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R.S.G.B. BULLETIN

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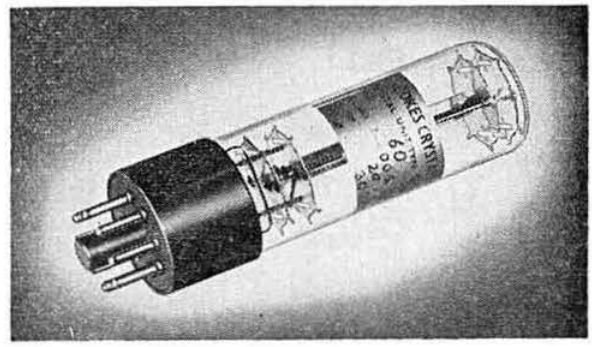

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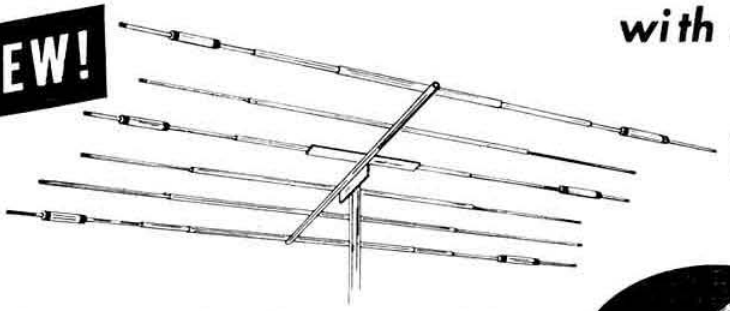

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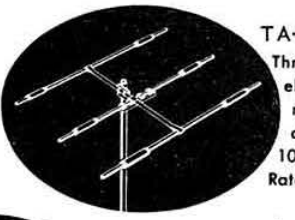

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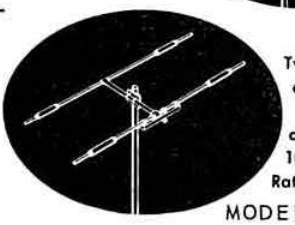

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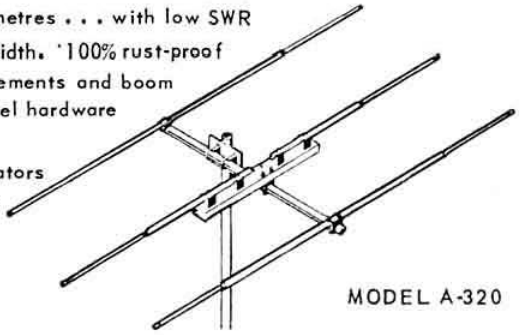

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Headquarters Accommodation

A Message from the President

FOR many years it has been obvious to successive Councils that the present accommodation for the Society Headquarters is both inadequate and unsuitable, and the same fact must have forcibly struck the many members of the Society on visiting the top floor of New Ruskin House for the first time. Accommodation which would permit members, be they from London, the country or abroad, to meet in a congenial atmosphere, where the contents of the Society's library could be read at leisure, is clearly desirable, while the increase in efficiency of the work of the Headquarters staff which would result from an amelioration of the existing cramped and confined working conditions would be of the greatest benefit to all Society members, wherever they are located.

The same thought has also struck Mr. Maurice Child, a Vice-President of the Society, who on page 136 has written a most opportune and far-seeing letter to the Editor on the subject of Headquarters accommodation. In addition to the financial offer made by Mr. Child, the promise of a very substantial sum of money for the purpose of establishing new Headquarters has also been received from another member.

It must not be thought that Councils have been idle during these past few years; indeed, acutely aware that the present position must be improved, they have viewed and rejected numerous premises because they were not satisfactory for a Society Headquarters in all respects.

A completely suitable property was, however, found very recently but had to be rejected for the sole reason that, at the moment, the Society does not possess enough money to make such a purchase financially feasible. It is clear that if the Society is to avoid a repetition of such a situation the Council must be in a position to take advantage of offers as they occur, for as members will know, such opportunities are invariably fleeting. This position of financial strength, I believe, can be achieved in only one way and that is to establish a Fund, administered and run separately from all other monies of the Society, for the sole purpose of helping to provide a permanent Society Headquarters.

The Golden Jubilee of the Society will be celebrated in 1963 and from answers to the questionnaire recently circulated to all members, it is obvious that many also feel that a lasting memorial in the form of permanent Headquarters premises, would be a most satisfactory manner of marking this great occasion.

It would perhaps be over-optimistic to hope that sufficient money could be collected in two years, but as I sincerely believe that there must be many members willing and indeed, eager to donate to a fund, which would enable the Society to provide premises in keeping with the requirements of the Headquarters of Amateur Radio in Great Britain—thus ensuring the Fund was well based—the object will be achieved.

The Council has, therefore, decided to establish forthwith a Society Headquarters Fund and to invite all members to contribute. A form of donation to this fund is enclosed with this issue of the R.S.G.B. BULLETIN. A list of donors will be published each month omitting, however, the individual amounts donated, so that all members will be kept informed of the progress of the Fund. Donations however small will be appreciated, and in any form, whether by direct payment or by a future bequest most suitable to the convenience of the donor.

This is the first time the President or the Council of the Society has ever made an appeal of this nature. As I mentioned in a previous message to you, my activities over the last 15 years have permitted me to appreciate, probably more than most of you, the work the Society has done, and continues to do, for your benefit. I sincerely hope that you will respond to this call, for by so doing, not only will you visibly confirm your appreciation of the work which goes on in your interests, but you as a radio amateur, whether you are in the North of Scotland, the Midlands or the South, must benefit directly from the enhanced service to your hobby and the valuable asset which our own Headquarters will represent.

ERIC S. COLE,
President

A Reflectometer for 145 Mc/s

By R. C. HILLS, B.Sc. (Eng.), A.M.Brit.I.R.E. (G3HRH)*

FOR many years the amateur has been able to measure such quantities as voltage and current, and to determine the performance of most sections of his transmitter by this means, together with other measurements with such devices as the oscilloscope, test oscillator, valve voltmeter, and other equipment of that nature. One aspect of measurement has, however, always presented considerable difficulty, namely the measurement of impedance, because of the extreme accuracy with which impedance bridges must be constructed if they are to give significant results.

* *73 Warren Way, Digswell, Welwyn, Herts.*

The instrument described in this article was developed from a suggestion by the Technical Development Sub-Committee.

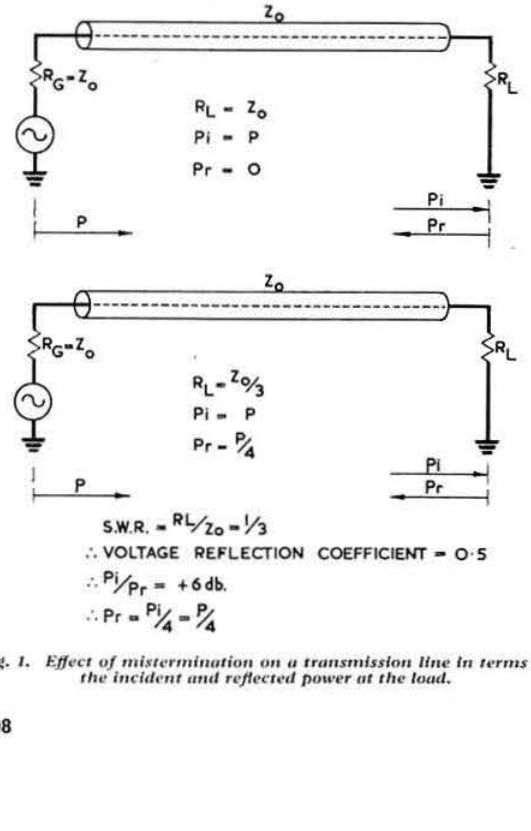
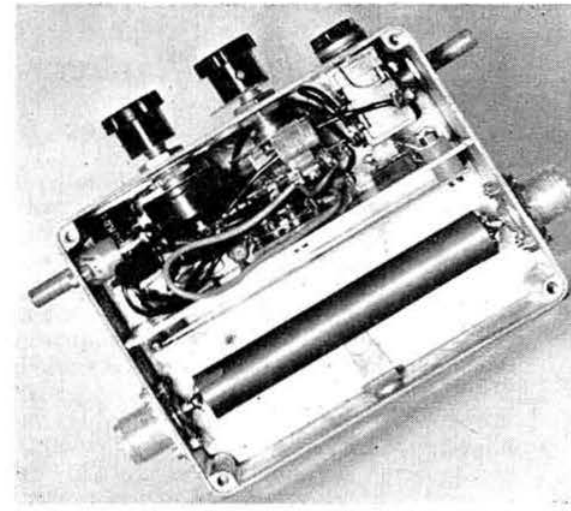


Fig. 1. Effect of mistermination on a transmission line in terms of the incident and reflected power at the load.



A reflectometer for 145 Mc/s constructed in an Eddystone die-cast box The components may be identified by reference to Fig. 9.

The development of a device known as the reflectometer has provided the opportunity for the design of a relatively accurate impedance sensitive device which can be readily home-constructed, and the shorter wavelengths encountered in the v.h.f. bands enable such an instrument to be extremely compact while losing nothing in its sensitivity. The present article describes briefly the principle behind the reflectometer and gives details for the construction of such an instrument for use in the 145 Mc/s band.

When power at radio frequency is fed into a transmission line which is correctly terminated at its far end, this power is propagated along the line in terms of voltage and current waves and is all absorbed in the load at the far end of the line. This represents the ideal condition for the transfer of power from a transmitter to an aerial system: such a condition is rarely, if ever, achieved due to the impossibility of presenting the transmission line with an absolutely matched load. In practice, it is possible only to terminate the line with an aerial or load which approaches the perfect condition and under these circumstances a certain amount of power is reflected at this mis-termination and is propagated back down the line again by means of further waves of voltage and current travelling in the opposite direction, to be either absorbed or re-reflected at the generator according to whether the generator impedance terminates or misterminates the line.

The amount of power reflected from the aerial or load mis-termination is directly proportional to the magnitude of the mismatch on the line, and therefore the mismatch on the line or, in more practical terms, the standing wave ratio, may be expressed in terms of the ratio of the forward or "incident" and the backward or "reflected" powers. (Fig. 1.)

If the s.w.r. $= S$, then the voltage reflection coefficient K is given by

$$K = \frac{1-S}{1+S} \qquad \ldots\ldots (i)$$

Clearly if a device can be constructed which will differentially respond to power in terms of direction, then such a device can be used directly to measure standing wave ratio, and the ratio M of incident to reflected power is given by

$$M = 20 \log_{10} 1/K \ db \qquad \ldots\ldots (ii)$$

It can be shown that if a line, whose length is short compared with a wavelength, is introduced into the field of, and

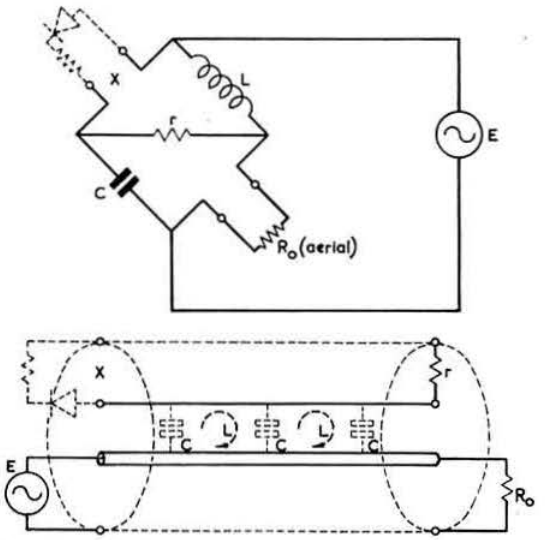


Fig. 2. Maxwell Bridge representation of transmission line coupler.

parallel to another line which is carrying power, then an amount of power is coupled into the secondary line, which is directly proportional to the magnitude of the power travelling in either or both directions on the main line [1]. The configuration of main and sampling lines may be regarded as a Maxwell Bridge, the reactive arms of which are provided by the distributed capacitance C and mutual inductance L of the coupled lines, and the effective load on the bridge is r (Fig. 2). Then if $r^2 = L/C$, the bridge is effectively balanced at all frequences, and no power from the generator E appears in the load r, but a proportion appears in the detector load. If two such subsidiary lines are coupled to a main transmission line carrying power and are respectively terminated at opposite ends, an output can be taken from each line which is respectively proportional to the incident and reflected power in the main line. This is the principle behind the reflectometer. (Fig. 3.) The accuracy of such an instrument depends upon the correct termination of the sampling lines. Any mismatch on those lines will result in a standing wave along them, and consequently the r.f. voltages appearing at their output terminals will not be proportional to the forward and reflected powers. This parameter of performance is termed the *directivity* of the reflectometer, and is measured as the ratio of the voltage developed on the " backward " sampling line, when the instrument is itself correctly terminated, to the voltage on this same line when the instrument is reversed. The directivity is usually expressed as a ratio in db.

