J.R. includes CM9AA, AP2U, VS2BN, VU2GM, AP2BP (s.s.b.), KC6CG (16.25), TA3US, ZD4BF (s.s.b.), KG1FR, F9WT (Corsica) and an impressive list of VK/ZL, including ZL4FO, using s.s.b.

G3ATU was lucky enough to work YA1AM (17.12) and is relieved to find he is not "one of those"! Nothing else of note was worked, apart from ZC5CT, who conveniently appeared on c.w. (14.30), but some interesting "material" was heard in the gaps between the European raw a.c. specialists. FK8AR/MM was weak and intriguing at 13.30 but couldn't be raised. ZD9AC is often to be heard, 17.00-18.00, but is usually busy with traffic to ZS1. FQ8AX (QRI, QRH) address is Box 218, Brazzaville. FB8BR is available around 14050 from 17.00 onwards, but eventually retires to the band edge for a nightly D.U.F. round-table. ZS3AP is on and XZ2OM is sometimes heard from 15.00 onwards. HB1KU/HE had 1,000 QSLs printed. He made only 700 QSOs, so there should be cards for all! FK8AB was a good signal one day, working a GI. All was going well until on to the FK's frequency appeared an I1 calling a determined "CQ DX." By this time, several hopefuls were calling the FK8 and our I1 friend decided to join in. This he did and was promptly called by another I1. The pair chatted happily for some time, bade each other a fond farewell, and the first I1—still on the same frequency—called "CQ DX no Eu." Ah well! Early this month, FB8CK became active on c.w. He *could* be on Comoro.

Fifteen Metres

Some Pacific DX is starting to creep through on good days and **G3AAE** was delighted with QSOs on the key with KC6CG and KG6NAB, JA, VS6 and CR7AD. AP2L, VS6CL, VS6CW and ZS3E were good ones on 'phone. At **G2DH,** QSOs were made with HZ1HZ, EA9AP, MP4BBE, 4X4FS, CR6AI, FA, ZC4, LU and VQ4. Choice ones heard by **B.R.S.20106**—on c.w.—were ET3AH, ZD6RM, KG6NAB, JA, DU6IV, FM7WD and W7s FB, UDG, LPM and MQY and—on 'phone—VR2CG, VK9BS, CR9AH, VS6, MP4BBL, FB8RG (Madagascar), VP2GG, 4S7MG, VP2GG, W6, 7, 0 and HH7RM/M (Box 146, Port-au-Prince). On 'phone, **B.R.S.20135** mentions VK9DB (Papua), VS1BO, 1AY, 1FK, VS2CU, 2BD, VP8AQ (South Shetlands), ZS9G, FQ8AG, VQ2RH, VQ3ES, CE3QK and maritime mobiles W3OZA (South China Sea) and W4DGW (11°.00″N-26°00″W, on s.s.b.). **R. J. R. Crocker** combed the 'phone band thoroughly and, amongst other DX, picked up K4BST/AM talking to W5JVL/AM, HC1EP, KZ5MB, ZS3E, VO6I, CO1AF, TI2BX, CP5EK, HK3GO, EL3A, PJ2AO, ZD4BQ, VP9L, KP4, KV4, VP6 and CE6AB.

Ten Metres

A certain amount of DX has popped up occasionally to enliven the band. **G2FQR** (Walsall), for example, worked ZS1JD (18.10), OQ5RU (18.45) and heard ZS6RA and a PY, while **B.R.S.20135** logged 'phones CX5CV, LU1EK, 1QG, 6AB and 7QB, PY4EM and ZS1ZK. **G3IEE** heard many North American stations on October 3 between 18.00 and 21.00 at strengths up to S9. There were varying degrees of fading on all signals.

Forty Metres

Forty is livening up again and the DX is there for those prepared to do things the hard way. **G2ASY** (London, S.W.12) dealt with some good DX in spite of the usual appalling QRM. Using 30 watts to a modified T.1154 and a 70ft windom, he got good reports from W1, 2, 8, VE1 and ZL3 but, he says, "7 Mc/s is *not* a boy's band!" **B.R.S.20106** found no less than ten ZLs, VK2GW, VK7LZ, EA9AP and PY7HN, with PY7ADR on 'phone. Norman is the only one to mention eighty

Frequency Predictions for October, 1955

PREPARED BY J. DOUGLAS KAY (G3AAE)

BAND	NORTH AMERICA	CENTRAL AMERICA	SOUTH AMERICA	SOUTH AFRICA	NEAR EAST	MIDDLE EAST	FAR EAST	AUSTRALIA
28 Mc/s	1530	1300—1430	1400—1800	0800—1800	0800—1500	0800—0900	0800—0900	0900
21 Mc/s	1300—2000	1100—2030	0900—2030	0700—1900	0630—1800	0700—1530	0700—1600	0700—1400
14 Mc/s	1030—2300	1000—2230	0800—2130	0600—2100	0600—2030	0600—1800	0600—1830	0730—1700
7 Mc/s	2200—0800	0000—0700	0000—0700	2200—0400	1930—0500	2000—0200	2000—0200	1500—2100
3.5 Mc/s	0600	0500	0600	0400	0000—0400	0130	0200	1700

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

metres, on which band he pulled in ZL3GQ, W9EGQ, KP4KD and SU1RS.

Top Band

GM3KLA (Lerwick) is ex-B.R.S.20606 and lives on the island of Unst, in the Shetlands—the farthest North point in the British Isles. As the island has no main electricity, Bill is doing his best with batteries, a wind-charger and a 250 volt vibrator pack. He runs a c.o./6V6 p.a. on 1881.5 kc/s and hopes to operate on Mondays and Fridays around 22.00-23.00.

Overseas News

Ron Perks, **G4CP** (Dudley), passes on the news that W6OXS will shortly reduce power from 1 kilowatt to 10 watts. He hopes to make DXCC with that power and will concentrate on 21 Mc/s, where he hopes to meet many old friends. Cards for his recent expedition to HH0 and VP2 are being printed by W4LVV and will go via the Bureau. Ron himself worked KJ6FAB and a QSL from him would mean the whole K—6 series confirmed! After a spell as ZC4JA, John Hunt is once more active under his old call, G2FSR. **ZC4JA** is now cancelled and stations still needing a QSL should contact John at his home address. **MP4BBV** is now back in the U.K. and missing cards are assured by writing to C. J. Pye, 1 Park Street, Hereford. '4BBV hopes to return to Bahrain in two years—meantime activity will continue, as his relief will take out a call, possibly MP4BBX or BBY, and Ian Cable, B.E.R.S.900 will be active, probably as MP4BBW. G2FQT is now **ZC4PW** and hopes to be on 14, 21 and 28 Mc/s, mainly using 'phone. Travellers passing through the airport are welcome to ring him at H.Q. M.E.A.F. (Main). They should ask for Major Wolfendale. **ST2GB** is also home at G3IUU and QSLs missing from ST2GB or ST2AM (also closed down) should go to '3IUU via the Bureau. STs 2NG, 2AC and 2DB are all thanked for helping to get ST2AM on the air.

B.E.R.S.195 sends another of his comprehensive accounts of current Oceanic activity. Firstly, the complete tally of VK1s is 1DC, 1HH and 1ZM on Macquarie and 1EM, 1JW, 1RA, 1VH and 1AWI at Mawson, Antarctica, who will be replaced late in '55 or early '56. VK1HI, mentioned in the July BULLETIN, is non-existent and is probably a mistake for OK1HI. VK9RH was heard at weekends, around 21.00-22.00 G.M.T., working VR2AP and JA on 'phone and c.w. VR2BZ has left the R.N.Z.A.F. but is still active from Fiji. ZK1AB hopes to return soon after his illness in N.Z. Eric often hears KH6OR working KP6AK on A3 (02.00 G.M.T.), but he can't hear the KP6. KS6AB is back in Pago-pago, but inactive at present, with a 1 kW rig lying idle! Eric remarks that Gs on *any* band have been a rarity, but here for the record is the DX he has heard. On 3.5 c.w., VK9AU. On 7 c.w., KR6LJ, FK8AC, VK9RC, 9WK, 9RH, 9OQ, DU7SV, KM6AX, XE2OK, and on 'phone, HP3FL and VK9RH. On 14 'phone, VK1ZM, VK9OK, 9DB, 9BW, 9RH, ZM6AT, and on c.w., FK8AQ (04.00), KJ6FAB, VK1DC, YJ1DL (S9 at 07.00!), VR2CS and LU9XA. Roll on the sunspot maximum! With his 100,000th log entry postwar passed, Eric's score is 232/225 countries; he awaits confirmations from MP4BAU, CE0AD and F9QV/FC.

Crisp items from **W6YY**:EA9DF still has plans for Ifni this winter if he can find a suitable portable rig. FW8AB (Wallis Is.) got going after W6MUR sent him a transformer. Kermadec Is. has no amateurs since ZL1AHC who operated only on 40 and 80 c.w., left some six months ago (so you can take it easy '3AAE!), but ZL1PA and ZL2GX plan to go there in mid-January if a boat can be found for the 1,400-mile round trip. PZ1CD has been on 14020 kc/s. W6 has had long path openings to Europe on 14 Mc/s around 14.00/15,00 G.M.T.—the first for over two years. Pete (VS4CT and VS5CT) is active from ZC5CT, with an outstanding 'phone signal. Some W6s have worked FB8XX (Kerguelen) on 14101 kc/s A1. VR6AC continues with his 20 watts on Tuesday and Saturday, 03.30-04.30 G.M.T.

The Kermadec Islands

The A.R.R.L. announces the addition of the islands, lying some 600 miles n.n.e. of New Zealand, to their postwar Countries List. DXCC credit will be given starting November 1, 1955, for confirmations dated on or after November 15, 1945.

The Maldive Islands

Early in September, twenty was thrown into something of a tizzy by the appearance on c.w. and 'phone of one **XV2LD,** claiming to be operating from the Maldives.

* * *

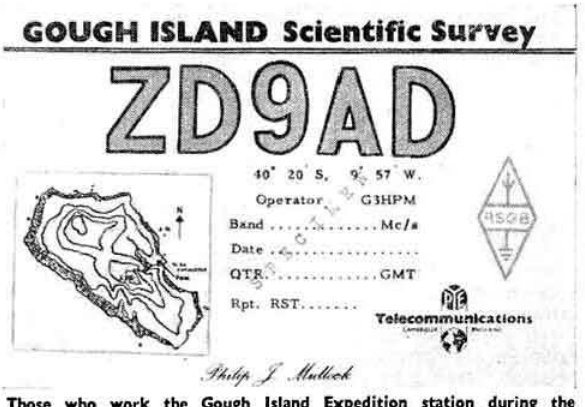
And so until next month, cheers and good hunting. Please post your comments to arrive by October 20, if possible. 73.

The European Band Plan

ALL U.K. licence holders are urged to comply with the European Frequency Band Plan. By so doing amateur communication will be made more effective. The plan, which has been adopted by all I.A.R.U. Member Societies in Europe, is as follows:—

Frequency Band	Use
3500 – 3600 kc/s	Telegraphy only
3600 – 3800 kc/s	Telephony only
7000 – 7050 kc/s	Telegraphy only
7050 – 7300 kc/s*	Telegraphy and Telephony
14000 – 14125 kc/s	Telegraphy only
14125 – 14350 kc/s	Telegraphy and Telephony
21000 – 21150 kc/s	Telegraphy only
21150 – 21450 kc/s	Telegraphy and Telephony
28000 – 28200 kc/s	Telegraphy only
28200 – 30000 kc/s†	Telegraphy and Telephony

**To become 7050—7150 kc/s later.* *†To become 28200—28700 kc/s later.*



Those who work the Gough Island Expedition station during the next few months will receive one of these distinctive cards through the R.S.G.B. QSL Bureau. ZD9AD is expected to commence operation in the middle of October. All bands from 1.8 to 28 Mc/s will be used, with the emphasis on 21 Mc/s 'phone and c.w.

Radio Amateur Emergency Network

By C. L. FENTON (G3ABB)*

THE first R.A.E.N. Rally is behind us, and the Committee now have the task of scrutinising the logs and analysing criticisms. Listening on the bands, it was gratifying to note the number of participating stations, but it was disappointing to hear the number of operators who obviously had not bothered to read and assimilate the rules, yet were keen enough to enter into the spirit of the Rally. During the early stages, a number of entrants were heard repeating the same test phrases over and over again to each station they worked; although the rules were clear enough, they did not realise their mistake until it was pointed out to them over the air. These operators must have lost a considerable number of points in the early stages of the Rally. Another obvious criticism is of the number of non-official test phrases in use; here again, although the rules definitely stated that all test phrases would be issued by the Hon. Secretary, a number of participants neglected to apply for official phrases, but saw fit to invent and use their own. Both these points, plus individual criticisms, will be considered in due course. In the meantime the Committee thank all who participated in this, the first R.A.E.N. Rally. Thanks are also due to non-members who submitted check logs.

A considerable number of suggestions for future Rallies have been received and these are much appreciated. However, the volume is such that it will not be possible to individually acknowledge them, but the senders can be sure that the suggestions will all be carefully considered and analysed.

Some members are still awaiting an allocation of lifeboat equipments. These will be cleared as soon as further supplies are received from the shipping companies.

News From the Groups

South London group continues to hold regular exercises on alternate Sundays. It is proposed to hold these exercises every Sunday afternoon during the coming winter. *Co. Antrim, N. Ireland,* operated GI3BHX as a fixed station during the Rally. They comment on the extremely good operation procedure employed by most participants, but complain of two stations (non-R.A.E.N.) heard during a lull in the Rally, who were criticising R.A.E.N., and painting a most "unwanted" picture. The group suggests that those stations should at least refrain from expressing their views over the air, as such expressions of opinion can do so much harm. *Whitstable.* Five members maintained a continuous listening watch. Amongst other suggestions, they propose that future rallies be restricted to 3.6-3.8 Mc/s band only, and over a shorter period of time. They also say that operators in the recent Rally spoke too fast, and departed from the standard phonetic system.

Wirral hoped to have a number of stations participating in the Rally, but would like to see a similar event for c.w. operators. *Staffordshire* also expected to participate very actively in the Rally; they continue to run regular practice nets, with the control station rotating round the members. *Leicester* have recently held their own emergency exercise with mobile, portable and fixed stations participating, and will be holding a further exercise on October 16.

Southport. The Southport Radio Society have obtained a new Club Room—without mains. This is giving the local R.A.E.N. members an opportunity to try out gear suitable for our specialist requirement. *Poole.* G3IUG is keeping the flag flying, and is prepared for operation under any emergency conditions. A replica of the R.A.E.N. badge is displayed on the front of his bungalow for the guidance of visitors, official and otherwise. *Norfolk.* Activity is increasing slowly, and it is hoped that this increase will continue during the coming months. G3JYG/P, G3DRL/P, and G3HRK/P co-operated in a recent exercise.

It is known that Yorkshire and Lincolnshire had strong contingents out for the Rally, but no reports are yet available.

E.C.O.s' Reports

The Committee are still disturbed at the lack of news from many E.C.O.s. without which this column cannot be written. E.C.O.s are again requested to submit regular reports to the Hon. Secretary.

Membership

In order to give a balanced coverage over the whole of the U.K. a considerable increase in membership is required in Wales, Scotland and the Isle of Man. Ordinary members are needed in all areas, and E.C.O.s are required in certain places. Volunteer now, and be ready and prepared for the coming winter.

Hon. Secretary's Schedules

For the past few weeks the Hon. Secretary has been available on 3700 kc/s (approximately) at 2200 G.M.T. each Friday and Saturday evening. As the number of R.A.E.N. stations calling G3ABB has been negligible the schedule will be discontinued as from the publication of this column. G3ABB will continue to operate regularly on 3700 kc/s, and also on 1980 kc/s, to no fixed schedules, and will always be pleased to contact R.A.E.N. stations.

The writer, who will be motoring to Sleaford, Lincs, on Friday afternoon, November 4, and returning on Sunday, November 6, will be pleased to make a short pause en route to meet members and to discuss R.A.E.N. if requested to do so.

Appointments and Resignations

The following are appointed Acting E.C.O.:—

T. Darn (G3FGY), 42 Laurel Avenue, Ripley, Derbyshire.

J. V. Beamand (G3DZT), 101 Valley Lane, Wissage, Lichfield.

R. Mayman (G2ABR), 27 Tennyson Avenue, Hull, Yorks.

* * *

R. Burwell (G4LH) has resigned as E.C.O. for Hull.

Correction

The correct address of Mr. B. Hayes (G3JBU) is 7 Western Terrace, Northampton, and not as published in the August issue of the BULLETIN.

* * *

Reports for inclusion in the next R.A.E.N. feature, which will appear in the December issue of the BULLETIN, should reach the writer not later than November 20, 1955. Please rally round with reports which may be telephoned if necessary.

*Hon. Secretary, R.A.E.N. Committee, "Niarbyl," Gay Bowers, Danbury, Chelmsford, Essex (Danbury 518).

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 Tuesday, August 16, 1955, at 6 p.m.

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

Apologies for Absence

Apologies for absence were submitted on behalf of Messrs. W. H. Allen, L. Cooper, and H. W. Mitchell.

* * *

Membership

(a) *Resolved* (i) to elect 56 Corporate Members and 7 Associates; (ii) to grant Corporate Membership to 5 Associates who had applied for transfer; (iii) to waive for a period of 12 months the subscription of Messrs. H. L. Clark (G3DWA), R. S. Brown (G3GMQ), N. E. Jones (G3JVI) and G. McCracken (G3GST) on the ground that they suffer from blindness.

(b) The Secretary reported that of the 646 members whose subscription became due on May 1, 1955, 137 became overdue on July 31, 1955. Of this number 25 were London, 93 were Country and 16 were Overseas Corporate members and 3 were Associates. Of those overdue 16 London, 54 Country and 15 Overseas members held call-signs.

The Secretary submitted details of the 19 members (including 3 Associates) who had written to resign during the five weeks ended August 13, 1955. Of this number 1 had resigned on financial grounds, 7 gave no reason, 9 stated they had lost interest and the other 3 gave various reasons.

I.A.R.U. Conference, Italy, 1956.

Resolved that the Society's delegation to the I.A.R.U. Conference in Italy during 1956 shall consist of two R.S.G.B. representatives in addition to the R.S.G.B. members of the International Committee.

It was agreed to name the two delegates after the International Committee has met in Amsterdam during October, 1955.

Election of Council

Nominations were made in accordance with the list published in the September issue of the BULLETIN.

R.S.G.B. News Bulletin Service

Arrangements were approved for bringing into operation the R.S.G.B. News Bulletin Service. (Details of the arrangements were set out in the September issue of the BULLETIN.—Ed.)

Organised Lectures

The Secretary was instructed to advise the Society's Regional Representatives that the Council is prepared to offer a first-class lecture for a guaranteed attendance of R.S.G.B. members at, initially, six centres.

Reports of Committees

R.A.E.N.

Resolved to receive, and adopt as a Report, the Minutes of a Meeting of the Radio Amateur Emergency Network Committee held on July 2, 1955, and to accept Recommendation A contained therein.

The Recommendation dealt with the provision of clerical assistance for the Hon. Secretary to the Committee.

Membership and Representation

Resolved to receive, and adopt as a Report, the Minutes of a Meeting of the Membership and Representation Committee held on July 12, 1955, and to accept Recommendations A and B contained therein.

The Recommendations dealt with nominations for the office of Regional Representative.

A Recommendation that the Society should agree to pay the expenses of all T.R.s in the Region concerned who attend a Regional Meeting, was referred back to the Committee.

R.S.G.B. News Bulletin Service

GB2RS	**3600 kc/s**
Sundays	**11.00 G.M.T.**

Exhibition (Home Constructors' Section)

Resolved to receive, and adopt as Reports, the Minutes of Meetings of the Exhibition (Home Constructors' Section) Committee held on July 13, 1955, and August 5, 1955, and to accept the Recommendation set out in the Minutes of the first mentioned meeting.

The Recommendation dealt with expenses to be claimed by certain members undertaking stand duty at the National Radio Show.

Technical

Resolved to receive, and adopt as a Report, the Minutes of a Meeting of the Technical Committee held on July 20, 1955, and to accept Recommendations A and B contained therein.

The Recommendations dealt with the award of the Norman Keith Adams Prize and Bevan Swift Memorial Prize for 1955.

The meeting terminated at 9 p.m.

Headquarters' Station

IN the Résumé of the Minutes of the Proceedings of the Council Meeting held on July 12 and published on page 130 of the September BULLETIN, the letter "s" was inadvertently inserted after the figure £26. The nett figure realized was £26 4s. 7d.

London Lecture Meeting

Friday, November 11, 1955

"THE G4ZU THREE BAND MINIBEAM"

by

G. A. BIRD (G4ZU)

(Radio Section, Post Office London Telecommunications Region)

at the

Institution of Electrical Engineers
Savoy Place, Victoria Embankment

Buffet Tea 5.30 p.m. **Lecture 6.30 p.m.**

The lecture is given by kind permission of the Regional Director, G.P.O. London Telecommunications Region.

Society News

Congratulations . . Congratulations . . Congratulations . .

First Reports and Comments on GB2RS

RESPONSE to the first transmission from GB2RS on September 25 inaugurating the R.S.G.B. News Bulletin Service was immediate and enthusiastic. Excellent reception was reported from Land's End to John O'Groats, from the South Coast, Wales and Northern Ireland. By letters, QSL cards and even tape recording, members told of how well they had received the historic broadcast. In addition they made many comments of which the following are a selection taken at random.

"Very good transmission indeed here 6 miles south of John O'Groats"—GM3JDR. "Very well done. Keep it up"—B.R.S.20284 (Prestatyn). "Congratulations on another successful effort on behalf of British amateurs"—GI3HAJ. "This news service is a real step forward—hope to tune in every Sunday"—G3ETQ. "Congratulations and best wishes"—Miss K. H. Grace. "FB c.w. Looking forward to future bulletins"—G3KFW. "Congratulations to all concerned in transmission and preparation"—G5MR. "Why 11 o'clock? Some of us go to church you know!"—G3HAT. "It's what we've wanted for a long time"—G3HIF. "Some QRM from the 'natter-band' stations"—GW3INO. "Look forward to when GB2RS/T will operate!"—G3JNB. "Contents of bulletin nicely balanced and varied"—B.R.S.20807. "Congratulations to all who had a hand in organizing this great step forward"—G3DJD. "Welcome to the new arrival"—G3GJX. "Congratulations to all concerned in achieving one of our long standing ambitions"—B.R.S.15304. "Newsreader was excellent and had proper informal style to put it over"—G3JBU. "Good Luck to our station"—G2HMK. ". . . feel that these transmissions will be invaluable in binding the Society into one large family"—G3FRT. "You should have heard 'em (calling you) from this end—worse than rare DX!"—G2NS. "Best of luck to our new station GB2RS"—B.R.S.19066. "Good luck in this new venture and my thanks to G6MB for the trouble he is taking"—G3GGJ. "A very FB transmission"—B.R.S.20243. "Valuable addition to ham radio"—G3KJL. "Heartiest congratulations"—G6BY.

News items intended for use in the News Bulletin Service should reach Headquarters by second post Wednesday if possible or first post Thursday at the latest for transmission the following Sunday. Members' co-operation in supplying up-to-the-minute information for use in preparing the bulletin will be much appreciated.

Council Ballot

NOTICE is hereby given that at the Ordinary Meeting of the Society to be held at the Institution of Electrical Engineers on November 11, 1955, the members present will be asked to choose two or more scrutineers for the purposes of the Council Ballot. The Ballot will be scrutinized during the afternoon of Friday, December 9, 1955.

R.S.G.B. Amateur Radio Exhibition

THE Ninth Annual Amateur Radio Exhibition will be opened officially at 12 noon on Wednesday, November 23, 1955, by Vice-Admiral J. W. S. Dorling, C.B., M.I.E.E., Director of the Radio Industry Council.