Design

Before the details of construction can be finalized, it is necessary to consider one or two design aspects of the instrument itself. It has already been shown how two voltages may be obtained which are proportional to the forward and backward components of power respectively. However these voltages are still of a radio frequency nature, and it is necessary to convert them to d.c. before they can be used to deflect a conventional meter. If the " forward " voltage is arranged to produce f.s.d. on the indicating meter, then clearly the meter can be calibrated directly in s.w.r. by observing the deflection produced by the " backward " voltage, and making due allowance for any differences in coupling between the two sampling lines and the main line. This calibration will be valid independent of the actual transmitted power, since in each case the meter is adjusted for f.s.d. In practice it is easier to arrange for identical sampling lines, in which case the calibration of the meter becomes a simple question of the ratio of r.m.s. voltages applied at the rectifying diodes. This places an inherent limit on the sensitivity of the instrument at low s.w.r. but, provided that the relative couplings can be measured, it is possible to improve the overall sensitivity for a given power and meter sensitivity by arranging for an appreciably greater degree of coupling on the " backward " sampling line than on the " forward," and thus providing an immediate improvement of x db in the lowest s.w.r. which can be measured for a given deflection of the meter (Fig. 4). Care must be exercised that the coupling from either lines is not increased to the point where the presence of the sampling line distorts the electromagnetic field around the inner of the main line sufficiently to cause an effective change of Zo of the main line and hence introduce an inherent s.w.r. in the instrument itself. As a general rule the coupling should not be greater than 30db to maintain an inherent reflection coefficient of less than 3-4 per cent.

When the main line is carrying power which is subject to amplitude modulation, then the sampling voltage from the " forward " (and *ipso facto* the " backward ") line will also be subject to amplitude modulation at the same modulation depth. Since this voltage has already been rectified and arranged to deflect the indicator meter to full scale, then if this rectified (or detected) signal is once more rectified, a d.c. voltage will be obtained which is proportional to the audio frequency voltage modulating the carrier. This voltage can then be used to deflect the meter and the meter can be calibrated directly in percentage modulation. This calibration will also, to a first order, be independent of the transmitted power, since the meter has been adjusted for

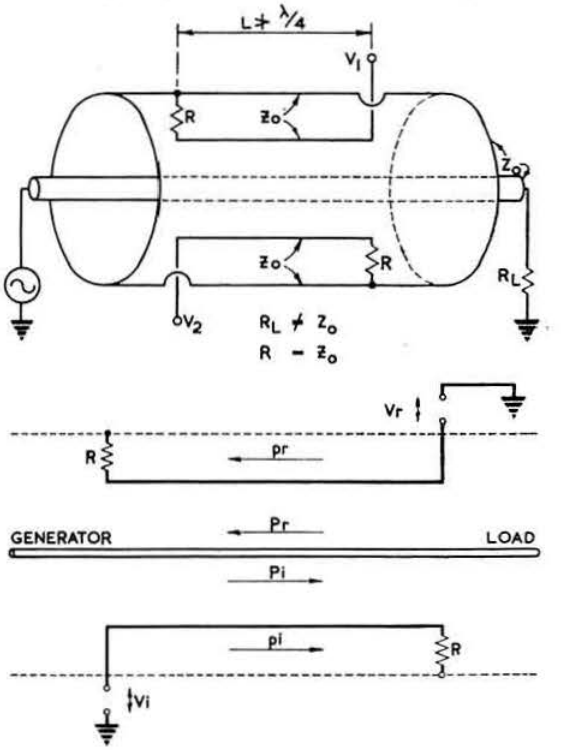


Fig. 3. Arrangement of sampling lines to respond respectively to incident and reflected powers.

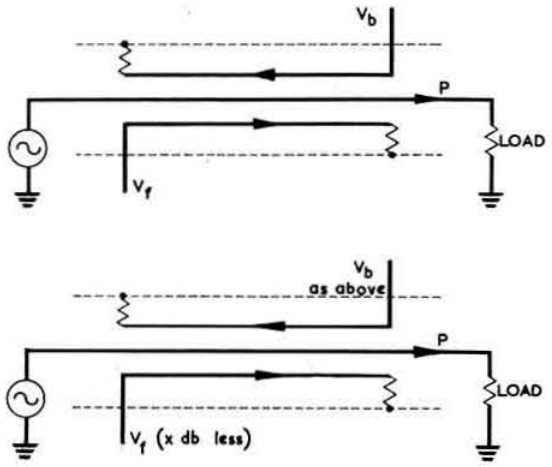


Fig. 4. Instrument sensitivity and coupling ratios.

(a) Sampling couplings equal.
V_f gives meter f.s.d. ∴ s.w.r. V_b/V_f, say y db . . . . . (i)
y db corresponds to a given meter deflection.

(b) Samplings couplings different by x db.
V_f gives meter f.s.d. less x db for same power.
S.w.r. ∝ V_b/meter f.s.d. ∴ for same deflection as (a), s.w.r. = x + y db . . . . . (ii)

f.s.d. on the sampled detected carrier. In practice it is necessary to resort to full-wave rectification of the detected carrier, although this does not really provide sufficient d.c. voltage to cause large excursions of the meter reading under full modulation conditions, i.e. it is not possible to advance the meter to f.s.d. for 100 per cent modulation. It is recommended therefore that the " modulation meter " aspect of the instrument be regarded only of an arbitrary quantitative nature. Further development work on this section of the instrument, possible incorporating an a.f. transformer, may overcome this difficulty.

The introduction of the instrument into a transmission line requires the use of plugs and sockets, and this in turn turn will lead to a discontinuity in the line at the ends of the reflectometer proper, due to the sudden transition from the relatively large inner of the instrument line to the inner of the co-axial fitting. The size of the inner conductor of the instrument must be large to maintain the line characteristic impedance while at the same time providing sufficient room to accommodate the sampling lines between the inner and outer conductors, i.e. this is a physical requirement. These discontinuities are of the " right angled step " type (Fig. 5)

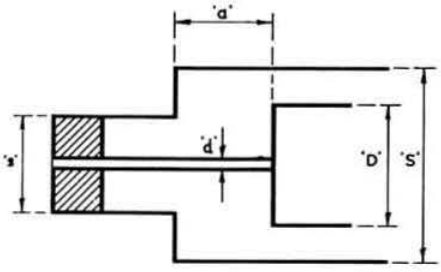


Fig. 5. Optimum step length at a discontinuity.
$Z_o = 138 \log_{10} s/d = 138 \log_{10} S/D$. Optimum step length a is a function of Z_o, D/d.

and there is an optimum arrangement of dimensions to provide minimum reflection at the step for any given characteristic impedance and inner conductor ratio. There is no simple arithmetical formula relating the step-length " *a* " to these parameters, and anyone wishing to design an instrument about different values is recommended to study the published information [2] from whence the correct value for a 72 ohm line was extracted.

Construction

It was decided that the constructional design of the reflectometer should be based entirely on readily available materials and components, and should require no more than average ability and work bench facilities in its assembly. There should be no machined parts and all soldered connections should be adequately made using an electric iron and resin-cored solder, i.e. no hard-soldering or brazing should be necessary. Accordingly, it was decided to house the instrument in an Eddystone die-cast box, approximately 4½ in. × 3½ in. × 2 in. (Cat. No. 650) and to utilize part of the box as the outer of the main line. The greatest sensitivity with least distortion of the field is achieved by using as long sampling lines as possible (up to a maximum of a quarter wavelength) and so the main line was arranged to run the length of the box. The computation of *Zo* for co-axial lines with round inner and rectangular outer conductors is complicated when the outer conductor has unequal dimensions, and it was decided to partition the die-cast box lengthwise to form a square section outer conductor of side 2 in. The expression for the characteristic impedance of a co-axial line with cylindrical inner and square outer is

$$Zo = 138 \log_{10} L/d \quad \ldots\ldots (ii)$$

where L = side length, d = inner diameter and $L/d > 1{\cdot}5$. Substitution of 2 in. in this formula gives $d = 0{\cdot}6$ in. and this is almost exactly achieved using standard domestic copper water pipe of ½ in. bore which has a nominal o.d. of 0·596 in. In addition such pipe has the great merit that it can be readily obtained from any plumber, an off-cut of 6 in. being ample for one instrument.

The r.f. connections to the box are made using Amphenol type SO239 co-axial sockets: it is important to use the variety having nylon loaded bakelite insulation (yellow) to avoid distorting the inner of the socket when the line connection is being soldered. These sockets are mounted centrally at each end of the 2 in. square section of the box, and their spigots are cut down so that the overall dimension from the inside face of the box to the end of the spigot is ¼ in. The ½ in. inner conductor (Fig 6, detail A) is slotted at each end for a depth of ⅛ in. and wide enough to accept 18 s.w.g. brass sheet as a tight fit: it is important to ensure that the slots at each end lie in the same plane. The small end pieces (Fig. 6, detail B), are cut from 18 s.w.g. brass sheet and pushed into the slots at each end as shown. They are then soft soldered in position, the pointed end of each tab tinned, and the surplus solder cleaned off the outside to restore the cylindrical shape at the ends. This inner assembly may then be rested between the spigots of the co-axial sockets, and soft-soldered in position: in the model illustrated, ample heat was obtained from two Adcola 60 watt irons in parallel to cause the solder to flow on the spigot and complete a sound joint.

The sampling lines are formed from a strip line of 18 s.w.g. brass lying parallel to the partition. The formula for the characteristic impedance of a strip line over an infinite plane is given as:

$$Zo = 230 \log_{10} 4D/W \quad \ldots\ldots (iii)$$

where D = distance from plane, W = width of strip and $0{\cdot}1 < D/W < 1{\cdot}0$. As already explained it is necessary correctly to terminate the sampling lines in order to preserve the

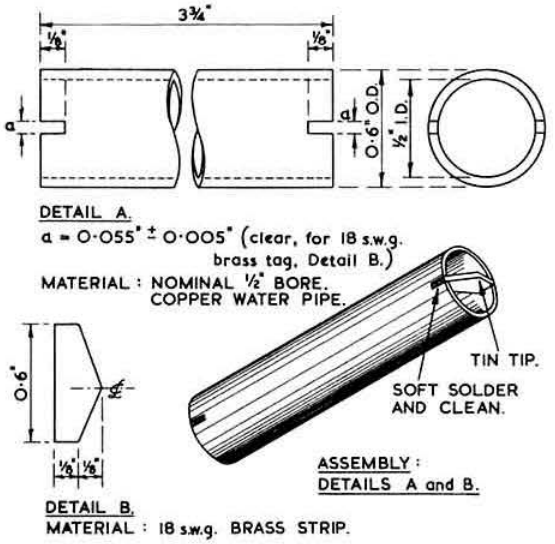


Fig. 6. Construction of main line inner conductor.

directivity of the instrument, and a characteristic impedance of 100 ohms was selected, based upon the use of available 100 ohm 2 per cent tolerance ½ watt resistors as the terminating loads. This figure substituted in expression (*iii*) gives a value of $D/W = 0{\cdot}68$. This provides a whole possible range of dimensions for the strip line and in order to achieve the required degree of coupling to the main line, a value of $D = 0{\cdot}25$ in. and hence $W = 0{\cdot}375$ in. was chosen by experiment. The sampling lines were made as long as conveniently possible, care being exercised to make them as near physically identical as could be determined.

The partition was manufactured from 16 s.w.g. aluminium sheet and the sampling lines mounted in the positions shown. The 6 B.A. lead-through insulator and line spacer is a section of polythene insulant from a ½ in. dia. co-axial cable, suitably drilled out. The spacing of the sampling lines may be trimmed by adjustment at the terminated end when the instrument is being set-up, although the prototype

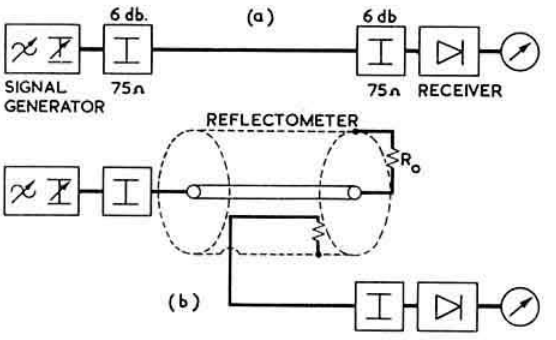


Fig. 7. Insertion method for measuring coupling.

(a) Set a signal generator attenuator to give an arbitrary deflection K on receiver meter. Note signal generator attenuator setting, say x db.

(b) Repeat with reflectometer in circuit and readjust signal generator to give same deflection K on receiver meter. Read attenuator setting, say y db.

(c) Then coupling of main line to sampling line = x − y db.

model appeared very tolerant, slight variations of spacing causing only small alterations in directivity on each line. The partition was assembled with sampling lines, tag board on rear, and all components, before being fitted into the box. Connections from the other side of the partition to the various controls were made up as short flying leads to facilitate this assembly. The position of the various potentiometers and switches is not critical, and some alteration to the suggested layout may be necessary if different sized components are employed. Alternatively, there would be no objection to extending the d.c. outputs of the sampling line rectifiers to another chassis be means of a three core cable: it is of course, essential that the initial diode rectifiers are located immediately at the feed-through bushes behind the partition, as shown in Fig. 8.

Calibration

Accurate calibration of the reflectometer requires a signal generator with calibrated output, a receiver with some form of carrier level meter, and a load of known reflection coefficient suitable for direct connection to either end of the reflectometer test line (this load should be as near matched as possible). The procedure is then as follows:

(*i*) Terminate the aerial end of the instrument, and measure the coupling of each sampling line in turn by the insertion method (Fig. 7). Adjust the sampling line spacing for identical coupling.