The Exhibition is to be held at the Royal Hotel, Woburn Place, London, W.C.1, from Wednesday, November 23 to Saturday, November 26, and will be open daily from 11 a.m. to 9 p.m. There will be an admission charge of 1/-.

In connection with the Exhibition the General Secretary will be pleased to hear from any member who is willing to volunteer for duty on the Headquarters' stand. Volunteers should state the date (or dates) and times they will be available.

Wortley-Talbot Trophy

THE Council is pleased to announce that the Wortley-Talbot Trophy has been awarded for the current year to Mr. Harry Wilson, P.C. (EI2W), of Foxrock, Co. Dublin, in recognition of his outstanding work on 144 and 420 Mc/s. In making the award the Council were mindful of the part played by Mr. Wilson in connection with the International V.H.F. Society.

R.S.G.B. Film Library

MEMBERS are reminded that the R.S.G.B. Film Library is again open and that the following films are available:—

1947	D/F event (200ft)
1947	N.F.D. (400ft)
1951	N.F.D. (650ft)
1951	London Convention (800ft)
1954	Bristol Convention (800ft)

Members who wish to borrow any, or all, of these films should write in the first place to Mr. L. S. Gilham, 2 Parkstone Avenue, Hornchurch, Essex, giving the following details:—

(1). Film (or films) required.
(2). Date of showing.
(3). Type and number of projector.
(4). Details of projectionist's experience.

The films should be returned by registered post immediately after use to the Film Curator and not to R.S.G.B. Headquarters. Films should be rewound on their *original* spools. Films returned on old spools which are bent or twisted will be rewound anew and the member concerned charged for the cost of the spool. The R.S.G.B. films are also available for display by affiliated societies.

Mobile Rally Great Success

ENTHUSIASM was the keynote of the first Mobile Rally held at Binsey, near Oxford, on October 9, 1955, and attended by more than 75 members and friends. For several hours mobile operators demonstrated their equipment and discussed the finer points of this absorbing new development in British Amateur Radio. Of particular interest were W3WAM's home-built "Viking Mobile" transmitter, G6AG's 2 m transmitter-receiver and G3WW's remotely controlled motor tuned New Zealand ZC1 carried in the boot of his car. A very impressive demonstration of the effectiveness of the "twin noise squelcher" was given by W3WAM.

Thanks are due to E. B. Grist (G3GJX) and other members of Oxford and District Radio Society for the organization of this very successful and enjoyable event. A fuller report will appear in *Mobile Column* next month for which reports are invited.

GB2RS

THE Council records its thanks to Mr. Eric Martin (G6MN) who has donated to the Society a supply of special GB2RS QSL cards. The cards will be used to confirm reception of the R.S.G.B. News Bulletin Service.

Slow Morse Transmissions

THE only alterations to the schedule of Slow Morse Practice Transmissions published in the September issue of the BULLETIN are as follows:—G2FRX of Plymouth has ceased his transmissions at 19.15 on Thursdays. G3GEN of Gloucester now commences at 18.30 on Fridays. Members should note that all times quoted are now G.M.T.

Volunteers are urgently required to augment the service during the winter months when so many newcomers are learning Morse. If *you* can spare 15 minutes a week or more for this very worthwhile work please write without delay to C. H. L. Edwards (G8TL), 28 Morgan Crescent, Theydon Bois, Essex, stating the time or times you can operate and your frequency.

Bulletin Wrappers

ANY member whose address is not clearly readable on the wrapper in which he receives his copy of the BULLETIN should inform Headquarters so that a new stencil may be prepared. Whilst every care is taken in the printing of wrappers, it is not possible to examine each stencil individually to ensure that it is in good condition.

Amateur Radio on Band III

HOW to build a crystal set was the theme of the first broadcast in the new Associated-Rediffusion Television "Tea-V Time" series *Hobby Corner* on September 26 from the London I.T.A. station. In addition to constructional details, a brief description was given of the operation of crystal diodes and transistors. An otherwise excellent introduction to radio as a hobby was somewhat marred by a rather hurried presentation of the circuit which allowed very little time for the diagram to be copied down by the uninitiated.

An Introduction to Amateur Transmitting

Continued from page 159

Handbook, Fourth Edition, Langford-Smith, Iliffe & Sons, Ltd.

Recent R.S.G.B. BULLETIN articles of interest include:

(1) "Some Pitfalls in Speech Clipping", Hammans, December, 1951.
(2) "An Effective Speech Amplifier Clipper Filter Unit for the Elizabethan", Varney, June, 1955.
(3) "807s in Zero Bias Class B", Crisp, October, 1954 (see also p. 250, November, 1954). (An interesting speech amplifier for a 150 watt transmitter.)

Amateur Radio at Bournville Flower Show

BOURNVILLE Radio Society and the South Birmingham R.S.G.B. Group staged an impressive display of Amateur Radio equipment which attracted much favourable comment at the Bournville Allotment Association's Annual Flower and Vegetable Show held recently. Stations were in operation on Top Band (G3JAO/A), 3.5 Mc/s (G2DOF/A) and 144 Mc/s (G2ATK/A). The Society's own station, G6BV, was equipped for operation on 14 Mc/s but conditions were not favourable for long distance contacts.

The stand was laid out in the form of two Ls forming a hollow rectangle so that members of the public could walk right behind the operators. Equipment exhibited included a signal generator, test meter, 144 Mc/s mobile transmitter, a crystal set, Top Band portable receiver, valves, a variable voltage power pack, grid dip oscillator, v.h.f. receiver, model control transmitter and a Morse practice oscillator. A tape recorder proved very popular with the public.

The 144 Mc/s station used G2ATK's mobile transmitter-receiver running at 5 watts input and a rotary beam 120ft above the street level. G2DOF had a modified TCS6 transmitter for Top Band, 3.5 and 7 Mc/s feeding a Windom aerial. A BC342N receiver was used by G2DOF and G6BV, the transmitter for the latter comprising 6AC7 e.c.o., 6AQ5 buffer/doubler, 6L6 doubler and 813 final. G3JAO used his own Top Band transmitter and a BC342 receiver, with a 132ft long wire of which only 25ft was the top—the rest was lead-in!

In addition to the interest created amongst members of the public, the stand proved a meeting place for many local amateurs. It is hoped that it will prove to be the forerunner of similar annual events.

Will YOUR equipment be there ?

MANY members are known to possess well-constructed equipment likely to prove of great interest to visitors to the Society's Amateur Radio Exhibition at the Royal Hotel, London, at the end of November. Offers to loan such equipment are therefore invited and should be sent immediately to E. Yeomanson (G3IIR), 9 Trewsbury Road, Sydenham, London, S.E.26.

The Amateur Radio stand at the Bournville Allotment Association's Annual Flower Show. From left to right, B.R.S.19342 and G2ATK who manned the 2m equipment, G2DOF at the 40/80 m rig, G3JAO and two B.R.S. members who operated the Top Band station.

Tests and Contests

D/F National Final

ONLY two competitors—T. C. Reynolds of B.T.H., Rugby, and H. Drury of Romford, first and second respectively—succeeded in finding both stations in the D/F National Final held in Hampshire on September 11.

In any D/F event there is considerable scope for ingenuity, and success depends largely on how well the organizers and competitors pit their wits against one another. Without doubt the Contests Committee planned their part well for this year's Final. First they chose as the contest area the beautiful country around St. Mary Bourne near Whitchurch in Hampshire, a district unknown to the competitors. As an added ingredient, they used what the entrants no doubt considered diabolical cunning in the location of the A station but made the B station reasonably easy to find.

At the starting point near Faccombe, the B station was heard well; one competitor reported hearing the A station but in fact the first transmission from this station did not commence until 13.35 due to difficulties in moving the vehicle used to its final location.

At the start all competitors moved off to find the B station about 14 road miles away where the transmitter was conventionally hidden amongst dense bushes. K. Finch of High Wycombe did well to find it in 50 minutes closely followed by A. C. A. Newman in 57½ minutes.

Nine of the ten starters found the B station within 2½ hours but only two of them (the winner and runner-up), unable to hear the A station, returned to the starting point where they found the signal was excellent. This was not really surprising. Just before the start a small MG sports car with a couple in it had drawn up and parked beneath the trees at the road side. The visible occupants proceeded to enjoy a picnic lunch, thus providing an excellent cloak for G6HD/P, perched somewhat precariously on the differential behind the seats and covered with the assorted clobber that is carried in a car—mackintoshes, tools, maps, travelling rugs, thermos flasks etc. From this cunning hide-out the A station signals went out with unfailing regularity until T. C. Reynolds finally overcame his natural reluctance to interrupt a "courting couple" and challenged the unseen operator. Fourteen minutes later H. Drury did likewise.

As may be seen from the tabulated results, the winner and runner-up reached the finishing point in 2 hours 30 minutes and 2 hours 34 minutes after the start—very creditable performances indeed.

Results — D/F National Final, 1955

Posn.	Name	A Station	B Station	Finish	Total Time
1	T. C. Reynolds (*Rugby*)	1535	1434	1600	2 hrs. 30 mins.
2	H. Drury (*Romford*)	1549	1459½	1604	2 hrs. 34 mins.
	K. Finch (*High Wycombe*)		1420		
	A. C. A. Newman (*Salisbury*)		1427½		
	R. K. Seabrook (*Southend*)		1500		
	R. D. Charlton (*Twickenham*)		1505		
	J. J. Grant (*Rugby*)		1510		
	P. N. Prior (*Rugby*)		1527		
	G. T. Peck (*High Wycombe*)		1545		

Competitors and their parties enjoyed an excellent tea at the Bear Hotel, Hungerford, at the conclusion of the contest.

The operators of the hidden stations were: A—Lyell Herdman (G6HD); B—Doug Findlay (G3BZG), Stan Fryer (G3ERO) and Tony Timme (G3CWW/P). The starter and umpire was W. H. Mathews (G2CD), Chairman of the Contests Committee.

International DX Contest

LOGS for the International DX Contest, details of which were published on page 114 of the September issue, should be sent to *CQ Magazine*, 67 West 44th Street, New York 36. They must be postmarked not later than December 15, 1955. The name of the contest has been changed to the World Wide DX Contest.

Mobile Operation

THE Post Office states that one log book may be used for both home station and mobile operation, provided the entries clearly show which refer to /M operation.

November London Meeting

MEMBERS are asked to note that the Society's meeting at the Institution of Electrical Engineers in November will be held on the 11th of the month and not at the end of the month as usual.

Trade Winds

IN the *Trade Winds* feature in the September issue, the name of the company manufacturing printed circuits for the Osram 912 amplifier was incorrectly stated. It is of course the Telegraph Condenser Co., Ltd.

Proops Bros. Ltd.

IT is regretted that in the advertisement for Proops Bros. Ltd. which appeared on page 139 of the September issue of the BULLETIN, the word "Shop" was not printed after the phrase "The Walk Around," due to an accident which occurred after the BULLETIN went to press.

Waterford Radio Club operated three portables during N.F.D. at a site 460ft a.s.l. near Dunmore East, County Waterford. EI4S, EI5V and EI2Q are here seen operating the 14 Mc/s station, EI3R/P.

Regional & Club News

Bristol.—More than 400 members and visitors attended the September meeting in the Physics Lecture Theatre of Bristol University at which P. S. Carnt, B.Sc.(Eng.), A.M.I.E.E., of the General Electric Co. Ltd., lectured on "Colour Television." H. J. Gratton (G6GN) will give a talk on aerial systems for the DX operator on October 21. Members who have not yet received a copy of the rules for the Bristol C.W. Contest on October 23 should write at once to the C.R., T.R. or *Hon. Secretary:* D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, Bristol 7.

Brighton & District Radio Club.—At the A.G.M. last month the following officers were elected: *Chairman:* T. J. Huggett; *Vice-Chairman:* C. Fairchild; *Hon. Treasurer:* R. Sowerby; *Hon. Secretary:* F. W. How, Top Flat, 67 Marine Avenue, Hove, Sussex; *Committee Member:* Mr. Hemsley.

Grafton Radio Society.—At the A.G.M. in September the following officers were elected:—*President:* J. H. Clarke (G2AAN); *Vice-Presidents:* B. Randell (GW3ALE), W. H. Jennings (G2AHB), L. A. Kippin (G8PL), P. Beresford (G3AFC), J. A. Reading (G3RX), C. T. Bird; *Chairman:* L. A. Kippin (G8PL); *Vice-Chairman:* P. Beresford (G3AFC); *Hon. Secretary and Treasurer:* A. W. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park; *Committee Members:* H. Mulcahy (G3JVV), E. Adams, S. Legg.

Lothians Radio Society.—At the meeting at 25 Charlotte Square, Edinburgh, on October 20 commencing at 7.30 p.m., there will be a recorded lecture on "TVI Proofing" by R. L. Varney (G5RV). On October 29 members will be visiting the B.B.C. station at Westerglen. A. C. Grainger (GM3BQO) will describe a Beginner's Transmitter on November 3, while on the 17th, J. W. Kyle, B.E.M. (GM6WL) will give a talk on "A 70 cm DX-pedition to Drummore." *Hon. Secretary:* John Good (GM3EWL), 24 Mansionhouse, Edinburgh 9.

Newark Amateur Radio Society.—Four teams have entered for the Society's D/F contest. Meetings are held on the first Sunday in each month at Northgate House, commencing at 7 p.m. Recent visitors have included G3IQM (C.R. for Nottingham) and G3JKO. *Hon. Secretary:* J. R. Clayton, 160 Wolsey Road, Newark.

Nottingham & District Amateur Radio Society.—At the September meeting N. D. Littlewood gave a talk on the Wearite Tape Deck and Amplifier. "Hints on Mobile Operation" by C. H. L. Edwards (G8TL) is the title of the recorded lecture on October 21. Members will be visiting the Newark Radio Society later in the year for a quiz and social evening.

QRP Society.—The contest for the Kaleveld Cup will take place during the period November 5 to 12. All bands from 1.8 to 144 Mc/s will be used. Stations taking part will sign/QRP after their calls. *Hon. Secretary:* John Whitehead, 92 Rydens Avenue, Walton-on-Thames, Surrey.

Ravensbourne Amateur Radio Club.—Visitors are always welcome at club meetings in the Science Room, Downham Men's Institute, Durham Hill School, Downham, on Wednesdays at 8 p.m. The club station is active on 3.5, 7 and 14 Mc/s using the call-sign G3HEV. Courses in preparation for the R.A.E. and the Morse Test are in progress. *Hon. Secretary:* J. H. F. Wilshaw, 4 Station Road, Bromley, Kent.

Shefford & District Amateur Radio Society.—Meetings at Digswell House are arranged for 8 p.m. on October 21 ("Radio Mathematics," L. Graver), October 28 (Film Strip Lecture), November 4 (Lecture and Demonstration) and November 11 (Film Show). Further details may be obtained from the *Hon. Secretary:* G. R. Cobb (G3IXG), 7 Hitchin Road, Shefford, Beds.

Slade Radio Society.—"Receiving Systems for F.M." is the title of the talk to be given by J. G. Harris of E.M.I. Ltd., on October 28 at Church House, High Street, Erdington. The Annual Dinner will be held on November 5. A technical representative of the Dunlop Rubber Co. Ltd., will give a talk on "Some Applications of Electronics in Industry" on November 11. The Society's call-sign is G3JBN.

South Manchester Radio Club.—Most of the members who took the R.A.E. course last winter are now licensed. Those wishing to join the present course should apply immediately to the *Hon. Secretary:* M. Barnsley (G3HZM), 17 Score Street, Bradford, Manchester 11. F. Cooknell (G3IPN) will give a talk on "Getting on 420 Mc/s" on November 4. Meetings are held at Ladybarn House, Mauldeth Road, Fallowfield, Manchester 14.

Stourbridge & District Amateur Radio Society.—At the meeting on September 6, F. Bills (G3CLG) lectured on the "Design and Construction of High Frequency Radio Valves." *Hon. Secretary:* A. K. Davies, 48 Church Avenue, Amblecote, near Stourbridge.

Swindon Amateur Radio Club.—As a result of a very successful first meeting, the club will in future meet every month. R. Reynolds (G3IDW) has been elected *Chairman* and G. R. Pearce (G3AYL/ZL1AKL), 102 Kingshill Road, Swindon, *Hon. Secretary.* Weekly classes of instruction for R.A.E. have been arranged.

Tops C.W. Club.—The Third Annual Midlands Topsfest was held at the Swan Inn, Lichfield, on August 27, and was attended by well over 50 radio amateurs. Talks were given by G3BA, G3ABG (Contests Manager), G3FZW and G3ELZ. G3FZW/A and G3DZT/A operated from the meeting. The Top Band contest for the "Rednal Trophy" will take place on October 29. The club was founded in 1946 in an effort to bring together all amateurs keen on "pounding the brass." There are today 305 members in 21 countries. *QMF* is the bi-monthly newsletter. *Hon. Secretary:* J. P. Evans (GW8WJ), 2 Ffordd Ty Newydd, Meliden, Flintshire.

Torbay Amateur Radio Society.—At the meeting on October 15, the second in the series of recorded lectures loaned by the R.S.G.B. entitled "The Engineer and Society" by Capt. P. P. Eckersley, A.M.I.E.E., will be given. The first, at the September meeting, was much appreciated.

Region 5 and 12 Representation

FOR business reasons Mr. B. McK. Davidson (GM3ALZ) of Aberdeen has withdrawn his name as the Council's nominee for the office of Region 12 Representative for the two year period beginning January 1, 1956.

Also for business reasons Mr. C. H. Babbs (G5BK) of Cambridge has resigned from the office of Region 5 Representative.

Nominations for their successors should be made in the form prescribed on page 132 of the September, 1955, issue of the BULLETIN.

Representation

THE following are amendments to the list of Town Representatives published in the December, 1953, issue:—

Region 4—Leicestershire

Leicester

W. A. Mead (G5YY), 82 Edward Avenue, Braunstone.

Northamptonshire

Northampton

S. F. Berridge (G3ITW), 20 Ethel Street.

LONDON MEETINGS

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

October 28, 1955: "AMATEUR RADIO IN THE ANTARCTIC—a review of VK Activity 1947–1955." By **Roth Jones** (VK3BG). (The paper will be read by Arthur O. Milne, G2MI and will be illustrated by films and slides.)

November 11, 1955: "THE G4ZU THREE BAND MINIBEAM" by **G. A. Bird** (G4ZU).

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

January 27, 1956: **Presidential Address.**

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

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

Affiliated Societies

The following Clubs and Societies were affiliated to the Radio Society of Great Britain as at September 20, 1955.