(*ii*) Using the signal generator injecting directly into each sampling diode in turn (with sampling lines disconnected), calibrate the indicating meter in terms of db relative to the

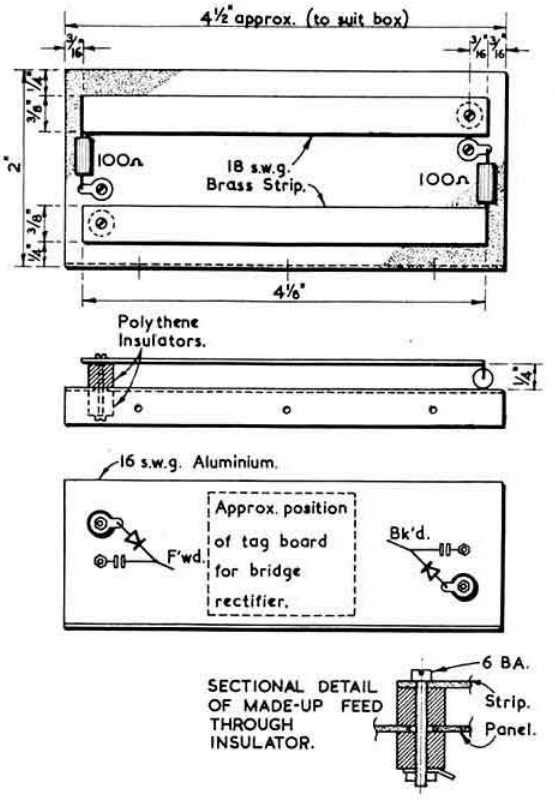


Fig. 8. Arrangement of strip line on supporting partition.

injection voltage for f.s.d. This provides also a check on the match of the diode characteristics of each sampling circuit. These must be matched if the instrument is to read accurately at all transmitted power levels: two diodes at random from the box provided the results quoted for the prototype. The instrument is then calibrated directly in terms of the ratio of backward to forward voltages, expressed in db, for all transmitted powers, provided it is always adjusted to f.s.d. on the forward position using the SET R.F. control. (The SET DEFLECTION control should be set, for any particular meter, to such a value as to allow the SET R.F. control to function over the whole range of transmitted powers expected.)

Many amateurs who construct this instrument will, of course, not have available to them the necessary test equipment outlined above, and it should be made clear that one cannot expect to make up such an instrument as the reflectometer, and, without proper calibration, expect to measure s.w.r. with *laboratory* accuracy. However, this need not detract greatly from the appeal of the instrument, since, even *without any calibration at all*, the output from the " backward " line will always reduce as the s.w.r. on the main line is reduced; thus the reflectometer may be used qualitatively to indicate best s.w.r. when adjustments are being made to, say, an aerial system.

It is possible, without any test equipment other than a low power transmitter, to make some basic checks on the instrument as follows:

With an open circuit on the aerial end of the instrument, vary the power from the transmitter in steps, and take at each level the " forward " meter readings with the instrument connected normally and then the " backward " meter readings *with the instrument reversed*. This will check the characteristic of the diodes, and also enable slight adjustments to be made to the sampling lines to equate the coupling. The latter adjustment should be carried out at the normal transmitter power only, for the best performance in practice. Care must be exercised when carrying out such checks, to avoid damaging the p.a. valve of the transmitter through excessive dissipation on no load. Provided that the dimensions given for the prototype have been followed closely, the errors introduced due to stray differences in final instruments should not be more than 2 or 3db. Inspection of the calibration table shows that, for the lower valves of s.w.r. such an error results in a very small error in s.w.r., this becoming increasingly worse as the s.w.r. gets larger. Therefore, an uncalibrated but carefully built instrument can be expected to indicate s.w.r. to an accuracy of $\pm$ 0·5 up to values of 2: 1 becoming as poor as $\pm$ 1·0 at 4 : 1, based on the calibration curve of the prototype. This should be quite adequate for most amateur uses.

The reflectometer described is designed for use in lines having a characteristic impedance of *72 ohms only*. Serious errors may ensue from its use in lines of any other impedance.

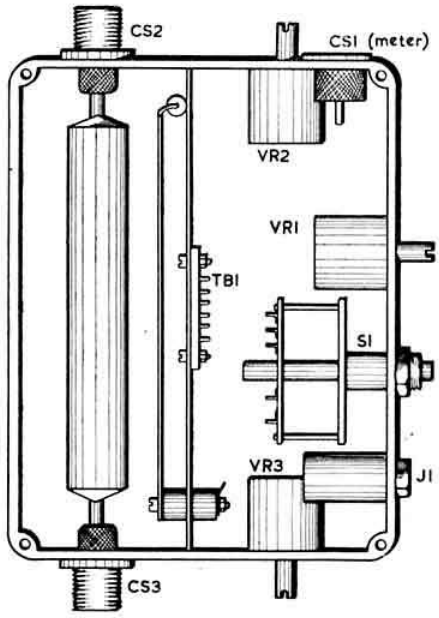


Fig. 9. General assembly of instrument.

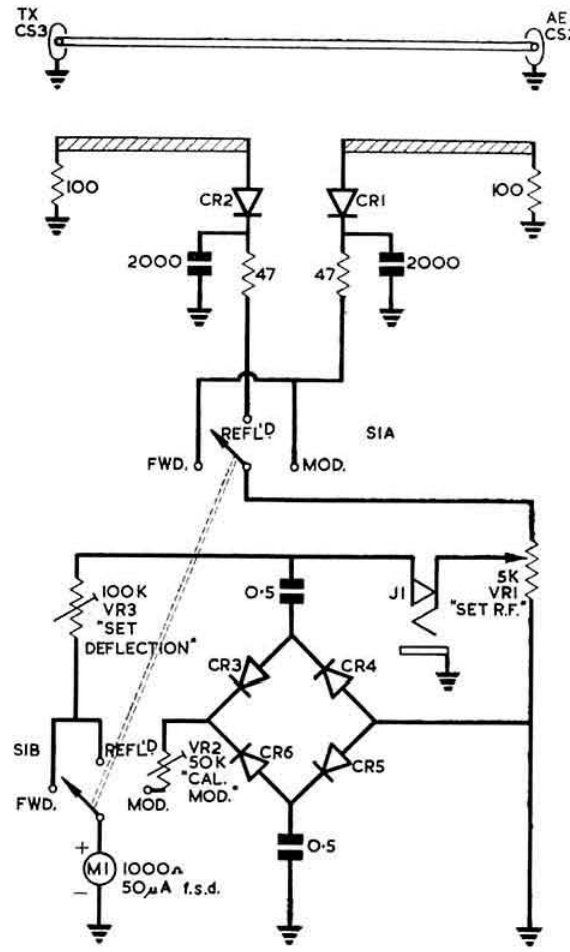


Fig. 10. Circuit diagram of reflectometer. CR1, 2, GEX66; CR3, 4, 5, 6, GEX66 or GEX54. CR3-6 should be bypassed by 1000pF capacitors across each diode.

Frequency Range

The performance of the instrument is constant over the 145 Mc/s band. No measurements have been carried out at other frequencies, but it is fair to say that the sensitivity will fall linearly with the decrease of frequency since the coupling lines are short. The impedance match of the instrument itself will deteriorate with increasing frequency

due to the presence of the step discontinuities, and also the variations in the terminating loads on the sampling lines, which will become increasingly reactive.

Performance

Figures quoted below are for the prototype as illustrated, and were obtained using the following equipment:

Signal Generator	Marconi Instruments TF995/A/2
Receiver	Eddystone 770R
Admittance Bridge	Wayne Kerr B901
Load	72 ohms co-axial resistor

All measurements were carried out at a frequency of 145·0 Mc/s.

Accuracy of impedance. This instrument is for lines of $Zo = 72$ ohms only.

Admittance measurements through a half-wave length of 72 ohm cable (normalized to 72 ohms).

	G_X	B_X
Load only	0·84	+0·1
Reflectometer and Load	0·84	+0·16

Reflection coefficient of instrument = 3 per cent (1·06:1)

Coupling of sampling lines.

Forward line to main:	−32db
Backward line to main:	−32db
Directivity of backward line:	38db

Reflectometer Calibration Table

Meter Reading Forward	Meter Reading Backward	Level (db)	S.W.R. *
50	50	0	infinite
43	44	−2	8·8
37	36	−4	4·4
30	29	−6	3·0
23	21	−8	2·3
18	17	−10	1·92
14	13	−12	1·67
11	10	−14	1·5
8	7	−16	1·37
6	5	−18	1·29
4	3	−20	1·22
3	2	−22	1·16
2	1	−24	1·13

*The s.w.r. column represents the conversion of "backward" meter readings for a "forward" reading of 50. For a given input level, the difference between lines was less than 1db over the full range. Zero level is equivalent to 1V r.m.s. in 100 ohms.

Power Limitations

The sensitivity of the instrument is such as to provide f.s.d. on a 50μA meter for a carrier power of 5 watts. The upper limit is set by the dissipation in the resistors terminating the sampling line. These are rated at ½ watt and, since the forward line is dissipating power 32db down on the incident transmitted power, the maximum transmitted power should not exceed 500 watts carrier.

The power ratings for a 50 μA meter are thus

Minimum: 5 watts carrier
Maximum: 500 watts carrier

References

[1] Monteath. *Proc. I.E.E.* Part B. May, 1955.
[2] Kraus. *J. Brit. I.R.E.* Feb., 1960.
[3] Matthews, Charman. R.S.G.B. BULLETIN, Dec., 1953. Feb., 1954.

Top Band Z Match

By R. F. BURNS (G3OOU)*

TOP Band stations use aerials which range from 30 ft. of wire in a loft with a loading coil to a dipole or a wire several hundreds of feet long. The unit described in this article will enable almost any aerial to be matched into a transmitter. The output of the unit may be connected to a dipole (with coaxial or tuned feeder) or to a long wire and earth/counterpoise system. A standing wave bridge is incorporated as an aid to correct matching. The circuit arrangement is shown in Fig. 1.

Construction

The unit is made on an aluminium chassis which is completely screened to prevent radiation of spurious signals. The output can be balanced or unbalanced. Broadcast receiver

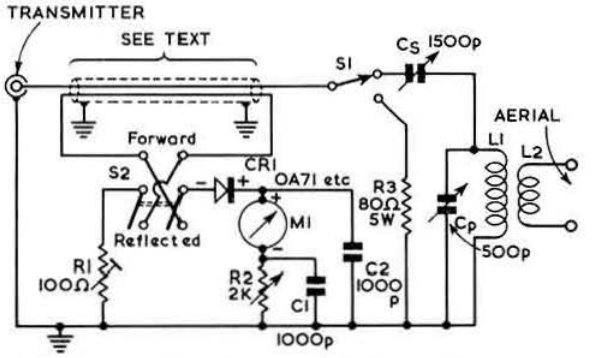


Fig. 1. Top Band Z Match Coupler. L1, 40 turns 18 s.w.g. enam. close wound on 1½ in. dia. former; L2, 25 turns 18 s.w.g. enam. close wound on top of L1 with suitable insulation; M1, 0-500μA f.s.d.; S1, s.p.d.t. switch; S2, d.p.d.t.

tuning capacitors are used but no evidence of arcing has been noticed, even on peaks of modulation. Ordinary ceramic stand-off insulators isolate the series capacitor from the chassis. The coil former can be any low loss type of 1½ in. outside diameter; the author uses a ceramic type.

S.W.R. Bridge

The s.w.r. bridge requires a fairly long length of coaxial cable unless a very sensitive indicating device is to be used to read the small values of reflected power. The cable can be of the semi-air spaced variety or the twin screened type. If the former is used, a piece of 22 s.w.g. enamelled copper wire must be inserted through one of the holes in the dielectric to couple energy to the diode and meter. The length of the coaxial cable must be selected bearing in mind the sensitivity of the meter, approximately 3 ft. being suitable for use with a 0-500μA meter. A carbon track variable resistor is preferable for VR1. All connecting leads should be as short as possible.

Adjustment

S1 is switched to the 80 ohm dummy load and the transmitter loaded up to 10 watts input. With S2 in the forward position, VR1 is adjusted for full scale deflection on the meter M1. S2 is then set to the reflected position and VR1 adjusted for a minimum reading. S1 is now set to the position shown in Fig. 1 with the aerial connected, the series and parallel capacitors are adjusted to give minimum reading on the meter, i.e. minimum reflected power. The aerial is now correctly loaded into the transmitter with the maximum amount of power reaching it.

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The RX60— A Modern German Receiver

By GERALD A. S. LANDER
(DJ0BF, G3OOH)*

A view of the RX60 receiver at DJ0BF.

THE RX60 receiver (together with its predecessor the RX57) is an attempt to place an amateur band receiver with sensitivity and selectivity within the reach of the average German amateur. This article will deal first with the reasons for the decision to design such a receiver, then go on to describe it from the technical point of view and finish with an account of the author's experience with the RX60 under actual operating conditions.

The Background Story

The availability of receivers suitable, however remotely, for amateur use has at no time in postwar Germany been as great as in Great Britain. This explains incidentally, why quite a few DL and DJ QSL cards contain the information " RX hr. 0-V-2." Some surplus British and American equipment is to be found, but the prices asked are, in the eyes of one accustomed to British surplus market prices, mostly exorbitant. The R107 and the BC348, for example, change hands for anything between DM200 and DM250 (roughly £17 and £21). Receivers from the German Wehrmacht can also be found in the " For Sale " columns of the magazines, but these are not available in the same numbers as their British counterparts. Two examples of ex-Wehrmacht receivers can be given here, almost certainly the best-known, namely the " Cäsar " and the " Köln." Both are eagerly sought-after for they both, especially the " Köln," have quite outstanding crystal filters. They are normally used in amateur circles as i.f./a.f. strips, a suitable converter being used as the " front end." A " Cäsar " in reasonable condition will, however, cost around DM250 (£21), whereas the " Köln " costs anything from DM800 to DM1000 (£67 to £120). This, despite the fact that the " Köln " enjoys an unequalled reputation in Germany for its crystal filter, is rather a high price to pay for a piece of service equipment nearly 20 years old!

More recently modern receivers have appeared on the German market, notably the Geloso G207 and G209, costing approximately the same price as in Britain, as well as a wide choice of American amateur receivers. These are, however, by no means cheap. Some comparison may be obtained from the fact that the Collins 75A4 with one filter costs as much as a brand-new Volkswagen standard model.

So much for the background story as far as the receivers themselves are concerned. One other point should, perhaps, be explained in order to clarify the position that the purely commercial business of building and selling a receiver can be sponsored by an amateur body such as the German national society, D.A.R.C. True to the tradition of Teutonic " thoroughness," Amateur Radio in Germany is more thoroughly organized than in England. It is not the purpose of this article to describe in great detail the general state of Amateur Radio in the German Federal Republic, but it is sufficient to say that the D.A.R.C. some years ago took it upon itself to arrange for the production of a row of " D.A.R.C. Standardgeräte " or equipment of especial interest to amateurs, for example valve voltmeters, at prices that could be afforded by German amateurs, especially the younger generation with their brand-new licences. The situation described above of the scarcity of good amateur band receivers led about six years ago to the request being made to the D.A.R.C. to postpone development work on test equipment and to concentrate instead on the production of a suitable amateur band receiver. Herr Georg Paffrath (DL6EG) who is responsible to the D.A.R.C. for all questions of a principally technical nature, was entrusted with the development work on the proposed receiver.

It is, of course, not sufficient merely to work out the circuit diagram of a receiver—a prototype must be produced and tested extensively and a firm must be found that is prepared to undertake the production of amateur equipment in the small numbers called for. (The author's RX60, for example, purchased in January, 1960, has the factory number 510.) Obviously a large radio and TV factory employing mass-production techniques to produce 600 to 700 sets a day is not likely to be interested in the amateur " drops " in a radio " ocean," neither is it to be expected that an amateur who pays £80 to £90 for an amateur band receiver will be satisfied if it has been manufactured according to mass-production principles. Anyone who has seen a broadcast receiver for domestic consumption on its way down the production line of a large radio factory will know what the author means! No—it would have to be a smaller, more specialized firm, willing to produce the equipment desired in the quantity desired and to produce it unit by unit. A suitable firm was indeed found and has been working harmoniously with the D.A.R.C. in the production of " Standardgeräten " for some years now. This firm, Max Funke, before the war a small but flourishing firm in what is now the Eastern Zone of Germany, started anew in the town of Adenau near Cologne after the end of the war, and was entrusted with the production of the first RX57 receivers in 1957.

The RX57

The result, then, of the extensive development work by DL6EG was the so-called " RX57." It is not proposed to

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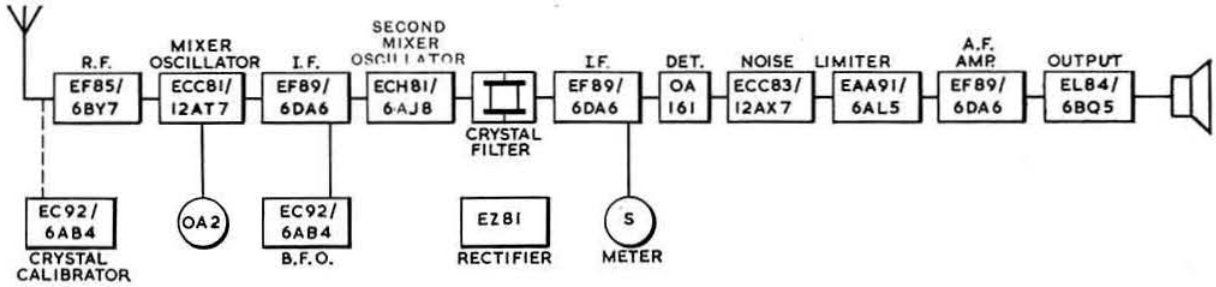


Fig. 1. Block diagram of the RX60 receiver.

discuss this forerunner of the RX60 in any great detail, but a short comparison with the block diagram of the RX60 (Fig. 1) will be made, as the circuit is basically the same and it is interesting to note how far the receiver has progressed technically in the past four years. Instead of the ECC81 (12AT7) additive frequency changer, the original RX57 employed an ECH81 in a standard triode-heptode mixer/oscillator circuit. The RX57 was a single conversion superhet with an i.f. of 1·6 Mc/s, and the i.f. amplifier itself deserves some mention. As the receiver was to be as inexpensive as possible, it was decided that a crystal filter would be out of the question and that some other means would have to be found of obtaining sufficient selectivity. The i.f. amplifier, therefore, was designed with five stages, of which only the last two (both of them using EF89/6DA6 pentodes) were actually used for amplification. The first three stages were ECH81's, and these were employed principally as a *Q* multiplier. The triode systems of these three valves were used to obtained the regeneration necessary for the desired *Q* multiplier effect, and the heptodes acted as buffers. Circuit *Q* values of 350 were reached by the use of suitable materials, and a bandwith control was provided which regulated the amount of regeneration. In its widest position the bandwidth was 5 kc/s, with no *Q* multiplier effect. In the 2 kc/s bandwidth position the bandpass curve had a skirt selectivity of 38db per kc/s.

The b.f.o. was originally one-half of an ECC81 (12AT7), the other half being employed as the 100 kc/s marker oscillator. One of the main reasons for subsequently changing this part of the circuit to two EC92 (6AB4) valves was that the marker oscillator could then be sold separately, with or without the receiver.

The only other difference between the original RX57 and the present RX60 was that the S meter was first placed in a bridge arrangement in the screen grid circuit of the a.f. pre-amplifier.

The RX57 cost DM795 (about £68), plus an optional DM68 (£5 16s.) for the 100 kc/s marker oscillator.

Transition from RX57 to RX60

The experience gained with the RX57 soon showed that, apart from the minor alterations and "teething troubles," there was the need for a basic alteration in the method used to obtain satisfactory selectivity. No one disputed that, for the price at which it was offered, the method used (i.e., the three stage *Q* multiplier) was the best solution, but opinion was that many would be prepared to pay an additional DM200 to own a receiver with a crystal filter. The RX57 had so often to be sent back to the factory for re-alignment, owing to the fact that more or less serious detuning had resulted from treatment received in transit from factory to amateur; not only this, but the replacement of one of the ECH81's or of a defective critical component could well also lead to the necessity of a re-alignment which, incidentally, would have been impossible for the normal amateur with the limited range of test equipment at his disposal.

In 1959, therefore, it was decided to design a "new" receiver, based on the RX57 but with double conversion and a triple crystal filter. It is here interesting to note that the manufacturers undertake, for a very reasonable price, the subsequent conversion of an RX57 into a RX60.

The Crystal Filter

The first and most difficult problem for DL6EG was the provision of a crystal filter at a price that would not necessitate prospective buyers having to give up all wordly pleasures for a year in order to be able to afford it. Filter crystals especially designed for this type of circuitry, would have been much too expensive, as they cost over DM100 (£8 10s.) each. For this reason, therefore, it was decided that ordinary surplus crystals, for example of the FT241 variety, costing normally DM2 (3s. 4d.) on the market, would have to be used. Experiments with these showed that, for the intended triple filter, the frequencies of the crystals would have to be exact to within ±50 c/s. This would therefore entail either etching or suitable sorting of the crystals. This latter solution was obviously the better one, for Max Funke could obviously afford to purchase comparatively large numbers of suitable crystals on the surplus market and then commence sorting them. The i.f. of the RX57 (1·6 Mc/s) was maintained as the now first i.f. of the new receiver, and approximately 460 kc/s was decided upon as the second i.f. This would also make possible the use of standard i.f. transformers of the type found in German broadcast receivers.

Fig. 2 shows the circuit diagram of the crystal filter. The i.f. transformers are normal Philips types, suitably altered on the secondary side. The lower of the two capacitors in the voltage divider on the secondary side has approximately 10 times the value of the upper one. From this capacitor the out-of-phase voltage, now reduced in value, is taken via a

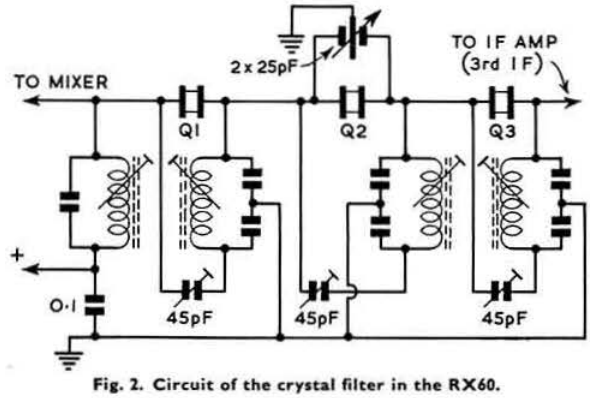


Fig. 2. Circuit of the crystal filter in the RX60.

45 pF trimmer and cancels out not only the internal inductive coupling but also the coupling effect caused by the parallel capacity of the crystal. The amount of voltage fed back can be regulated by means of the 45 pF trimmer. In this way it was made possible for the crystal alone to be effective in reducing the bandwidth. The bandwidth itself can be altered by means of the split-stator capacitor (2 × 25 pF) shown across the second crystal in the circuit diagram. With this capacitor the two associated tuned circuits are detuned against each other, resulting in a reduction in the crystal attenuation and therefore in the bandwidth. Similarly detuning all four tuned circuits of the crystal filter unit would have given steeper flanks to the bandpass curve in the

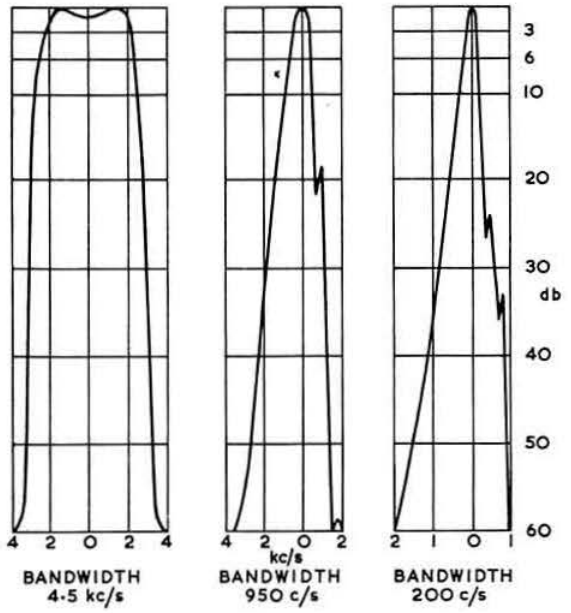


Fig. 3. Bandpass curves obtained with the crystal filter shown in Fig. 2.

" narrow " position, but this was not feasible for constructional and economic reasons.

The curves obtained with this triple filter unit are shown in Fig. 3. The crystals are matched not only in respect to frequency but also with due regard to any spurious responses they may have outside the desired bandpass curve. It was, however, not possible to suppress these completely, and this can be seen in the small spurious peaks on the right-hand flanks of the bandpass curves for 950 c/s and 200 c/s.

The RX60

The RX60 was designed solely for amateur band operation and therefore has each amateur band spread over approximately 10 in. of the dial. As the 160m band is not available normally for amateur use in the German Federal Republic, the standard version of the RX60 has the five bands 80m to 10m. The coil turret has, however, six positions, and for a very moderate additional fee a sixth band can be included. In the author's case, a band covering 1·75 to 3 Mc/s was built in, enabling not only the 160m band to be heard but also providing for checking the 100 kc/s marker oscillator against the three standard frequency stations (MSF, HBN and OMA) on 2·5 Mc/s.

The aerial input is for either 60 or 240 ohms (or for the unknown impedance of the nondescript " piece of wire " that is so often used with a receiver). The r.f. stage, an EF85 (6BY7), employs three tuned circuits, all ganged to the main tuning drive. One of these is on the aerial side of the EF85 and the other two in the r.f. transformer coupling between the r.f. stage and the frequency changer. The circuit Q values quoted are between 100 and 150 which, together with the 1·6 Mc/s i.f., ensure an i.f. image rejection of between 60db on the h.f. bands and 85db on 80m. Care was taken in the design to arrange for an even amount of amplification on all bands, so that the S meter readings would be true, provided that the r.f. gain was turned to maximum.

The ECC81 (12AT7) additive frequency changer comes next, from which the first i.f. of 1·6 Mc/s is obtained. A 150C2 (OA2) provides for the stabilization of the anode voltage for both the mixer and the oscillator sections. One problem that should be mentioned at this point is that of drift. Obviously the slightest amount of drift will be noticed on a receiver with such considerable band spreading as the RX60. Completely effective temperature compensation in the frequency changer would have been possible, but would have necessitated each receiver being treated specially in the factory, leading of course to a not inconsiderable increase in price, which was the one thing the designers wanted to avoid. More general measures were therefore adopted; for example the use of v.h.f. type cores in the coils and a fixed amount of temperature compensation, namely a TC of +100. The drift figures quoted by the manufacturers lie between 2 kc/s on 80m and 25 kc/s on 10m. In the author's experience, however, the drift on the h.f. bands exceeds these figures, but more will be said about this in the section describing the RX60 in actual operation. As will be seen from the circuit diagram, electrical frequency correction is provided with a circuit arrangement employing an OA161 diode. The frequency correction control itself is on the right of the front panel, just below the S meter, and enables any drift during the warm-up period to be compensated for. The circuit arrangement is shown in Fig. 4.