*ACTON, BRENTFORD & CHISWICK RADIO CLUB, c/o Mr. R. G. Hindes, 51 Rusthall Avenue, Bedford Park, London, W.4.
ADMIRALTY ELECTRONICS SOCIETY (G3BPU), c/o Mr. W. J. Green, 82 Bloomfield Avenue, Bath, Som.
*AIRCRAFT APPRENTICES RADIO CLUB (G3IDZ), c/o No. 1 Radio School, R.A.F. Locking, Somerset.
AMATEUR RADIO CLUB OF NOTTINGHAM (G3EKW), c/o Mr. N. D. Littlewood, 129 Standhill Road, Nottingham.
*AMATEUR RADIO CLUB (MB9BJ), c/o 2/Lt. R. Walker, R. Signals, 12 Wireless Squadron, British Troops in Austria, B.T.A. 3.
AMATEUR RADIO CLUB (G5PM), c/o S/Cdt. Dolan, Waterloo Coy, R.M.A. Sandhurst, Camberley, Surrey.
*AMATEUR RADIO SOCIETY OF TRINIDAD & TOBAGO, c/o 3 Coryat Street, Curepe, Trinidad, B. W. Indies.
AMATEUR RADIO SOCIETY, No. 32 M.U. St. Athan (GW3CKB), c/o J/T Gwinnell, R.A.F., St. Athan, West Camp, Barry, Glam.
AQUILA AMATEUR RADIO CLUB (G3BRK), c/o Mr. R. C. B. Cutts, Section L21, "Aquila" I.E.M.E. (M. of S), Golf Road, nr. Chislehurst Station, Bromley, Kent.
ARIEL RADIO GROUP (B.B.C. CLUB) (G3GDT & G3AYC), c/o Mr. B. A. Toms, 38 Ashbourne Avenue, South Woodford, London, E.18.
*ARMY APPRENTICES' SCHOOL AMATEUR RADIO CLUB (G3HOS), c/o Officer I/C Telecommunications Wing, Army Apprentices' School, Arborfield, Berks.
BABCOCK & WILCOX STAFF ASSOCIATION RADIO SOCIETY (G3GKM), c/o Mr. J. O. Marshall, Babcock & Wilcox Ltd., Babcock House, Farringdon Street, London, E.C.4.
BARNSLEY AND DISTRICT AMATEUR RADIO CLUB, c/o Mr. P. Carbutt, 33 Woodstock Road, Barnsley, Yorks.
*BENSON AMATEUR RADIO CLUB (G3JTE), c/o Master Navigator R. Pontet, Royal Air Force, Benson, Oxon.
BLACKPOOL & FYLDE AMATEUR RADIO SOCIETY, c/o Mr. H. G. Newland, 161 Penrose Avenue, Blackpool, Lancs.
BOURNVILLE RADIO SOCIETY (G6BV), c/o Mr. W. V. Shepard, Council Offices, Cadbury Bros. Ltd., Bournville, Birmingham 30, Warwicks.
BRADFORD RADIO SOCIETY, c/o Mr. F. J. Davies, 39 Pullan Avenue, Eccleshill, Bradford, Yorks.
*BRENTWOOD & DISTRICT AMATEUR RADIO SOCIETY, c/o Mr. R. E. Hunter, 49 Crescent Road, Brentwood, Essex.
BRIGHTON & DISTRICT RADIO CLUB, c/o Mr. T. J. Huggett, 15 Waverley Crescent, Brighton 6, Sussex.
*BRITANNIA RADIO CLUB, St. Vincent House, Royal Naval College, Dartmouth, Devon.
B.T.H. RECREATION CLUB, RADIO & TELEVISION SECTION (G3BXF), c/o Mr. D. C. Wright, c/o B.T.H. Recreation Club Office, The British Thomson-Houston Co., Ltd., Rugby, Warwicks.
CAMBRIDGE & DISTRICT AMATEUR RADIO CLUB, c/o Mr. F. A. E. Porter, 38 Montague Road, Cambridge.
*CAMBRIDGE UNIVERSITY WIRELESS SOCIETY (G6UW), c/o Mr. C. H. Lindsey, University Mathematical Laboratory, Free School Lane, Cambridge.
CATTERICK AMATEUR RADIO CLUB (G3CIO), c/o Mr. D. J. Hall, 2 Sqdn., 1 Training Regt., Royal Signals, Catterick Camp, Yorks.
CHESTER & DISTRICT AMATEUR RADIO SOCIETY (G3GIZ), c/o Mr. A. Norman Richardson, 23 St. Mary's Road, Dodleston, nr. Chester.
*CHELTENHAM AMATEUR RADIO SOCIETY (G3GPW), c/o Mr. E. A. J. Miles, 8 Elmfield Road, Cheltenham, Glos.
CITY OF BELFAST Y.M.C.A. RADIO CLUB (GI6YM), c/o Mr. H. J. Campbell, 36 Lisburn Avenue, Belfast, N. Ireland.
CITY AND GUILDS COLLEGE RADIO SOCIETY (G5YC), c/o Mr. R. H. Gewitzke, City and Guilds College, Exhibition Road, South Kensington, London, S.W.7.
COMPTON BASSETT AMATEUR RADIO CLUB (G3HXZ), c/o Mr. B. Heath, Sgts' Mess, R.A.F. Compton Bassett, Calne, Wilts.
*CO-OP RADIO SOCIETY & S.W. LISTENERS CLASS (GI3IBC), c/o Husband Memorial Hall, Frederick Street, Belfast, N. Ireland.
COURTAULDS AMATEUR RADIO GROUP (G3CQD), c/o Mr. W. P. Stevens, Courtaulds Ltd., Foleshill Road, Coventry, Warwicks.
COVENTRY AMATEUR RADIO SOCIETY (G2ASF), c/o Mr. J. H. Whitby, 24 Thornby Avenue, Kenilworth, Warwicks.
DERBY & DISTRICT AMATEUR RADIO SOCIETY (incorporating DERBY WIRELESS CLUB, 1911) (G3ERD), c/o Mr. F. C. Ward, 5 Uplands Avenue, Littleover, Derby.
DORKING & DISTRICT RADIO SOCIETY (G3CZU), c/o Mr. J. Greenwell, 7 Sondes Place Drive, Dorking, Surrey.
EDGWARE & DISTRICT RADIO SOCIETY (G3ASR), c/o Mr. E. W. Taylor, 99 Portland Crescent, Stanmore, Middx.
*EDINBURGH AMATEUR RADIO SOCIETY, c/o Mr. D. Black, 16 Edina Place, Edinburgh 7, Scotland.
GARATS HAY RADIO CLUB (G3CHR), c/o Capt. J. Howe, 10 W.T.S., R. Signals, Woodhouse, Loughborough, Leics.
GRAFTON RADIO SOCIETY (G3AFT), c/o Mr. A. W. H. Wennell, 145 Uxendon Hill, Wembley Park, Middlesex.
GRAVESEND AMATEUR RADIO SOCIETY (G3GRS), c/o Mr. R. E. Appleton, 23 Laurel Avenue, Gravesend, Kent.
GREAT PORTLAND RADIO CLUB (G3GJD), c/o Mr. V. F. Turner, A.C.I.S., 18 Henley Road, Edmonton, London, N.18.
HARLOW AND DISTRICT RADIO SOCIETY, c/o Mr. H. Ivan Wright, Follys, Cock Green, Great Parndon, Harlow, Essex.
*HARROW RADIO SOCIETY, c/o Mr. S. C. Phillips, 131 Belmont Road, Harrow Weald, Middx.
*HOFFMANN GLOUCESTER ATHLETIC & SOCIAL CLUB (RADIO & ELECTRONICS SOCIETY) (G3IFH), c/o Mr. S. R. Boakes, Cambridge Villa, Bristol Road, Cambridge, Glos.
*H.M.S. ARIEL AMATEUR RADIO SOCIETY, c/o The Training Commander, H.M.S. Ariel, nr. Winchester, Hants.
*HOUNSLOW & DISTRICT RADIO SOCIETY, c/o Mr. R. J. Parsons, 16 Cypress Avenue, Whitton, Twickenham, Middx.
HULL AND DISTRICT RADIO SOCIETY (G3AMW), c/o Mr. J. Garbutt, 21 New Village Road, Cottingham, E. Yorks.
ILFORD & DISTRICT RADIO SOCIETY (G3QU), c/o Mr. C. E. Largen, 44 Trelawney Road, Barkingside, Ilford, Essex.
ILKESTON & DISTRICT AMATEUR RADIO SOCIETY (G3JSZ), c/o Mr. J. Eaton, 74a Station Road, Langley Mill, Nottingham.
ISLE OF THANET RADIO SOCIETY (G3DOE), c/o Mr. J. P. Barnes, 18 Grange Road, Ramsgate, Kent.
*JAMAICA AMATEUR RADIO ASSOCIATION (VP5RA), c/o Mr. T. Myers, 116 Harbour Street, Kingston, Jamaica, B. W. Indies.
KINGSTON & DISTRICT AMATEUR RADIO SOCIETY (G3KIN), c/o Mr. R. S. Babbs, B.Sc., 28 Grove Lane, Kingston-on-Thames, Surrey.
*KYNOCH RADIO & TELEVISION SOCIETY (G3HPP), c/o Mr. G. E. Nicholls, I.C.I. Ltd. Metals Division, Elliott Works, Selly Oak, Birmingham 29.
LANCASTER & DISTRICT AMATEUR RADIO SOCIETY, c/o Mr. B. Smalley, 8 Windermere Road, Carnforth, Lancs.
LEEDS AMATEUR RADIO SOCIETY (G3BEW), c/o Mr. J. M. Gale, 104 Bentley Lane, Meanwood, Leeds 6.
*LEICESTER RADIO SOCIETY, c/o Mr. N. Wibberley, 21 Pauline Avenue, Belgrave, Leicester.
LINCOLN SHORT WAVE CLUB (G3IXH), c/o Mr. S. Harrison, 4 Main Avenue, Bracebridge Heath, Lincoln.
LIVERPOOL DIOCESAN REGIMENT, CHURCH LADS' BRIGADE (G3SCA), c/o Col. E. C. Arden, 5 Canning Place, Liverpool 1.
LOTHIANS RADIO SOCIETY, c/o Mr. J. Good, 24 Mansion House Road, Edinburgh 9, Midlothian.
LOWESTOFT & BECCLES AMATEUR RADIO CLUB (G3IFI), c/o Mr. P. Hayward, 58 Edgerton Road, Lowestoft, Suffolk.
LOUGHBOROUGH COLLEGE RADIO SOCIETY, c/o Mr. R. Bray, The Elms, Elms Grove, Loughborough, Leics.
MANCHESTER & DISTRICT RADIO SOCIETY, c/o Mr. K. Brockbank, 17 Burleigh Road, Stretford, Manchester, Lancs.
MEDWAY AMATEUR RECEIVING & TRANSMITTING SOCIETY (G2FJA), c/o Mr. H. G. Cheeseman, 265 Cliffe Road, Strood, nr. Rochester, Kent.
MERSEYSIDE RADIO SOCIETY, c/o Mr. J. B. Trueman, 141 Ince Avenue, Liverpool 4, Lancs.
MIDLAND AMATEUR RADIO SOCIETY, c/o Mr. C. J. Haycock, 360 Portland Road, Edgbaston, Birmingham 17.
*MURPHY RADIO SPORTS CLUB, c/o Mr. J. Burton, "The Grange," Cecil Crescent, Hatfield, Herts.
NIGERIA RADIO CLUB, c/o Mr. N. A. Faminu, 69 Jebba Street (East) Ebute Metta, Nigeria.
NORTHAMPTON SHORT WAVE RADIO CLUB (G3GWB), c/o Mr. A. J. Kightley, B.Sc., 23 Garrick Road, Northampton.
*NORTH KENT RADIO SOCIETY, c/o Mr. C. J. Leal, 1 Deepdene Road, Welling, Kent.
*NORTH WEST KENT AMATEUR RADIO SOCIETY, c/o Mr. B. Herbert, 18 Leamington Close, Bromley, Kent.
NORWICH & DISTRICT RADIO CLUB (G3JGI), c/o Mr. P. J. Gowen, 71 Links Avenue, Hellesdon, Norwich, Norfolk.
*NOTTINGHAM UNIVERSITY RADIO SOCIETY (G3DBP), c/o Mr. P. W. Smith, The Union Room, University of Nottingham, University Park, Notts.
OXFORD & DISTRICT AMATEUR RADIO SOCIETY, c/o Mr. J. Hickling, 47 Banbury Road, Oxford.
PORT OF LONDON AUTHORITY STAFF CLUB (G3HXL), c/o Mr. R. T. Seaton, Lighterage Section, Port of London Authority, Northern Dept., Millwall Dock, Poplar, London, E.14.
*PORTSMOUTH & DISTRICT RADIO SOCIETY, c/o Mr. L. Rooms, 51 Locksway Road, Milton, Portsmouth, Hants.
PRESTON RADIO SOCIETY, c/o Mr. E. D. Evans, 44 Oakwood Drive, Fulwood, Preston, Lancs.
*PYE MARINE AMATEUR RADIO CLUB (G3JRM), c/o Mr. D. W. McKay, School Road, Oulton Broad, Lowestoft, Suffolk.
QUEEN MARY COLLEGE ELECTRONICS & AMATEUR RADIO SOCIETY (G4RG), c/o Mr. D. Jennings, Queen Mary College, Mile End Road, London, E.1.
QRP SOCIETY, c/o Mr. J. Whitehead, 92 Rydens Avenue, Walton-on-Thames, Surrey.
RADIO SOCIETY OF THE UNIVERSITY COLLEGE OF LEICESTER, c/o Mr. F. Kanopka, University College of Leicester, University Road, Leicester, Leics.
RAVENSBOURNE AMATEUR RADIO CLUB (G3HEV), c/o Mr. J. H. F. Wilshaw, 4 Station Road, Bromley, Kent.
REDDITCH AMATEUR RADIO SOCIETY (G3CEE), c/o Mr. S. L. Stubbs, 143 New Road, Bromsgrove, Worcs.

*R.E.U. RADIO CLUB, c/o S/Ldr. Copeland, R.E.U. R.A.F. Henlow, Beds.
ROMFORD & DISTRICT AMATEUR RADIO SOCIETY, c/o Mr. N. O. Miller, 55 Kingston Road, Romford, Essex.
ROMFORD RADIO SOCIETY (G4KF), c/o Mr. N. Miller, 55 Kingston Road, Romford, Essex.
ROYAL AIR FORCE AMATEUR RADIO SOCIETY (G8FC), c/o Mr. R. F. Weston, R.A.F. Locking, Somerset.
*ROYAL AIR FORCE, RAIGMORE, RADIO CLUB (GM3IXR), c/o P.O. McCallum, R.A.F. Station, Raigmore, Inverness, Scotland.
ROYAL AIR FORCE HABBANIYA AMATEUR RADIO CLUB (YI2AM), c/o Cpl. R. Pattinson, A.16, C.East, 276 S.U.R.A.F. Habbaniya, M.E.A.F.19.
ROYAL AIR FORCE, STOKE HOLY CROSS, AMATEUR RADIO CLUB (G3JUS), c/o 4058497 Cpl. Spencer, R.A.F. Stoke Holy Cross, Framingham Earl, Norwich, Norfolk.
*ROYAL AIR FORCE, YATESBURY, AMATEUR RADIO SOCIETY (G3HWF), c/o Mr. K. Smith, No. 2 Radio School, R.A.F. Yatesbury, Calne, Wilts.
*SALISBURY & DISTRICT SHORT WAVE CLUB (G3FKF), c/o Mr. H. G. Futcher, 171 Castle Road, Salisbury, Wilts.
SCARBOROUGH AMATEUR RADIO SOCIETY (G4BP), c/o Mr. P. B. Briscombe, Roseacre, Irton, nr. Scarborough, Yorks.
SHEFFIELD AMATEUR RADIO CLUB, c/o Mr. C. Leadwood, 103 Bodmin Street, Sheffield 9, Yorks.
SHEFFORD & DISTRICT AMATEUR RADIO SOCIETY (G3FJE), c/o Mr. G. R. Cobb, Lilac Cottage, 7 Hitchin Road, Shefford, Beds.
SLADE RADIO SOCIETY (G3JBN), c/o Mr. C. N. Smart, 110 Woolmore Road, Stockland Green, Birmingham 23, Warwicks.
SOUTH COAST RADIO CLUB (ZS5SCB), c/o Mr. H. A. H. Dollenberg, First Avenue, Port Shepstone, Natal, S. Africa.
SOUTHEND & DISTRICT RADIO SOCIETY (G5QK), c/o Mr. P. C. Baldwin, 13 Inverness Avenue, Westcliff-on-Sea, Essex.
SOUTH MANCHESTER RADIO CLUB (G3FVA), c/o Mr. M. Barnsley, 17 Score Street (late Cross Street), Bradford, Manchester 11, Lancs.
SOUTH SHIELDS & DISTRICT RADIO CLUB (G3DDI), c/o Mr. W. Dennell, 12 South Frederick Street, South Shields, Co. Durham.
SPEN VALLEY & DISTRICT RADIO AND TELEVISION SOCIETY, c/o Mr. N. Pride, 100 Raikes Lane, Birstall, nr. Leeds, Yorks.
S.R.D.E. AMATEUR RADIO SOCIETY (G3DMZ), c/o Mr. A. E. Rhodes, S.R.D.E., Christchurch, Hants.
*STOCKPORT RADIO SOCIETY, c/o Mr. G. R. Phillips, 7 Germans Buildings, Buxton Road, Stockport, Ches.
*STOKE HEATH AMATEUR RADIO CLUB (G3ITZ), c/o Sgt. A. Reid, Sgts' Mess, No. 291 M.U., R.A.F., Stoke Heath, nr. Market Drayton, Shropshire.
STOURBRIDGE & DISTRICT AMATEUR RADIO SOCIETY, c/o Mr. A. K. Davies, 48 Church Avenue, Vicarage Road, Amblecote, nr. Stourbridge, Worcs.
*STUDENTS' UNION RADIO SOCIETY, c/o Hon. Secretary, Northern Polytechnic and National College of Rubber Technology, Holloway, London, N.7.
SURREY RADIO CONTACT CLUB (CROYDON), c/o Mr. S. A. Morley, 22 Old Farleigh Road, Selsdon, South Croydon, Surrey.
SUTTON & CHEAM RADIO SOCIETY, c/o Mr. F. J. Harris, 143 Collingwood Road, Sutton, Surrey.
*THAMES VALLEY AMATEUR RADIO TRANSMITTERS SOCIETY, c/o Mr. K. A. Rogers, 21 Links Road, Epsom, Surrey.
*TORBAY AMATEUR RADIO SOCIETY, c/o Mr. L. H. Webber (G3GDW), 43 Lime Tree Walk, Newton Abbot.
*UPTON HOUSE SCHOOL RADIO CLUB, c/o Mr. R. H. Lamb, 17 Queens Road, Leytonstone, London, E.11.
*VICKERS-ARMSTRONGS LTD. (WEYBRIDGE) SOCIAL & ATHLETIC CLUB (ELECTRONICS SECTION) (G3IVW), c/o Mr. A. W. Warner, Sales Accounts Dept., Weybridge Works, Weybridge, Surrey.
WARRINGTON & DISTRICT RADIO SOCIETY, c/o Mr. J. Williams, 22 Ackers Road, Stockton Heath, Warrington, Lancs.
WEST KENT AMATEUR RADIO SOCIETY, c/o Mr. H. F. Richards, 17 Reynolds Lane, Tunbridge Wells, Kent.
WIRRAL AMATEUR RADIO SOCIETY, c/o Mr. A. C. Wattleworth, 17 Iris Avenue, Claughton, Birkenhead, Ches.
WOLVERHAMPTON AMATEUR RADIO SOCIETY (G8TA), c/o Mr. R. P. Thomas, 91 Fraser Street, Bilston, Staffs.
WORTHING & DISTRICT AMATEUR RADIO CLUB, c/o Mr. J. F. Wells, 37 Salvington Gardens, Worthing, Sussex.
YEOVIL AMATEUR RADIO CLUB (G3CMH), c/o Mr. D. L. McLean, 9 Cedar Grove, Yeovil, Som.
YORK AMATEUR RADIO SOCIETY (G3HWW), c/o Mr. J. O. Yarker, 14 Bewlay Street, Bishopthorne Road, York.