Following on the first frequency changer comes a stage of i.f. amplification with an EF89 (6DA6) and then the second frequency changer, for which an ECH81 (6AJ8) is used. Here the mixer is crystal controlled, and the output is taken straight to the triple crystal filter, already described. After the filter is a stage of i.f. amplification on 460 kc/s, transformer coupled to the two OA161 germanium diodes used for the demodulation of the signal and for the a.v.c. This part of the circuit is perfectly straightforward and employs the same techniques to be found in any standard communications receiver. The a.v.c. is effective in the usual way

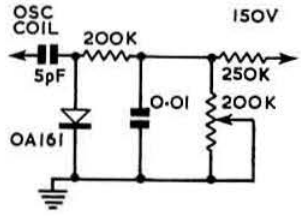


Fig. 4. Electrical frequency correction arrangement in the RX60.

on the i.f. and r.f. stages, and switching from " manual " to " a.v.c." also automatically switches in the S meter.

The rectified a.f. signal is fed to the noise limiter, consisting of an ECC83 (12AX7) and an EAA91 (6AL5). It can be so adjusted with the limiter control that any noise below a certain " threshold " value will not appear at the output of the receiver. A signal that is above this threshold level will, however, open the receiver and will be heard. From here the signal goes on to the a.f. amplifier employing an EF89 and an EL84 (6BQ5). The reason given for the choice of such a high degree of a.f. amplification (the

EL84 can deliver up to 5 watts to the loudspeaker) was that many operators, especially on c.w., prefer to operate a receiver with as little r.f. and i.f. gain as possible but with the a.f. gain turned well up. The author feels that another reason may have been to cater for the demands of the large numbers of German amateurs who spend most of their time working on 80m phone and who prefer a loudspeaker to a pair of headphones. Experience has shown that, when working with headphones, the a.f. gain control has to be turned well down for comfort.

A part of the output stage that is of particular interest is the so-called " a.f. selector," which achieves the same effect as a " select-o-ject " in the " select " position. By means of the two controls, " amplitude " and " frequency," selected audio frequencies can be given a lift of up to 20db. This device is obviously intended in the first place for the reception of c.w. signals but it also works very well when listening to phone stations if, for example, it is desired to accentuate the higher a.f. frequencies of the modulation of the station being received or if, for reasons of high interference, a fairly narrow bandwidth position is being used. The circuit is as follows: part of the a.f. output voltage on the secondary side of the output transformer, which has an impedance of 5 ohms, is fed back via a Wien bridge arrangement to the grid of the a.f. pre-amplifier. The bridge acts as a bandpass device, determining the frequency and the amplitude of the lift of the selected frequency. In order to prevent any feedback of the frequency " lifted " in this way back into the limiter circuit, a decoupling resistor is provided between the volume take-off on the volume control and the control grid of the EF89. This completes the description of the a.f. section of the receiver, except for the provision that is made for making tape recordings of QSOs. The socket for this is at the rear of the receiver and the audio is taken off just in front of the volume control.

Mention has still to be made of the b.f.o. which is placed, rather unconventionally, at the front of the receiver before any i.f. amplification has taken place. There are two reasons for this. One is that the lower signal voltages met here, on being heterodyned with the b.f.o. signal, give a much cleaner beat note, and there is not nearly so much danger of " swamping " taking place as on the output side of the i.f. amplifier where voltages of anything up to 10 volts may be encountered. The second reason is, however, the more interesting: there are two b.f.o. controls, " frequency " (or pitch) and " amplitude " for c.w. operation. Reception of telephony is possible simply by turning down the amplitude control until the beat note disappears. A separate " c.w./phone " switch is also fitted; on switching to the phone position the b.f.o. acts as an " absorber," that is to say like a *Q* multiplier in the rejection notch position. Depending on the position of the " amplitude " control, a rejection notch can be placed on an interfering signal present on one of the sidebands of the station it is desired to receive. In this way interference with a bandwidth of up to 800 c/s can be rejected up to a depth of over 20db. This arrangement works in the following way: the coupling between the primary and the secondary of the first i.f. transformer is by means of a coax cable, into which a coupling coil to the b.f.o. is introduced. With the switch in the " c.w." position this last-mentioned coupling coil is switched out, and the beat signal from the b.f.o. is coupled capacitively, its amplitude and pitch being adjusted in the normal way. In the " phone " position, on the other hand, the coupling coil becomes effective and behaves like a series resistance in the coax lead. With the " amplitude " control at minimum there is no attenuation of importance and the series resistance mentioned above is very small. On turning the " amplitude " control up, the series resistance gradually increases and the interfering signal is attenuated in the same ratio and with a bandwidth determined by the b.f.o. circuit.

The power pack is quite conventional, the only point of note here being that the designer, with an admirable understanding of amateur mentality, has provided the power supply with enough reserve for an additional three valves. In this way a converter (for example for 144 Mc/s) can be run off the power supply of the RX60 without any danger of overloading any of the components.

Mention has already been made of the 100 kc/s oscillator and of the fact that it can be delivered separately, together with the relevant 10 pin socket. The valve used is an EC92 (6AB4) and it is supplied calibrated in the receiver to an accuracy of better than ± 2 c/s. The harmonics of the fundamental 100 kc/s signal are fed direct into the r.f. stage and on turning the r.f. gain up sufficiently can be heard clearly all the way up to 30 Mc/s. The accuracy of the oscillator enables it to be used as the station frequency standard and also simplifies the frequency correction necessary during the warming up period. It is switched in and out by means of a push/pull switch combined with the limiter knob. Other points of interest not yet mentioned are that the dial drive has a ratio of approximately 80 : 1, that the dial illumination can be switched off, that the sensitivity is quoted as better than 0·5 μV for 1 watt audio and the signal to noise ratio as better than 20db at 1 μV. A switch " Transmit/Receive " is also incorporated. In the " Transmit " position, the h.t. to the r.f. and the i.f. stages is cut off, and provision is made for a relay contained in the transmitter to be activated. The necessary socket is fitted to the back of the RX60, and enough current is fed to the transmitter to operate a relay with a d.c. resistance as low as 30 ohms.

The mains input can be adjusted at the mains transformer for any voltage between 110-150 volts and 205-245 volts, 50-60 c/s, in 5 volt steps. A black panel above the dial is for the call-sign of the owner, the call-sign being inscribed on the panel free of charge by the makers. In addition to the loudspeaker connection at the rear of the set, two connections are provided at the front for headphones, to the left and the right underneath the handles. (It can here be seen that the jack plug, so common in England, is practically unknown on German-made equipment.)

The cabinet is of heavy-duty steel, finished in grey crackle, and the dimensions are approximately 21·5 in. long, 10 in. high and 11 in. deep. The weight is about 42·5 lb. and the mains consumption 100 watts. The factory will also, at no additional cost, undertake to supply the RX60 in a special version for blind amateurs, with the dial calibration and dial pointer so designed that they can be " read " by touch.

The RX60 in Operation

It should be mentioned that normal operation from DJ0BF is c.w. only, employing break-in. Nevertheless, some considerable time has also been spent for educational purposes listening to phone QSOs and tuning in to s.s.b. stations. Quite obviously, some time must be spent " getting to know " the receiver and learning how to manipulate the various controls to the best advantage. After the first few evenings of operation considerable efficiency was attained, and the set made an even more favourable impression than in the first half-hour that it was switched on. The RX60 works very well when operating break-in, the " recovery " time being rapid enough to listen between dots. A certain amount of inconvenience due to the transmitter overloading the receiver has been experienced, but this is a drawback common to almost all communications receivers and is not limited to the RX60 alone.

The drift already mentioned is quoted by the manufacturers as being between 2 kc/s on 80m and 25 kc/s on 10m, but with the author's receiver is in fact approximately 10 kc/s on the l.f. bands while on 15m there is a drift of about 40 kc/s in the first 15 minutes of warming-up. This is due to the fact that the 15m oscillator coil is positioned too near to the ECC81 mixer/oscillator valve and is in consequence subjected

to an excessive amount of heat during operation. After this, the receiver settles down to a reasonable amount of drift. During the warming-up period the calibration can be corrected on all bands with the frequency correction control, but even so a certain amount of care is necessary in the first one to two hours of operation during QSOs, especially if the crystal filter is in its narrowest position, and some retuning is then necessary at the beginning of each over. After about two hours only occasionally does one then have to make any corrections with the tuning control. This drift is the only really black mark that the author gives the RX60.

Since writing this article, the author has had occasion to operate a later RX60 owned by a German amateur. With this model the amount of drift was noticeably less, which would mean either that improvements have since been carried out to the mixer/oscillator section or that the author's RX60 has wider oscillator capacitance tolerances than later ones.

The crystal filter, which for c.w. reception is left permanently in the " narrow " position, is most effective with the only limitation that, in the event of a QSO with a station with an S3-4 signal, there is not much that the filter can do with an S9 signal that suddenly appears 1 kc/s away. The " A.F. Selector " is also the most useful for giving the received signal that little extra " boost." Standard operating procedure at the author's station is to turn the crystal filter to " narrow," set the b.f.o. " amplitude " control to the middle of its range, select a tone either to the left or to the right of the centre position with the b.f.o. " pitch " control and then adjust the two a.f. selector " frequency " and " amplitude " controls until a definite " lift " of the signal is perceptible. All the controls thus set are then left, with the exception of the b.f.o. " pitch." As the b.f.o. operates on the relatively high frequency of 1·6 Mc/s, it has a tendency to " wander " a little in the first half-hour, necessitating some slight readjustment in this period. After half an hour the b.f.o. frequency remains perfectly constant.

There are three gain controls: r.f., i.f. and a.f. On s.s.b. the b.f.o. " pitch " control is set either to the left or to the right, depending on which sideband is being transmitted, and the signal then tuned in with the main tuning knob. Much can be achieved by adjusting the b.f.o. " amplitude " control, thus regulating the strength of the " carrier " added in the receiver.

For the reception of a.m. stations either the " c.w./phone " switch is left in the " c.w." position and the b.f.o. " amplitude " control backed down until no further beat note is heard, or the " phone " position is employed. Here the two b.f.o. controls can be used to obtain the " absorber " effect already mentioned. The " wide " position of the crystal filter (4·5 kc/s) is used, or in the event of QRM the bandwidth can be narrowed down to 2·5-3 kc/s without loss of intelligibility. In the a.v.c. position the S meter also comes into operation, as already explained.

Conclusion

This article has tried to show how a national amateur radio organization has managed to produce a receiver for as low a price as possible in order to meet a specific demand for this particular piece of amateur equipment. Some American amateur band receivers possibly have a far better performance—the great advantage of the RX60, however, lies simply in the fact that a receiver that more than satisfies the needs of the average German amateur can be supplied to him at a price that has been made possible only by direct co-operation between factory and amateur. In conclusion, the author would like to express his thanks both to Herr Georg Paffrath (DL6EG) and to Max Funke, Adenau, for their help and for permission to publish the photograph and diagrams.

807 *v.* 6146

By F. G. RAYER (G3OGR)*

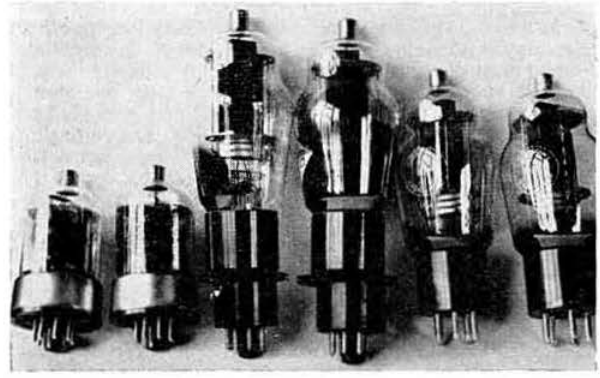
LISTENING on 80m reveals that some operators using 807s seem to look forward to the day when they can replace them by 6146s. It was therefore decided to try to make a comparison—admittedly always a dangerous thing to do.

The makers' data showed that both types had full ratings up to 60 Mc/s and that the 6146 was about 1 per cent more efficient. The 807 needs 0·9 amp. for its heater against 1·25 amp. for the 6146, and requires about 3·5 mA drive compared with about 2·8 mA for the 6146. The 807 can take 250 volts on its screen but was found to work well with 150 volts. A decision was made to try a pair of 807s in a transmitter designed for 6146s in which the little additional grid current was easily obtained.

The 6146 is about 3¾ in. × 1¾ in. overall and the 807 about 5½ in. × 2¼ in. To permit quick changing, two adaptors were made for plugging the 807s into the 6146 positions. UX holders were fitted to octal plugs from scrap valves. Fortunately the grid lead passed straight from holder tag to base pin, and was quite short. The adaptors increased the overall height to about 6½ in.—the photo gives an idea of relative sizes of 6146s, 807s with adaptors and 807s alone.

With 600 volts on the anodes and 150 volts on the screens, it was found easy to load the 807s to 120 watts input, the same input used with the 6146s. An appropriate load and meter were employed to check r.f. output and no practical difference could be found between the two types. Replacing the 6146s by the 807s during a contact never brought a deteriorated report. Eventually, the 807s were preferred because their off-resonance current never reached the high value of the 6146s (no doubt partly due to the screen voltage).

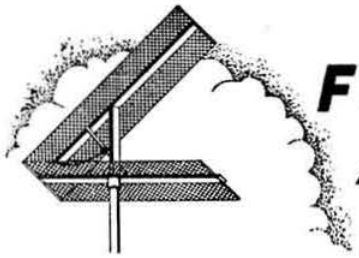
It is not the purpose of these notes to prove that the 807 is better than the 6146 but to suggest that the 807 can stand comparison. Those used cost 15s. a pair, while the cost of two 6146s is a very different matter. It may be worth noting that W3HH is reported to have operated a single 807 at over 90 watts input with no apparent ill effects (*QST*, October 1958). A pair of 807s should thus do well for 150 watts.



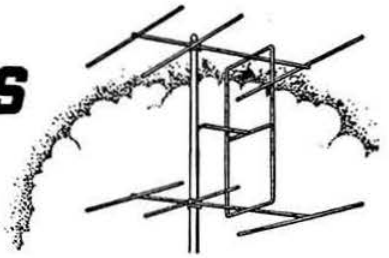
From left to right, pairs of 6146s, 807s with adaptors and 807s.

It might be even more unwise to try to make a comparison between a pair of 807s and an 813. In any event, the different operating voltages make this difficult. Certainly the 807 seems to be very far from obsolete.

* *Reddings, Longdon Heath, Upton-on-Severn, Worcester.*



FOUR METRES AND DOWN



Great Opening on 144 and 430 Mc/s

By F. G. LAMBETH (G2AIW)*

ONE of the longest v.h.f./u.h.f. openings started on August 28, 1961, and was showing signs of fading out by the end of the Region I I.A.R.U. V.H.F. Contest on September 3. The opening was the result of a large anti-cyclone moving out from the continent over the North Sea, resulting in the formation of ducts which gave rise to signals of exceptional strength on both 144 and 430 Mc/s.

Among the many notable contacts during this period was the first G-PA0 2m QSO on RTTY between G3IIR (Forest Hill, London) and PA0FB (near The Hague) with solid copy both ways at 22·00 G.M.T. on August 31. PA0FB later had a RTTY contact with G3MCS; the following day he worked G3KMD at 22·00 G.M.T.

Although the 144 Mc/s band first opened on August 28, the following day was not so good but G3LTF worked OZ stations. The Wednesday evening brought better conditions but the climax came on August 31 when, from midday onwards, DL, ON, OZ, PA0 and SM stations were worked. During the evening of the same day OZ signals were as strong as those from local stations in the London area, the band being full of stations from 144 to 146 Mc/s and QRM a real problem. OZ7WA reported hearing British police radio just outside the amateur band. G5MA (Great Bookham) worked a number of GMs on August 31 including GM3BOC/A in Brora, Sutherland. Other contacts during the opening were with stations in Northern Ireland, EI2W, SM6ANR, OZ and ON, plus a great many DLs and PA0s.

On 430 Mc/s SM6ANR reports seven British Isles contacts including one with G3JHM/A (Washington, near Worthing) on August 31, 1961, which may well have set a new European record for the band. SM6ANR also heard a French station but no contact resulted. G3NNG (Harwell) worked SM7BAE on phone. G3EYV (London, W.11), despite a poor v.h.f. QTH, worked ON4HN (S7), G3JWQ (S9), G2FNW and G3LQR/T and heard G3FOQ. G3FP worked ON4HN and G3OSA (Dorset) on 432·06 Mc/s who in turn worked several London stations. G6NF worked G3JWQ, G5LL, G3KPT, SM6ANR, ON4LN, G2FNW, G3LQR/T, PA0WAR, and heard G3FIJ, ON4HN, DL3FR and PA0XS. G3LHA (Coventry) worked three ONs, on August 31 and F8MX, DL3FR, PA0WAR and SM7BAE on September 1.

The 144 Mc/s band was still wide open on the morning of September 1 and many Gs had the unusual experience of before-breakfast QSOs with the continent. SM6BCU running 20 watts and a 3 element Yagi was RST579 at 07·58 G.M.T. in London. G6GN (Bristol) worked " 30 or 40 " DL and OZ stations. Working the DLs was " like shelling peas." The band remained in good shape all day, with OZ and SM stations still being worked until late in the evening, during which the G3HWR/G3LAR expedition station GW3LAR came on the air and was putting a tremendous signal into the Home Counties and continent from Monmouthshire. OZ7IGY on 146 Mc/s was an excellent signal until late in the evening.

Among G3FZL's contacts on 144 Mc/s during the opening were OZ2BH (Linde) who was using a 1 valve converter feeding into a 5 valve superhet and 10 watts to a 5 element Yagi. Signals were RS59+ both ways. SM6APB made his first G contact at 18·42 on September 1 with an RST589 report. G3FRF, located in a block of flats in London, worked DJ6DN, DL3AY, DJ5NO, PA0FHP, PA0KTO, PA0LQ and DL6AH, and logged 40 other DX stations.

G3OSS (Finchley) worked stations in SM, OZ, DL, PA0, ON4, F, EI2W and heard GI3FJA while G3AAZ (Welwyn) worked OZ, DL, DJ, ON, F and PA. G3HS Faringdon) worked about 14 SMs. G6OX (Englefield Green) had ten contacts with DJs in a row. G6JP (Pinner) worked DL6 and ON4 stations and heard SM and OZ. G3LTN (Weyhill) worked OZ4KO, many DL and PA0 stations and heard SM7ASM. He worked six PA0s and DLs before breakfast on September 1! EA3EP is reported to have been worked by an ON4 and continental stations were heard calling CT1PP.

SM6PU reported that there was an auroral opening on August 30 when he worked SM3, SM5 and DM. SM6PU has a new array comprising four 10 element Yagis at 70 ft.

G2HIF worked SM6ANR on c.w. who was S9 on phone on 430 Mc/s. GW3ATM is also believed to have worked an SM on that band.

Conditions were still excellent during the Contest on September 2-3 and activity was at an exceptionally high level, both in the British Isles and on the continent. A very large proportion of the stations were operating portable. Many British stations ran up good scores and it is hoped that all those active will be sending entries to G2AIW if they have not yet done so.

It has been reported that a PA0 station worked an EA but this has not yet been confirmed.

NORTHERN V.H.F. CONVENTION
Grosvenor Hotel, Deansgate, Manchester
SATURDAY, OCTOBER 14, 1961

The Convention will commence at 2 p.m. and will include exhibition stands, demonstrations, a large raffle and a 144 Mc/s station. The Dinner will commence at 7 p.m. Tickets, price 17s. 6d. each, may be obtained from T. H. Davidson (G3AGS), 101 Grange Drive, Blackley, Manchester 9. Telephone bookings may be made by contacting F. Nichols (G3MAX) at Blackfriars 2946 (day) and Rusholme 1730 (evening). Further information may be obtained from G3AKX, G3AOS, G3EGK, G3KCB, G3LEE and G8SB.

Organized by the North West V.H.F. Group

* *R.S.G.B. V.H.F. Manager. 21 Bridge Way, Whitton, Twickenham, Middlesex.*

Just after the contest ended on September 3, G3FZL worked DJ3FG/P (40 km south west of Hanover) whose second operator was DJ5FV. The latter will be in London from October 1-6 and will be attending the London U.H.F. Group meeting on October 5. He also hopes to visit several v.h.f. stations in the London area.

Individual reports on this great opening to augment this somewhat sketchy review will be much appreciated and should reach G2AIW by September 20.

North-West V.H.F. Convention

It looks as though the North-West V.H.F. Convention, arranged for October 14, is to have a very interesting programme indeed. The organisers have received permission for two parties of approximately 30 persons each to visit the Jodrell Bank Observatory, and buses will be provided, starting from the Grosvenor Hotel, Manchester. A small charge will be made to cover transport. The visits will be arranged on a first come, first served basis, and will be timed to depart at 2.30 and 3.30 p.m. At the hotel, there will be a showing of the sound film *The Inquisitive Giant* which describes the construction of the Jodrell Bank Radio Telescope, for those who cannot visit the Observatory. This runs for about half an hour and will be followed by a lecture by G3BAK on aerial arrays, with a demonstration of scaled down aerials. This programme should be very rewarding, and we advise all those who can to take full advantage of it.

The chair at the dinner will be taken by A. J. E. Forsyth, O.B.E. (G6FO), Editor of the *Short Wave Magazine*.

Members of the R.S.G.B. V.H.F. Committee attending the Convention include Ray Hills (G3HRH), Geoff Stone (G3FZL), Bert Allen (G2UJ) and Frank Green (G3GMY).

Meteor Scatter

G3HBW had a 55 minute QSO with SM5AAS (near Stockholm) at about 900 miles, on August 12 during the Perseids shower. The report received was S2/8 and the outward report was S2/6. An effort to work HG5KBP was so nearly successful that it must have been very frustrating! On August 11 at 22.00 G.M.T. the HG was heard giving reports (S2/5) but no call-sign; he was heard again at RS2/5 Saturday night at 22.00 G.M.T. (when there was a long burst of about 1½ minutes) but still no call-signs. Sunday and Monday brought pings and short bursts but nothing conclusive was achieved. HG5KBP is located at Janoshegy, Budapest. Better luck next time!

G3LTF (Galleywood) had a very good time during the Perseids. Before that there were tests with SM5AAS on July 29-30; this shower was quite good and many pings brought nearly all the necessary signals for a QSO, but not quite! This was remedied during the Perseids, when 14 skeds were run with five different stations—OE3SE, OK2BDO, OH1NL, SM3AKW and SM5AAS. Of these, OK2BDO was worked on August 11 between 21.00-24.00 G.M.T. SM5AAS was worked on August 12 between 06.35-08.00 and on August 13 SM3AKW between 05.00/08.00. This one is G3LTF's own record at 975 miles. In addition, both call-signs were heard from OE3SE and OH1NL, but it is not thought that they heard G3LTF, whose biggest asset is a new crystal calibrator with transistorized standard which can be left on continuously and enables him to measure frequencies within ± 200 cycles. Many other bursts were noted, especially on OK2BDO and SM3AKW. One from the OK lasted 70 seconds while a burst of about 35 seconds was copied from SM3AKW; both contained all the information required including the " R." OE3SE was heard on s.s.b. quite strongly at about S7. On August 10, OK2BDO produced 53 pings and bursts and on August 11, 80.

Moon Bounce Experiments

K1HMU (Farmington, Conn.) is busily engaged on moon bounce experiments on 2m and is using a new aerial based on investigation in *Antennas* by John Kraus (W8JK). When completed, the aerial will have 176 elements and an estimated 26db gain. It consists of crossed Yagis fed in phase quadrature, i.e. two sets of Yagi elements mounted on the same boom, one set vertical and the other horizontal. G3CCH, who sent this information, asks if anyone has a copy of *Antennas* he can borrow. It would be gratefully received, and return guaranteed.

G4LX's Auroral Report

June was a poor month for auroral propagation. There were no signs in the British Isles, and in Sweden only slight traces were observed on June 6, 15, 18, 21 and 22. However, on June 21, SM6PU managed to work SM6CSO/6 and SM7ZN around 23.00 G.M.T.

July proved the opposite. On 12 days during the month, auroral signals were heard in Sweden. On July 4, SM6PU had QSOs with SM3AKW, SM4XA, SM4CDO and SM5AAS/5, hearing several other SMs. Aurora returned on July 5 and 6, but not sufficient to produce 2m QSOs. A long spell started about 16.30 G.M.T. on July 13, contacts being made between SM6PU and SM3AKW, SM3WB, SM4AMM SM4CDO and SM5BSZ. On July 14, SM6PU worked DL1RX, DJ5HG, the usual SM stations and heard (among others) DJ2EEP. On July 15, no QSOs were effected though aurora was still strong up to 100 Mc/s. The next intense activity started on July 17, with several SM stations heard, and this lasted through to July 18 when DL1RX and DJ5HG were again worked. In England on July 18, G3JYP in Westmorland had contacts with G2CIW, G3HAZ, G3HBW, G3NBQ and GI3GXP. A GM was heard but not definitely identified. He may have been GM3BCD. On July 21 one QSO was made in Sweden; on July 23 strong auroral signals appeared as high as 100 Mc/s; on July 26 one SM QSO was made, and the month finished with auroral signals just touching 144 Mc/s on July 27.

G3MTI (Gt. Malvern) reports that only a.m. auroral signals were heard there on July 18, but GW3LJP heard four c.w. stations at 55A.

Two Metre News and Views

EI2W (Dublin), having completed the construction of the new shack in the Dublin mountains, was due to be on the air again from August 28, 1961. The new QTH is 1,000 ft. above sea level with excellent propagation possibilities to the north, north-east, east, south-east and south.

The 2m aerial is of a new design with a measured gain of 15db and it is expected that the frequencies used will be 144·18 and 145·45 Mc/s.

As the mountain QTH is only a few miles from home EI2W hopes to be on regularly. Operation is also possible from 09.00 to 13.00 for DX stations wishing to obtain test signals during periods of good propagation.