*Denotes Secretary's name and address subject to confirmation. Corrections or amendments to this list should be sent to R.S.G.B. Headquarters.

Second Top Band Contest, 1955

THE Second Top Band Contest will be held on November 12 and 13. Details of the rules were published on page 129 of the September issue.

What Do You Know?

Answers to questions set on page 162

1. A counterpoise is intended to act as an electrical balance for an aerial. It is usually located between the aerial and earth. In the so-called "ground-plane" aerial, the vertical element may be regarded as the aerial proper, while the "ground-plane" may be said to constitute a counterpoise.

2. To the practical engineer, the current flows always from positive to negative through the conductor. To the physicist, it often becomes necessary to consider the flow of electrons in a vacuum device incorporated in a circuit and the current is then better regarded as an electron flow from negative to positive.

3. "Superhet" is a contraction of "supersonic heterodyne," a term originally used to define the type of receiver in which a carrier is heterodyned to generate a frequency above the audible limit, this supersonic frequency being better suited for amplification than the carrier frequency.

4. Five.

5. Hiram Percy Maxim (W1AW).

6. An aeroplane, or any other metal object, reflects radiation only when its size is appreciable in comparison with the wavelength. At wavelengths of more than about 20 metres, a modern aeroplane is ineffective as a reflector.

7. Each lamination is coated with insulation and this prevents the flow of transverse induced currents. These currents, if allowed to flow in the core, would cause serious power loss and dangerous heating.

8. A 6-volt car battery when on charge normally registers 6.3 volts. By designing the heaters for 6.3 volts it was realised that indirectly-heated valves could be operated not only by a.c. supplies but also from car batteries in mobile equipment.

9. Sir Oliver Lodge.

10. There is no difference.

11. A "jar" is an obsolete term used as a measure of capacitance: it originated in the use of the Leyden jar as a standard capacitor in the days of spark transmission.

12. An American term for a grid-bias battery.

13. The heating is due to mechanical bombardment of the anode by electrons emitted from the cathode: it is not due to electrical resistance.

14. "Talk back" is caused by minute vibrations of the core and the windings due to magneto-mechanical effects.

15. (i) Due west; (ii) East-north-east.

16. Any metal which is not ferromagnetic.

17. An aluminium surface forms a microscopic coating of transparent oxide as soon as it is exposed to the atmosphere: ordinary fluxes are unable to remove this oxide film.

18. These are the two "fixed" wavelengths on which British amateurs were authorized to operate until the early 1920's.

Forthcoming Events

REGION 1

Blackpool (B. & F.A.R.S.).—October 25, 7.30 p.m., 351 Whitegate Drive, Blackpool.
Bury.—November 10, 7.30 p.m., 52 The Drive, Seedfield, Bury.
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., Tarran Hut, Y.M.C.A., Chester.
Crosby.—Tuesdays, 8 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo.
Isle of Man (I.o.M.A.R.S.).—October 19, November 2, 16, Manor Guest House, Victoria Road, Douglas.
Lancaster (L. & D.A.R.S.).—November 2, 7.30 p.m., George Hotel, Torrisholme.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., St. Barnabas Hall, Penny Lane, Liverpool, 15. **(M.R.S.).**—October 26, November 9, 23, 8 p.m., Larkhill Mansion House, Queens Drive, Liverpool, 13.
Manchester (M. & D.R.S.).—November 7, 7.30 p.m., Brunswick Hotel, Piccadilly. **(S.M.R.C.).**—Fridays, 7.45 p.m., Ladybarn House, Mauldeth Road, Manchester, 14.
Preston.—October 21, November 4, 18, 7.45 p.m., "The Copper Kettle," Garstang Road, nr. Barton.
Rochdale (R.R.T.S.).—Fridays, 7.45 p.m., 1 Law Street, Sudden.
Southport.—Thursdays, 8 p.m., Sea Cadets Camp, Esplanade, Southport.
Stockport (S.R.S.).—October 26, November 9, 23, 8 p.m., The Blossoms Hotel, Buxton Road, Stockport.
Warrington (W. & D.R.S.).—October 20, November 3, 17, 7.30 p.m., King's Head Hotel, Winwick Street, Warrington
Wirral (W.A.R.S.).—October 19, November 2, 16, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—October 28, November 11, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—October 25, November 8, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Catterick.—Wednesdays, 7 p.m., Loos Lines, Catterick Camp.
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.
Doncaster.—November 9, 7.30 p.m., Y.W.C.A., Cleveland Street.
Gateshead.—Mondays, 7.30 p.m., Mechanics' Institute, 7 Whitehall Road.
Hull.—October 25, November 8, 7.30 p.m., "Rampant Horse," Paisley Street.
Leeds.—Wednesdays, 7.30 p.m., Swarthmore Educational Centre, Woodhouse Square.
Middlesbrough (T-S.A.R.C.).—Alternate Fridays, 8 p.m., Settlement House, 132 Newport Road, Middlesbrough.
Pontefract.—October 20, November 3, 8 p.m., Queen's Hotel, Tanshelf.
Rotherham.—Wednesdays, 7 p.m., "Cutler's Arms," Westgate.
Scarborough.—Thursdays, 7.30 p.m., Chapman's Yard, Waterhouse Lane (off North Street).
Sheffield.—October 26, 8 p.m., "Dog and Partridge," Trippet Lane. November 16, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spenborough.—October 19, November 16, 7.30 p.m., Temperance Hall, Cleckheaton, November 2, Visit to Psychology Dept., and Electron Microscope, Leeds University.
York.—Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South).—November 4, 7.30 p.m., A Committee Room, Messrs. Cadbury Bros., Bournville Lane. **(M.A.R.S.).**—October 18, 7 p.m., Midland Institute, **(Slade).**—October 28, November 11, 7.45 p.m., Church House, High Street, Erdington.
Coventry.—October 28, 7.30 p.m., Priory High School. **(C.A.R.S.).**—October 24, November 7, 7.30 p.m., 9 Queen's Road.
Kenilworth, Warwick and Leamington.—October 20, 7.30 p.m., Dalehouse Lane, Leamington.
Malvern.—November 7, 8 p.m., "Foley Arms."
Redditch.—November 1, 8 p.m., "Scale & Compasses," Birchfield Road, October 20, 8 p.m., 10 Woodland Road.
Rugby.—November 3, 7.30 p.m., B.T.H. Recreation Club, Hillmorton Road.
Solihull.—October 31, November 14, 7.30 p.m., Defence H.Q., Sutton Lodge, Blossomfield Road.
Stoke.—October 26, 8 p.m., "Lion's Head," John Street, Hanley.
Stourbridge (St.A.R.S.).—November 1, 8 p.m., King Edward VI School
Walsall.—October 26, November 9, 8 p.m., Technical College, Bradford Place.
Wolverhampton.—October 24, November 7, 8 p.m., Stockwell End, Tettenhall.

REGION 4

Alvaston.—Tuesdays, Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, nr. Derby.
Chesterfield.—Tuesdays, 7.30 p.m., Bradbury Hall, Chatsworth Road
Derby (D. & D.A.R.S.).—Wednesdays, 7.30 p.m., Derby College of Arts & Crafts, Subbasement, Green Lane.
Ilkeston (I. & D.A.R.S.).—Thursdays, 7 p.m., Room 5, Ilkeston College of Arts & Crafts.
Leicester (L.R.S.).—October 24, November 7. 7.30 p.m., Hollybush Hotel, Belgrave Gate.
Lincoln (L.S.W.C.).—October 5, November 2. 7.30 p.m., Technical College, Cathedral St.
Mansfield (M. & D.A.R.S.).—No November meeting.
Newark.—November 6, 7 p.m., Northgate House, Northgate, Newark
Northampton (N.S.W.C.).—Fridays, 7 p.m., Clubroom, 8 Duke Street.
Nottingham.—October 21, November 18, 7.30 p.m., Sherwood Community Centre, opposite Woodthorpe Drive, Sherwood.
Peterborough.—November 2, 7.30 p.m., 21 Hankey Street.
Worksop.—November 3, 7 p.m., King Edward Hotel.

REGION 5

Chelmsford.—November 3, 7.30 p.m., Marconi College, Arbour Lane, Chelmsford.
Lowestoft and Beccles (L. & B.A.R.C.).—October 26, November 9, 7.30 p.m., Y.M.C.A., Lowestoft.

REGION 6

Gloucester (G.R.S.).—Thursdays, 7.30 p.m., The Cedars, 83 Hucclecote Road, Gloucester.
Jersey, C.I.—October 25, 7.45 p.m., Chamber of Commerce, Royal Square, Jersey.
Oxford (O. & D.A.R.S.).—October 26, November 9, 7.30 p.m., Club Room, "Magdalen Arms," Iffley Road, Oxford.
Portsmouth.—Tuesdays, 7.30 p.m., British Legion Club, Queen's Crescent, Southsea. (Clubroom open every evening.)
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.