G3OSS/P/M reports a very interesting DXpedition from July 13/29 covering the counties of Hereford, Monmouth, Brecknock, Montgomery, Denbigh, Flint, Westmorland, Lanark, Dumfries, Cumberland, Rutland, Huntingdon, Bedford, and Hertford. Many of the contacts in Wales and the North were affected by mountainous terrain, and some of the QSOs were " bounced off the hills "; contact otherwise would sometimes have been impossible. G3JR (London, S.W.13) was worked from Hereford, as well as G3BA/M and G2DCI/M (both with halos at Barr Beacon), GW8NP, GW3MFY and G8MQ (Nottingham). Monmouth brought QSOs with G3HS (Berkshire) and G3GHO (Roade). From Brecknock G6ZP and G3MTI (both in Malvern) were raised, as also were GW3LJP and G5TN by reflection. G2MV was heard testing at 59, but was unobtainable after many calls. On July 16 Herefordshire was again visited and produced contacts with G5JU, G3JZG/M (a terrific signal) and G6GN (Bristol). July 17 in Montgomery brought QSOs with G3GSO (Derbys), G3MNQ (Notts) and the

Malvern stations (round the mountains again). From Denbigh on July 18 G3ILX (Barrow), G6GN and the Malvern stations were all contacted. July 19 from Flint, G6ZP, several Midland stations, and G2HIF (Wantage) were all raised. On July 20, Westmorland was reached, the first day being rather fruitless. Then from Great Dun Fell (2,780 ft.) QSOs were made with G3EHY (59 both ways), G5MA (Gt. Bookham), G3HBW (phone 57) with G3CO heard on phone but not worked. G6AG (Chalfont) and G3JMA (Harlow), G6GN (Bristol), GI3FJA, GW2HIY and G3KEQ (Sanderstead) were among other interesting QSOs. Scotland (Lanarkshire) on the 24th brought a c.w. QSO with G3EHY who was later heard on phone. G5MA, G6AG, G3CCH, G2HIF and GW3GWA were among the DX QSOs. GW6OX/M was worked from Llandudno. A short stay in Dumfries (July 27) gave G3JYP (Westmorland) and GM2FNF (Isle of Arran, Bute). On July 28 mobile operation towards Whitehaven brought a QSO with G3JYP over all the hills, with contact maintained even in Whitehaven. There was a small " rally " near Uppingham, Rutland, on the 29th with G3BA/M and G3ARS/M, and later Huntingdon with a QSO with G3FUR/M. During the journey through Bedfordshire and Hertfordshire G3ILD (Darlington) was heard on the halo whilst G3OSS/M was travelling at 60 m.p.h. A final interesting QSO was with G3JMA when travelling at speed. G3OSS has worked 39 counties and five countries from home in eight months with a Withers TW2 transmitter and a 6BQ7 converter.

G3FNL (late of Upminster) is now near Aldermaston and will be on 2m soon with a 150 watt transmitter.

V.H.F. Band Plans

All v.h.f. operators are reminded of the British Isles Two Metre and Seventy Centimetre Band Plans, which are sponsored by the Society. Observance of these plans will assist in DX working and in avoiding QRM to Service frequencies in the 144-145 Mc/s band.

Zone	2 metres	70 cm.	Area
1	144·0–144·1	432·0–432·1	Cornwall, Devon, Somerset.
2	144·1–144·25	432·1–432·25	Berkshire, Dorest, Hampshire, Wiltshire, Channel Isles.
3	144·25–144·5	432·25–432·5	Brecon, Cardiganshire, Carmarthenshire, Glamorganshire, Gloucestershire, Herefordshire, Monmouthshire, Pembrokeshire, Radnorshire, Worcesterhsire.
4	144·5–144·7	432·5–432·7	Kent, Surrey, Sussex.
5	144·7–145·1	432·7–433·1	Bedfordshire, Buckinghamshire, Essex, Hertfordshire, London, Middlesex.
6	145·1–145·3	433·1–433·3	Cambridgeshire, Huntingdonshire, Leicestershire, Norfolk, Northamptonshire, Oxfordshire, Rutland, Suffolk, Warwickshire.
7	145·3–145·5	433·3–433·5	Anglesey, Caernarvonshire, Cheshire, Denbighshire, Flintshire, Merionethshire, Montgomeryshire, Shropshire, Staffordshire.
8	145·5–145·8	433·5–433·8	Derbyshire, Lancashire, Lincolnshire, Nottinghamshire, Yorkshire.
9	145·8–146	433·8–434	All Scotland, Northern Ireland, Isle of Man, Cumberland, Co. Durham, Northumberland, Westmorland.

Two Metre Band Guard Channels: The following frequencies in the 144-145 Mc/s portion of the 2-metre band are tabulated on the schedule to the Amateur (Sound) Licence to be avoided as they are allocated to Service use: 144·0, 144·09, 144·18, 144·27, 144·36, 144·45, 144·54, 144·63, 144·72, 144·81 and 144·9 Mc/s. *REMEMBER!* THE SAFETY OF AIRCRAFT AND HUMAN LIVES DEPEND UPON THE INTERFERENCE-FREE USE OF THESE CHANNELS.

R.S.G.B. V.H.F. BEACON STATION GB3VHF

The frequency of the Society's v.h.f. beacon transmitter at Wrotham Hill, Kent, when measured by the B.B.C. Frequency Checking Station, was as follows (nominal frequency 144.50 Mc/s):

Date	Time	Error
August 1, 1961	12.01 G.M.T.	484 c/s low
August 8, 1961	12.02 G.M.T.	340 c/s low
August 15, 1961	19.30 G.M.T.	290 c/s low
August 22, 1961	12.41 G.M.T.	220 c/s high
August 29, 1961	12.27 G.M.T.	420 c/s low

The station is in operation from 06.30-23.59 B.S.T. daily but may be on for the full 24 hours for test purposes from time to time.

G3JGJ (near Newton Abbot) sends a welcome report which noted much more activity on 2m this year than last—with a J-Beam 6-over-6 at 50 ft. covering 2m and 70cm. The sked with GC2FZC is still going strong at 17.30 G.M.T. and Sunday mornings at 09.00 G.M.T. G4LU (Oswestry) was recently worked for the first time, whilst G5ML (Leamington Spa) was heard 59 working G5ZT (Plymouth). Altogether, the month of July produced 24 stations on 2m heard and/or worked.

G3JMA (Harlow) says his sked with G3JGJ is going well. A weekly sked with G3ILD seems a " dead cert " RS58 on phone at 21.30 G.M.T. on Fridays. G3ILD's s.s.b. really penetrates at 200 or so miles, since he moved to his new QTH (six miles north of Darlington). G3JMA says his /P trip, to a site near Teignmouth, gave him the great pleasure of providing some of the not so well placed stations in the Home Counties with Devon, and if any of them still want a card, please send one and it will be reciprocated.

G2DHV/M, in his holiday trip to Devon and Dorset, had quite an interesting mixed bag. Using 15 watts to a six element Yagi, he covered, G, GC, GW and F8MX was heard!

G3EMU (Canterbury) had two good dates, July 25 and August 10, with the emphasis on QSOs with PA, for which he seems admirably situated. The most outstanding was PA0LQ/M on a bicycle(!) complete with handlebar halo and p.p. 6AK5 transmitter, and also with PA0ZR who was using a transistor transmitter and receiver. PA0BM and PA0MSH were two other mobiles worked.

G2XV (Cambridge) worked G2DTO/P when the latter was in Cumberland on July 23—this was quite a nice phone signal (and quite a nice QSO! G2AIW).

G3MTI (Gt. Malvern) found G3OSS/P and G2DTO/P centres of interest as they moved around the counties. Previous alerting paid dividends, and with co-operation by G3BA and others many stations pushed up their rare county scores. Best DX from G3MTI was F3LP, and since being mobile in Nottinghamshire and Dorset, only local QSOs have occurred. It was very pleasant to hear G5YV's phone for the " first time ever " when /M in Nottinghamshire. The new mobile rig was quite capable of resolving A3a from G3CCH whilst on the move.

G3CCH (Scunthorpe) had no luck during the Perseids shower, but heard G5YV working OE3SE and G3LTF's QSOs already mentioned. G3CCH is preparing the following skeds.

Saturdays: 20.00 G.M.T.—G3LTF (2m and 70cm), 21.00 G.M.T.—GI3FJA (2m) and 21.30 G.M.T.—GI5AJ (2m). Wednesdays: 05.00-06.00—W1KSI, W1NXY and K1IOE (2m), 06.30 G.M.T.—G3EMU. Thursday evenings —G3EMU. This is to check differences in night and morning propagation—so far the mornings win! Saturdays: 06.00-07.00—OE3SE on s.s.b. (who was heard during the Perseids except for that elusive "R").

G3CCH has heard G5ZT on Hay Tor sometimes by phone, but has not yet had a QSO.

G3JR (Barnes) had a nice QSO on July 20 with G3ILD (Co. Durham) 549 both ways. This gave G3JR his 44th all

time county on 2m. July 25 brought G3OBD/P (Dorset) peaking S8 both ways, and the same evening GW3LJP (Radnor) at RS45/39 both ways. G3JR was amazed to hear G2DTO/P's phone from Merioneth (July 26) and Cardiganshire (28) at RS23/2 and RS33 respectively. If these signals had been keyed QSOs might have resulted.

G3MLE/A (Suffolk) was in great demand on August 9, and was worked among others, by G3JR. GW2HIY has been heard several times at 329 or better, and G3JR is still hoping!

GM3GUI (Friockheim) reports the July 18 aurora which was evident at 16.50 G.M.T. when GM4HR was heard 57A at 17.30, G2CIW was worked 56A, with G3DFL (Staffordshire) worked at 17.55 (55A) and G3HBW heard at 18.25, 56A (beam bearing 030°). Between July 23 and the beginning of August many Gs and GIs were heard, e.g. G3ILD, G3LRP, GI3OFT, GI5AJ, G5MA (calling GM3GUI on July 31). A reply was made, but no QSO resulted. G5MA was later heard 579 working G stations. G3LRP was worked on July 23, and on August 1, G5YV was heard at 569 at 21.12 G.M.T. but no QSO resulted. Nightly skeds on phone with GM3FSD have not failed in 89 contacts, although signals are not always completely R5. The distance is approximately 80 miles. On Monday evenings a fair number of carriers are heard on southerly bearings between 144·5 and 145·8 Mc/s. Scottish stations heard during the period were: GM2FHH, 2DRD, 3BCD, 3DDE, 3EGW, 3FSD, 3DIQ, 3LDU, 3NG, 3KPD, 3LCP, 3LAV, 3HLH/A, 3UM, 3OFY, 4HR, 4QV, 6TF, 6XW.

GM2FHH (Aberdeen) has heard or worked some of the above GMs but has heard nothing else except some evidence of meteor scatter during the Perseids.

By the way, GW3MFY (Bridgend) has the honour of being the first GW winner of the " Four Metres and Down " award. Congratulations, Bill!

Malta, G.C.

It is very pleasant to hear from ZB1A via G2BVN that after trying for a long time to work out of the island on 2m, on two successive Sundays recently ZB1E, ZB1SB, ZB1AJ, and ZB1CA had a five way QSO with IT1BUR on 'phone, with signals S9 or more both ways. IT1BUR was working from high ground in about the centre of Sicily. They are now trying to work an 11 station just south of Naples.

Seventy Centimetres

G5QA (Pinhoe, Exeter) has now worked six counties, Devon, Gloucester, Monmouth, Cambridge, Berkshire, Essex and hopes to have Somerset soon. The sked with GW3ATM (Mondays, Wednesdays and Fridays at 21.15) continues for both this band and 2m on which G5QA is also active again.

G3JMA (Harlow) who is now running 55 watts to an Amperex 5894 p.a. with a 40 element stack at 50 ft., worked 32 stations in the Second 420 Mc/s Open Contest on July 16. The best DX was G3JWQ/P near Buxton, with G3BA, G3HAZ/P, G2CIW and G3LHA in and around Birmingham all worthy of mention as was G3JHM/A (near Worthing). There was great enthusiasm and high activity. G5QA (Exeter) was worked on August 9 for a new county (total now 21), as was G3OAT/T (Hunts.) who was caught just before moving to Lincolnshire. G3KMP (Hastings) was a first on August 8, with ON4HN's carrier received S4/5 for a period of more than three hours on August 10 (and he never appeared to tune the band!) It is thought he must be testing his new 4X150A p.a. Activity on 70cm has improved recently and two or three stations at least can be heard most evenings, and even on Sunday afternoons. G3JMA's receiver is an A.2521 r.f. stage ahead of a G3BKQ-type converter into an HRO. His frequency is 434·39 Mc/s.

EI2W (Dublin) is available on 433·8 Mc/s with a 32 element beam, from the Dublin Mountains (1,000 ft. a.s.l.)

G3EMU (Canterbury) has had 70cm gear for a few years, but had not used it as there was no local activity within range. However, when in QSO with PA0KT recently on 2m the suggestion was made to try 70cm; so the gear was dusted off and much to everyone's surprise PA0KT was tuned in at S8 just as easily as on 2m. G3KMP has since been worked cross-band and G3EMU will be pleased to listen for any interested station.

G2XV (Cambridge) heard G5QA calling G3JMA on August 14. Since Herb. normally only runs about 9 watts on this band, plus the fact that conditions at that time were not of the best, he seems to have been doing a pretty good job for about 200 miles! G2XV would like to see a list of *active* 70cm stations with frequencies; we thought that the list in the July BULLETIN was just that—however, if the active stations will oblige, we will certainly try again.

G3LTF had several QSOs with G2CIW between July 18 and August 15.

Four Metre Activities

After a considerable spell of trouble shooting and " debugging " GI3HXV is on 4m, running 30 watts input to a modified SCR522 (frequency 70·26 Mc/s) and a 3 element rotatable beam at 25 ft. He is particularly looking for QSOs with some Midland Gs who are asked to turn their beams North Westward.

G3HWR (Hampstead) is now back on 4 and looking for QSOs. Operation is mainly on Sunday mornings (frequency 70·32 Mc/s).

Derby Mobile Rally

THE weather for the weekend of festivities celebrating the 50th anniversary of the Derby Wireless Club was very unsettled; however, attendance on the Saturday evening, for the dance and barbecue at the Rykneld Schools, totalled some 200 visitors and friends. On the Saturday afternoon, 24 mobiles signed in plus 47 other licensed visitors.