REGION 7

London.—October 28, November 11, 6.30 p.m., I.E.E., Victoria Embankment. (For details see display announcement.)
London (L.M.L.C.).—October 21, November 18, 12.30 p.m., Bedford Corner Hotel, Bayley Street, Tottenham Court Road, W.C.1.
London (U.H.F. Group).—November 3, 7.30 p.m., Bedford Corner Hotel, Bayley Street.
Acton, Brentford and Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick, W.4.
Barnes, Putney and Richmond.—November 4, 337 Upper Richmond Road, S.W.14.
Bexleyheath.—October 27, November 10, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Bromley (N.W.K.A.R.S.).—November 4, 8 p.m., Shortlands Hotel, Station Road, Shortlands, Kent.
Chingford.—October 28, November 11, Venue from G4GA (SIL 5635) or B.R.S.19675 (SIL 6055).
Chislehurst and Sidcup.—Details from G3ANK.
Croydon (S.R.C.C.).—November 8, 7.30 p.m., "Blacksmith Arms," 1 South End, Croydon. (Talk on Amateur D/F.)
Dorking.—Tuesdays, 7.30 p.m., 5 London Rd.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway, W.5.
East Ham.—November 1, 12 Leigh Road.
East Molesey.—November 2, 8.30 p.m., Carnarvon Castle Hotel. ("Carnarvon Trophy" Constructors' Contest.)
Enfield.—October 16, November 20, 3 p.m., George Spicer School, Southbury Road.
Finsbury Park.—October 18, 7.30 p.m., 16 Albion Road, Stoke Newington, N.16.
Guildford and Woking.—October 23, 3 p.m., Royal Arms Hotel (Junk Sale).
Hendon and Edgware.—Wednesdays, 8 p.m., 21 Goodwins Avenue, Mill Hill.
Hoddesdon.—November 3, 8 p.m., "Salisbury Arms."
Holloway (G.R.S.).—Mondays (R.A.E.) and Fridays, 7 p.m., Grafton School, Eburne Road, N.7.
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road.
Kingston (K. & D.R.S.).—Alternate Wednesdays, 7.45 p.m., Penrhyn House, Penrhyn Road.
Lewisham (R.A.R.C.).—Wednesdays, 8 p.m., Durham Hill School, Downham.
Norwood.—October 15 ("A Weekend on the Moon," G2WS), November 19 ("Transformer Design," B. Kersting), 7.30 p.m., Windermere House, Westow Street, Crystal Palace.
Southgate and Finchley.—November 10, Arnos School, Wilmer Way.
Slough.—November 1, Venue from G2HOX or G3BTP, 13 Quaves Road.
Sutton and Cheam (S. & C.R.S.).—October 18, November 15, The Harrow, Cheam Village.
Welwyn Garden City.—November 1, 8 p.m., Council Office.

REGION 8

Brighton (B.D.R.C.).—Tuesdays, 7.30 p.m., "Eagle Arms," Gloucester Road.
Isle of Thanet (I.o.T.R.S.).—Fridays, 7.30 p.m., Hilderstone House, Broadstairs.

REGION 9

Bath.—October 24, November 21, 7.30 p.m., 12 Pierrepoint Street.
Bristol.—October 21, November 18, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol, 1.
Exeter.—November 4, 7 p.m., Y.M.C.A., St. David's Hill.
Falmouth (W.C.R.C.).—Alternate Tuesdays, 7 p.m., Technical Institute (next meeting October 18).
North Devon.—November 3, G2FKO, 38 Clovelly Road, Bideford.
Plymouth.—October 15, November 19, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.
Torquay.—October 15, November 19, 7.30 p.m., Y.M.C.A., Castle Road.
Weston-super-Mare.—November 9, 7.30 p.m., R.A.F.A.R.S., R.A.F. Locking.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

Cardiff.—November 14, 7.30 p.m., "The British Volunteer," The Hayes. (Junk Sale and discussion of winter programme.)
Neath and Port Talbot.—November 1, 7.30 p.m., Royal Dock Hotel, Briton Ferry.

REGION 13

Dunfermline.—Thursdays, 7.30 p.m., behind 34 Viewfield Terrace, Dunfermline.

REGION 14

Falkirk.—October 28, November 11, 7.30 p.m., The Temperance Café, High Street, Falkirk.
Glasgow.—October 28, 7.15 p.m., Christian Institute, 70 Bothwell Street, Glasgow, C.2.

Letters to the Editor . . .

HRO Modifications

DEAR SIR,—I was most interested to read Mr. MacIntosh's letter in the June BULLETIN, and Mr. Derrick's article in the April issue.

The faithful HRO in my possession underwent a major transformation towards the end of last year and a brief outline of the present valve line-up may be of interest: First r.f. amplifier—6AM6; second r.f. amplifier—6BA6; mixer—6AM6; oscillator—6C4; first and second i.f. amplifiers—6BA6s; detector a.g.c. and first a.f. amplifier—6AT6; output—6AM5. A 6AK5 was used as the b.f.o. solely because it was to hand. A QS150/15, mounted under the chassis, stabilises both oscillator and mixer screen-grid voltages.

A 6BA6, without a.g.c., was originally employed as first r.f. amplifier but subsequent comparison with a 6AM6 resulted in the latter being adopted. Experimentation with the first r.f. amplifier well justifies the time spent, since this stage primarily determines the noise factor of the receiver and hence its absolute sensitivity.

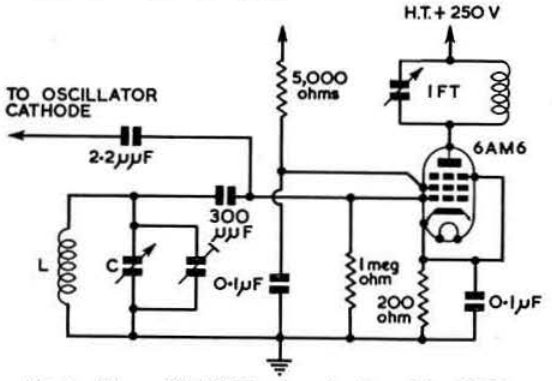


Fig. 1. The modified HRO mixer circuit used by G3EGQ.

The mixer stage is worth comment. The original circuit employs screen grid injection of the oscillator voltage but this system is relatively inefficient. Other types of mixer circuits were therefore considered and the most satisfactory circuit appears to be that shown in Fig. 1.

It will be seen that a high slope r.f. pentode is employed, with both oscillator and signal voltages applied to the control grid. Grid leak bias is provided and the oscillator voltage is not particularly critical for satisfactory operation. Good frequency stability and freedom from "pulling," together with considerable improvement in conversion gain may be obtained with this circuit. Stabilisation of the mixer screen-grid supply was found desirable.

As a result of Mr. Derrick's article, all the fixed capacitors were replaced, but with little noticeable benefit. It must therefore be assumed that they were in good shape before the change. The only test equipment used in the HRO modernisation comprised a signal generator and a multi-range meter.

A receiver so modified, using current valve types, should perform in a manner comparable to present day receivers. It is hardly necessary to say in conclusion that such modifications entail much patience and an ability to predict the results of various circuit changes

Yours faithfully,
D. J. GRIFFEN (G3EGQ, ex-VS7GQ).

Bournemouth, Hants.

Stabilized Power Supplies

DEAR SIR,—May I just add a "final, final" to Mr. P. G. Day's very excellent article on "Stabilized Power Supplies," which was published in the July issue.

For any reader desiring to build an electronic stabilizer from materials to hand in the spare parts cupboard, to obtain the best possible regulation, the qualities to look for in the *series regulator valve* (V3 in Fig. 2, page 11), are high slope (*gm*) and low resistance (*ra*). There have been (and no doubt, still are) special valves produced for this particular purpose and one—the CV73—is quite often to be found for sale (ex-Government) very cheaply. It has a slope of 7.5 mA/V, a 4 volt heater and a British 7 pin base connected as follows:—top cap A, pins 2 G_1, 4 and 5 heater, 6 cathode and beam plates, 7 G_2; pins 1 and 3 are blank.

The fact that the heater requires a 4 volt supply, need not be a deterrent to the use of the valve as, regardless of the type of valve, an *isolated* heater winding is necessary. When this is being added to the transformer, it is merely a case of "putting on" less turns than would be required for a 6.3 volt type.

Yours faithfully,

Hastings, Sussex. G. RIPLEY (G3KFW).

M.A.R.S. Stations

DEAR SIR.—I note from a recent letter from G2BVN to the Editor of *QST*, that he enters a "plea for the removal outside the ham bands of the M.A.R.S. stations in Europe and Africa who clutter up our frequencies with high power stations passing military traffic only. These messages generally relate to the movement of troops and supplies, etc. These stations use amateur call-signs and are prevalent on the 20 metre band . . . "

I would like to call your readers' attention to the fact that we Ws faced a similar situation in regard to M.A.R.S. stations in the Canal Zone (KZ5) in the usurpation of our amateur bands for their official military traffic. After considerable protest we were able to get a directive issued *prohibiting all military traffic on amateur frequencies.*

Might I suggest that your members contact the offending station and remind him of

M.A.R.S. Directive—BC No. 44—291700Z/June '53

which should easily be found in the M.A.R.S. station files.

Yours faithfully,

JOHN KNIGHT (W6YY, M.R.S.G.B.)

La Canada, California, U.S.A.

QSL Cards

DEAR SIR,—I received June R.S.G.B. BULLETIN about a week ago, and noticed quite a few letters in there concerning QSL cards. I am of the school of thought that the QSL card is the most important part of any QSO. My policy in the past, and will remain in the future, to QSL to all those who send their QSL to me, and to QSL SWL reports 100 per cent. If a QSO is worth putting valuable time, equipment, and power into, it certainly rates a few seconds to write out a QSL card. One of my many contacts was with a KG6, for my only contact in that country, and Zone. I managed to get one of his blank QSL cards, filled it in, put postage stamps on it, addressed to myself, and then mailed it in an air mail envelope to him. All he had to do was drop it in the post, so it would be postmarked from Guam. To make it short, I'm still in need of a QSL from KG6. This is the type of fellow that should be black listed by the hams of the world, and no one QSO him. I have found that the American hams, no matter what part of the world they are operating from, are the biggest offenders in QSLing. The best hams to work for a QSL are any stations in Europe, as I have found they QSLd to me at better than 90 per cent. Hope the rest of the world will advance to this percentage some day.

There are quite a few countries with awards for working all the states in their respective country, such as U.S.(WAS), France(DPF), Brazil(WAB), Canada(WAVE). How about one for working all the British counties. I know *Short Wave Magazine* issues one to stations working all counties on 160 metres, but how about R.S.G.B. issuing one for working them all on other bands? Being a native of Kent I am quite interested in working G stations, and have worked a good many, and even though there is no award for working the counties, have made an attempt at working them all. Hope you might consider this.

Yours faithfully,

Philadelphia, 36, Penna. PHILIPPE A. BATES (W3SOH).

N.F.D. Results

DEAR SIR,—It is disappointing that no reference to N.F.D. results appears in the current (September) issue of the Journal, more especially as this is the copy which in recent years (except 1953) has covered in detail the many facets of this great national competition.

If, as I believe, the present Contests Committee are hard pressed in their free time, which is eaten up more and more by the demands for results of the many contests run by the Society, it is a *sine qua non* that competitors too, find that the time to prepare for the next round is also eaten up by months of waiting for the results of their earlier efforts.

The winner of N.F.D. or any other contest is only assured of his position when the results are notified, and any amount of guessing or dissemination of claimed scores as a build up in the meantime, is merely indicative of the keenness shown by all who participate in these events, which require careful preparation and attention to detail, as well as a modicum of administrative and technical ability if the goal is to be brought into view.

The Contests Committee having made the rules, and the competitors having played the game, is it really expecting too much to ask that the results be posted more promptly?

Unless the organizers themselves are inspired and zealous in their efforts right to the end, there is bound to be a fall in the numbers competing, which is noticeable at present, in the case of N.F.D.

No amount of excuses will alleviate the impatience which members feel in regards to this and other similar problems, and which, if they continue, will weigh heavily against the more remote and least organized members participating in future competitions.

Lateness is neither conducive to organization, nor is it good publicity for our many overseas colleagues who contribute to our pastime and pleasure, and who I like to think, still look to us for a lead.

If the Committee are unable to fulfil their obligations to the members, then they must co-opt suitable volunteers to assist them in the discharge of their duties.

It is no use reporting the facts two months late under the heading *Council Proceedings:* as members, we should be informed immediately any difficulties confronting the affairs of the Society, and in many cases suggestions and help would be forthcoming from the membership to bridge the gap.

Perhaps the " News Service " which is to be inaugurated on 3600 kc/s will help to ease things a little; certainly we should not have to wait longer than one month for news of the activities and difficulties of the executive council.

On the subject of free time, it is as well to note that the inquest on N.F.D. and nomination of R.S.G.B. Representatives, will probably require two meetings in each Town and Area this year, whereas one has sufficed previously, and some members have to travel a distance to be present, which eats up more of their spare time.

Maybe I am pessimistic, but the article on *Le Snobisme* was the most perfunctory piece of editorial literature I have ever read from the Journal over my breakfast, and no doubt others feel the same way.

" Deeds not words," should be our motto, so what say?

Yours faithfully,

South Norwood, London, S.E.25. D. DEACON (G3BCM).

The Chairman Replies

(Mr. Deacon's letter was passed on to the Chairman of the Contests Committee for his reply. Here it is—Ed.).

Mr. Deacon (G3BCM) is not alone, for it is usual for people to decide a point and then proceed to produce arguments to support that decision.

To deal with the paragraphs as they arise:—No. 1—it is! That's the Committee's point of view. No. 2. So what? It is possible to conceive that both sides can reach breaking point. No. 3. Yes! No. 4. No, but it's another thing to carry it out. No. 5. There's an ugly suggestion here that they're not, without any evidence to support the premise, and the second point—is there? No. 6. The last part is also a common attribute " we won the football match " says the spectator—Mr. Deacon leads the world by paying his subscription. No. 8. Another has written this before, only he did even better, he supplied names to fit various jobs, but, on enquiry, none was willing to undertake the tasks allotted. Two newly co-opted members, for quite good personal reasons, found they can't carry on. The Committee remains at 7 members (including Honorary Secretary) to do everything. No. 9. It must take two months before *Council Proceedings* can appear in the BULLETIN. I like the last bit, now we have evidence of it. No. 10. Maybe. No. 11. So even ordinary members have their problems. Committee members are ordinary members, except that they have contest problems on top of the others.

Now some evidence for Mr. Deacon. B.E.R.U. was done practically by one man this year—I joined him for about 8 hours only—and there are very few who know what weeks of work that means. The D.F. Final took over 1,000 miles of private motoring and was run in between N.F.D. judging—there was also a 2 metre contest and a 420 Mc/s contest on at about the same time. N.F.D. took hundreds of man-hours wading through a pile of papers 18in. high. When the results were beginning to emerge an awkward snag arose and it took six weeks or more to resolve it. This put the whole of the Committee's tightly packed schedule out of gear; results have to come out to a time-table. This must also have been an embarrassment to the Editor. Whilst ordinary members enjoyed this summer, Committee members spent sweltered evenings over other peoples' mistakes on the top floor of New Ruskin House. I don't suppose there is one member of the Contests Committee who wouldn't throw his hand in if it wasn't for the fact that Contests are an important side to the Society's life and as its been these last few years, if one member seceded it would only throw more burden upon the others, whose friendship and co-operation one values from close association.

The Honorary Secretary is an " unwilling, pressed man " with far more personal commitments than most and only carries on because it takes a lot of experience to be a Contest Honorary Secretary—until we can produce another competent to take over.

I hope the day will soon come when the members won't mind a further 2/6 subscription to allow the staff to be increased and the secretarial work taken out of voluntary hands.

" Deeds not words," as Mr. Deacon says.

The Committee was very sorry, before Mr. Deacon, that N.F.D. results were delayed—but they couldn't be published " half-baked."

W. H. MATTHEWS (G2CD)
Chairman, Contests Committee

Novice Licence

DEAR SIR,—I was surprised to see the two letters in the August issue which disagreed with the earlier suggestion for the introduction of a Novice Licence.

I believe that the best way of learning operating procedure and transmitter design and operation as required for the use of the station permitted by a full licence would be the operation of a simple low power transmitter.

A suitable transmitter would be no more lethal than most receivers and certainly the experience obtained would reduce the later dangers from larger rigs.

Most beginners do find some difficulty in reaching the required 12 w.p.m. This difficulty is often a result of their being unable to find suitable assistance for their practice.

I suggest that the issue of Novice Licences would remove much of the temptation towards piracy and that the disadvantages involved would be far outweighed by the advantages.

Yours faithfully,
W. N. WALKER (G3HTJ).

Gt. Malvern, Worcs.

V.H.F.'s and N.G.R.'s

DEAR SIR,—I am taking up the cudgels against an old friend —and a former colleague both on the Contests Committee and in v.h.f. activities—in replying to Mr. Scarr's letter in the August issue, but it seems necessary to present a different viewpoint on some of his comments, and to correct an erroneous statement.

Firstly, Mr. Scarr's statement regarding the necessity of " numerous mathematical calculations . . . (involving the extraction of square roots . . .)" is without foundation. In addition to the arithmetical method, a simple graphical method was described in the July BULLETIN, and a reference to the descriptions accompanied the rules of the recent Field Day.

It is true that errors can occur in map reading and in exchanging figure groups. But, what has happened to our operating ability if we cannot exchange groups with accuracy? Heaven help us (and the Service) if we should ever have to handle cipher! Surely accuracy is the first essential in any communications activity.

Reading a map is equally necessary whether the N.G.R. or the " ruler and map " method is employed. The " ruler and map " method is, admittedly, quicker than even the graphical N.G.R. method, but, for comparable accuracy, its use presupposes the availability of a map of adequate scale, covering both locations on one sheet. That is not so easy a proposition for long distances. Errors can soon be considerable if separate map sheets have to be fitted together, if the sheet is folded, or if the town one's correspondent " is 5 m. S.E. of " is not marked.

Contrary to Mr. Scarr's view, the change of system will, in fact, assist the Committee in checking distances, since the N.G.R.'s of both locations will be available on the same log. In a recent two metre event, the writer had to check a large number of distances, and much more time was spent in map reading and in checking from log to log than in the calculations (by the N.G.R. method, of course!).

Contest scoring systems are always difficult. It is never possible to give equal chances to entrants in populated and in isolated areas. Some of the experiments made by the Committee have been failures, and the injured entrants have rapidly pointed out the error of our ways! The one point per mile system for v.h.f. events, however, has been almost universally acclaimed as the best to date.

Mr. Scarr is probably partially correct in ascribing the absence of logs from some of the stations active to the task of preparing the entry. The Committee would dearly like to see logs from all active stations. This absence of logs is by no means a recent development. The writer, among others, has over quite a number of years, attempted to persuade more people to send logs, but many operators seem to be under the impression that, unless they have been active throughout a contest, their logs are not wanted. Let it be quite clear that, however small, *any* log of contacts made during *any* contest is very welcome. If it is complete with declaration, etc., it will appear in the results as an entry. If, for any reason, the operator does not wish his call to appear in the table, all we ask is the list of contacts with times and reports, and " Check Log " as a heading.

Entries for the 1955 Second Two Metre Field Day—the first with this N.G.R. rule—is the largest for any Second Two Metre Field Day, and is closely equal to the average for all Two Metre Field Days.

We may be wrong, but to date, at least, it is " not proven."

Yours faithfully,

Beckenham, Kent. T. LYELL HERDMAN (G6HD).

The Amateur Sound Licence

DEAR SIR,—With reference to E. H. Wedlock's (ZD2EHW) letter in the July issue of the BULLETIN, I am afraid that he is optimistic in thinking that a licence is automatically granted whilst in the U.K. on leave.

I had been licensed in Malaya for several years and applied for a U.K. licence when on leave during 1954. Even though I produced written evidence to this effect, I was promptly and politely told it could not be granted unless I had passed the R.A.E. Admittedly in Malaya one does not have to pass the written examination to obtain a licence, but I believe that a large portion of the present G operators have obtained their licences under similar circumstances.

I would like to suggest that the Council of R.S.G.B. take up this matter with the U.K. authorities on behalf of your overseas members.

Yours faithfully,

Kuala Lumpur. S. A. FAULKNER (VS2DB) (*Hon. Editor, Malaya Radio Amateurs' Newsletter*)

[*Editorial Note.*—The Post Office were invited to contribute an official reply to Mr. Faulkner but did not avail themselves of the opportunity. It is understood however, that to ensure that amateur stations are properly operated, the Postmaster General issues licences only to persons holding certain technical and Morse qualifications. These qualifications are required to be held by all amateurs operating in this country and it is difficult to see how a temporary licence issued to persons not possessing these qualifications could be justified. The G.P.O. do accept Commonwealth licences as exemption for the Radio Amateurs' Examination and/or the Morse Test if they know that equivalent examinations must have been passed to obtain the Commonwealth licences concerned. However, in some Commonwealth countries conditions are such that it is not necessary to insist on the same qualifications as the Post Office do. Licences issued by these administrations cannot, therefore, be accepted as exempting qualifications.

When Mr. Faulkner writes of " a large portion of present G operators " having obtained their licence without an examination he may be thinking of pre-war operators; but since the R.A.E. was introduced, new licences were only granted to persons having sat this, or having the recognised exempting qualifications.]

New Book

GUIDE TO BROADCASTING STATIONS, 1955-56. Compiled by the Staff of *Wireless World*. Eighth Edition. Published for *Wireless World* by Iliffe & Sons, Ltd. Size 7¼in. x 4¼in. 80 pages. Available from R.S.G.B. Headquarters. Price 2s. 6d. net (postage 3d.).

Since publication of the last edition there have been a very large number of changes in the operating frequencies of broadcasting stations throughout the world. This fact, together with the number of additional stations now in service, has necessitated a complete revision of the information included in the eighth edition.

All the 650 stations operating on long and medium waves are listed both in order of frequency and geographically. As a point of interest, nearly 50 per cent of the medium-wave broadcasting stations in Europe are operating on frequencies not allocated to them under the international plan drawn up at Copenhagen in 1948. These stations are marked in the frequency list.

Some 1,600 short-wave broadcasting stations are also listed, with their call signs, in order of frequency and geographically.

Although of mainly academic interest to listeners and viewers in this country, operating details of Europe's 300 or more v.h.f. broadcasting stations and 130 television transmitters are also included. Another useful feature is the table giving standard time for all countries operating broadcasting stations.

The information given in this book was secured from many sources and has been checked against measurements made at the B.B.C. receiving centre at Tatsfield, Surrey.

Silent Keys

LESLIE BAXTER (G8HG)

With sorrow we record the death on September 14, 1955, of Mr. Leslie Baxter (G8HG) of Sale, Cheshire. Many amateurs owe him a debt of gratitude for the Morse classes he ran from 1934 to 1939. He was a first-class operator and was well known on 7 Mc/s, the only band he used. He was first licensed as 6HG in the early 1920's.

Our sympathies are extended to Mrs. Baxter.

G3AO.

JOHN C. LUCAS (ex-VS2AR)

The death occurred on September 22 of Mr. John C. Lucas, of Leicester, who was well known before the war as VS2AR. He had been a member of the Society since 1937 and retained his enthusiasm for the hobby up to the time of his death.

Sympathy is extended to his daughter, Mrs. J. Charlton.

ROBERT SNEDDON (GM8AH)

We record with deep regret the death at the age of 56 of Mr. Robert Sneddon (GM8AH). To within a short time of his last illness Mr. Sneddon was active on 144 Mc/s. His passing will be mourned by his many friends by whom he will be remembered as a very keen v.h.f. enthusiast.

The Society was represented at the funeral by Messrs. James Sey (GM8MJ), John Kyle, D.F.M., A.F.M., B.E.M. (GM6WL) and David Ross Macadie (GM6WD).

To his widow and family we extend our sympathy in their sudden bereavement.

GM6MD.

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A GUIDE TO AMATEUR RADIO. (Sixth Edition.) Complete information for the Newcomer. Chapters include An Introduction to Amateur Radio, Simple Equipment (Receivers and Transmitters), How to Obtain a Licence, The Radio Amateurs' Examination, Learning Morse, Operating an Amateur Station, Amateur Abbreviations and International Prefixes. **Price 2/6 (by post 2/9).**

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