Sunday proved to be no better as regards the rain, which continued until after lunch, but the register showed 428 names at 3.15 p.m. and the park contained 63 mobile equipped vehicles and 231 others, apart from motor cycles. It is estimated that the total number of people on the school premises and grounds at 5.30 p.m. was over 2,000.

The Mobile Treasure Hunt was not well supported, there being only eight entries. The Treasure Hunt winner was G3GEW who received a Goodmans Axiom Speaker. The mobile competition, judged by F. K. Parker (G3FUR), R.S.G.B. Zonal Representative, and D. Tannock (GM2BUD), was won by G6SN (v.h.f. section) and G2ADR (l.f. section). Prizes for this event were a transistorized bridge and a signal generator. The XYL of G3BJR was the recipient of a pressure cooker for her excellent effort in the Ladies' Obstacle Race and SWL W. Faulkner received an electric razor as the winner of the Men's Obstacle Race.

A pair of OC19 transistors was presented to G3GRF for the estimating contest, while in the raffle the first prize of a refrigerator went to G3IMP, the second prize (a vacuum cleaner) to GM3KJF and the third prize (a tape recorder) to SWL H. Stratton. The remaining 40 prizes went to a wide variety of licensed amateurs and guests.

Prizes were presented by the President's wife, Mrs. A. G. G. Melville, after the President had proposed a vote of thanks to the Organizing Committee for an excellent week-end's entertainment.

A programme prize for No. 163 has yet to be claimed and may be obtained on surrender of the programme to the organizer, Tom Darn (G3FGY), 44 Laurel Avenue, Ripley, Derbyshire.

LONDON U.H.F. GROUP

will meet at the Whitehall Hotel, Bloomsbury Square, London W.C.1.

at 7.30 p.m. on Thursday, October 5, 1961.

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

THE MONTH ON THE AIR

A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By R. F. STEVENS (G2BVN)*

CONDITIONS during the past month on the h.f. bands have again varied between excellent and appalling but on the majority of days there has been worthwhile DX activity. The 7 Mc/s band is showing signs of improvement and the period between 20.00 and 08.00 has produced some interesting contacts. In so far as 14 and 21 Mc/s are concerned, the former has contained some excellent signals from the Pacific during the mornings, and the strength of these, and the length of time during which they have been audible, are reminiscent of the palmier days of the sunspot cycle. On the other hand, 28 Mc/s is sadly neglected these days but often produces good signals from the African continent during the early afternoons, not a particularly convenient time it must be admitted. The suggestion that this band be used for local contacts thus relieving the lower frequencies (first made in the BULLETIN some months ago) recently found an echo in the *Short Wave Magazine*, and it is hoped that all operators will act on this idea. Other considerations apart, the light occupancy of an amateur band is duly noted by those interests who will be demanding additional frequencies at the next international conference.

The DX Century Club race shows no sign of abating and the current Honour Roll lists W3GHD, W4DQH, W3JNN and PY2CK, all on the 311 mark, with the last mentioned leading the world with 311 countries on 'phone only. Foremost amongst the U.K. stations are G4CP and G3AMM with 300, with G2PL and G5VT clocking 270 and 268 respectively on 'phone. On sideband the latest listing in *CQ* shows TI2HP (239) and W6UOU (231) in the lead, whilst from the Commonwealth VQ4ERR (218) and MP4BBW (192) take pride of place.

In the sideband feature in August *CQ* the joint editors, K2HEA and K2MGE, provide much food for thought under the heading " Time for a change," and castigate the bad manners and habits of a large number of sideband operators, and say that members of recent DXpeditions have preferred c.w. operation in view of the superior capability and better manners displayed by the c.w. stations. It would indeed be a pity if s.s.b. with all its advantages were to fall into disrepute due to poor operating.

News from Overseas

VR3L, the station of the R.A.F. Amateur Radio Club on **Christmas Island,** have acquired a new transmitter, a Viking Ranger, and are looking for U.K. contacts between 06.45 and 07.15 around 14·1 Mc/s. On at least two occasions recently the signals from VR3L have peaked to 5 and 7, and amongst the stations worked was VS9MB, the club station at R.A.F. Gan. (G3DAF).

5N2JKO has been fairly inactive since his return from leave in December last but is acquiring an Eddystone 888A as companion to his KW Vanguard transmitter. Mike is erecting a 260 ft. wire aerial and hopes to have a beam up before too long, and also mentions the advent of television into Nigeria, where a pilot transmitter w ill commence operation on March 13, 1962. It is to be hoped that the coming of the one-eyed monster will not curtail operating from Nigeria. The first YL from this part of the world is now on the air under the call **5N2DMS,** which has been allotted to Mrs. Doris Murray-Stone, and who has been heard operating the OM's potent rig.

ZK1BO is the call used by the Rarotonga Young Men's Club, who operate the local broadcasting station (ZK1ZA) on reduced power on the amateur bands. Sending this information, B.R.S.22299 quotes ZK's 1AK, 1AR, 1AY and 1BS as being active from the Cook Islands. It is known that ZK1AK will shortly be returning to ZL and his excellent c.w. operating will be missing for a time. ZK1BS is now believed to be active on a.m., c.w., s.s.b. and RTTY. Also from the Pacific, **KH6BPF** sends his change of address which will be found in *QTH Corner*, and reminds that he is still the QSL manager for 4S7YL and KC6GJ.

ZB1A, the first licensed station in Malta, is now active on s.s.b. with a KW Viceroy and an MR44, the mode of operation naturally creating a great deal of interest. ZB1A mentions that an attempt is being made to form a branch of the R.N.A.R.S. in Malta and a preliminary meeting was attended by five of the island's amateur population.

VS9AGA is now active, mainly on 21 Mc/s a.m., with a KW Victor and an AR88, and is looking for U.K. contacts between 11.00 and 20.00 VS9AGA mentions that s.s.b. activity from Aden should shortly materialize in the shape of VS9's AAC and APH.

The **Society of Newfoundland Radio Amateurs** plan to hold a week long celebration of the 60th anniversary of Marconi's first transatlantic wireless communication from Poldhu to St. John's. It is planned to have a special station operating

5N2JKO uses a KW Vanguard and hopes soon to have an Eddystone 888A receiver.

** Please send all reports to R.S.G.B. Headquarters to arrive not later than September 20*

on all bands, and VO1AK is at present awaiting word from the Department of Transport authorizing the use of the call VO1MSA.

Further activity from **Cyprus** is available under the call of **ZC4JW**, who has recently commenced operation using a DX40 and an AR88. His address will be found in *QTH Corner*. **ZC4MT**, who is ex-5A1TY, is now on the air, mainly on 21 Mc/s a.m., with excursions to 14 and 28 Mc/s. All cards from 5A1TY have been despatched, but so far have only yielded a 20 per cent. return All incoming cards should be sent to the address in *QTH Corner*.

5N2JM, who is now in the U.K., will shortly be proceeding on a six month assignment to Mauritius where he hopes to be able to operate on 7, 14 and 21 Mc/s. Details of the equipment to be used and the call-sign are not yet available, but will be noted in this column as soon as known. QSLs should continue to be sent to K9EAB, 711 W. McClure Ave., Peoria, Illinois, U.S.A.

5A4TC is the new call of Stan Crabtree (ex-VQ4GQ), who is now on the air after many setbacks, and hopes to be active on all bands.

The amateur radio club at **R.A.F. El Adem** has been inactive recently but will soon renew operation under the call of **5A3CAO**, held by Iain Trays, whose address will be found in *QTH Corner*. A three element beam has been erected and as soon as certain spares arrive the club will be looking for G contacts.

VE3AYE is continuing his campaign for s.s.b. operation by non-W stations in the region 14,120 to 14,140 kc/s, and judging by the greatly increased activity in that part of the band during the evening hours, a large number of operators are in agreement with his ideas. Bob points out that transreceiver operation, i.e. transmitting only on the receiver frequency, is still possible by operation of the segment switching in the popular U.S. equipment, so that one can listen 200 kc/s above the transmitted frequency, i.e. transmit on 14,120 and listen in the U.S. phone sub-band at 14,320 kc/s.

DX, the weekly magazine produced by **W4KVK**, is again in circulation after several setbacks, and the editor hopes that the publishing schedule will now continue uninterrupted. A yearly subscription to *DX* costs $7.50 by first-class mail.

9M2DB, in the course of a recent QSO, mentioned the tremendous amount of interference that the Malayan stations suffer from the traffic handling carried on by operators in the Ryukyu Islands (KR6). This has been so troublesome that many stations in this area have confined their activity to 21 Mc/s, but obviously in a year or two this band will provide fewer openings and they will wish to operate on 14 Mc/s again. Traffic handling has no place on our crowded bands, and there should be some means whereby these stations can be persuaded to use other frequencies.

QTH Corner

BV3HPT	Box 7031, Taipei, Formosa.
CP5EA	via W1BAN.
EA6AZ	via K2VQQ or P.O. Box 303, Palma di Majorca, Balearic Is.
EI9AE	to G3MVV.
GC8KS	to G8KS.
HA9OZ	P.O. Box 12, Miskolc, Hungary.
KC6BH	Amateur Radio KC6BH, Truk, E. Caroline Islands.
KG6AJS	Box 44, Guam.
KH6BPF	1230 Loho St., Kailua, Oahu, Hawaiian Is.
KH6EDY	(Operator Bob); via W5QK.
KJ6BV	via WA6HOH.
KX6DB	Box 1266, Navy P.O. 824, San Francisco, Calif., U.S.A.
LX3QX	via ON4QX, Box 331 Antwerp, Belgium.
OA4DI	P.O. Box 1578, Lima, Peru.
PZ1AY	Box 12, Moengo, Dutch Guiana.
SP0ZHP	via SP5HY.
TU2AF	Box 571, Abidjan, Ivory Coast Republic.
VK0FZ	via W5WW, Box 214, Center, Texas.
VP2AB	J. Brown, P.O. Box 229, Antigua.
VP7NQ	Box 1566, Nassau, Bahama Is. or via K0BLT.
VP8CA	via KH6OR.
VR4CV	Box 49, Honiara, Guadalcanal, Solomon Islands.
VS9AGA	J/T Gostelow, P., Hunter Block, Room 3, Middle Floor, R.A.F., Khormaksar, B.F.P.O. 69.
YU1AD	16, Kataniceva, Belgrade, Yugoslavia.
ZC4CS	C. Scrivens, " A " Watch, 264 Signals Unit, B.F.P.O. 53.
ZC4TX	Amateur Radio Club, R.A.F., Paramali, via Box 219, Limassol.
3A2BZ	via DL9KP.
3A2DA	via HB9AAW.
5A3CAO	Amateur Radio Club, c/o Trent Block, Room 6, Signals Section, R.A.F., El Adem, B.F.P.O. 56.
5N2AAK	A. A. King, Wireless Office, Nigerian Railway Corp., Ebute Metta, Lagos.
5N2BCF	B. C. Fisk, c/o Cable & Wireless, P.O. Box 173, Lagos.
5N2DJA	A. P. J. Mould, P.O. Box 263, Port Harcourt.
5N2EBL	E. B. Lloyd, c/o C. Zard & Co., P.O. Box 114, Ibadan.
5N2JAF	J. A. Fuge, c/o Cable & Wireless, P.O. Box 173, Lagos.
5N2KHK	via W2CTN.
5N2RDG	R. D. Gynn, c/o Cable & Wireless, P.O. Box 173, Lagos.
5R8CE	H. Malgorn, Roguemire, Cleder, Finistere, France.

DXpeditions

G3JFF/VR2EA/VR1M writes from Fiji where he made 183 QSOs during the first weekend of operation as **VR2EA**. The only U.K. station contacted was G3AMM, most of the remainder being W/VE. Mikes hopes to be active from the Gilbert and Ellice Islands beginning September 16, as VR1M, and during October as YJ1MA for at least a fortnight. Conditions to Europe have been very poor, but it is hoped that there will be a change by the time that the VR1M operation takes place. When *H.M.S. Cook*, the vessel on which G3JFF is a Radio Supervisor, arrived at Suva, he was met by VR2AP and within minutes was the owner of the call VR2EA. As mentioned before QSLs from Europe should go via GW3LQP.

ZC4CT will be going to the Persian Gulf area between November 6 and 24, and will be operating as **MP4BDK, 'MAL** and **'TAP.** C.w. operation only is envisaged using a DX40. Colin hopes that ZC4SG and one of the operators from ZC4PC will be available to accompany him.

Following the operation as **LX3QX** and **LX3DX**, the Antwerp C.W. DX Club, led by ON4QX, have plans to make further trips to Monaco and San Marino.

Zone 19 activity is planned for the last week in October when it is hoped that **UA0BP** will be able to make the trip. This is being arranged by the Central Radio Club to fill some of the gaps caused by the failure of UA0LA to reply to the majority of QSLs sent to him. The mode to be principally used will be s.s.b.

UA2OA was using the portable Russian transmitter from Kaliningradsk on the usual crystal controlled frequencies, and the address given in *QTH Corner* for July is correct for direct QSLs. Anly worked over 100 countries and 39 zones during the short period of operation. The missing zone was No. 39. **UA1KED** on **Franz Josef Land** will continue to be active well into 1962, and according to UA3CR, the portable s.s.b. transmitter will be sent there during the early months of next year.

The **R.A.F. Amateur Radio Society** will be mounting a DXpedition to **French Somaliland** under the call **FL8RAF** during the period October 4 to 16. Operation will be on a 24 hours basis using a.m., c.w. and s.s.b. QSLs will be dealt with by G3GJQ, and if reply postage is not enclosed will be sent via the bureaux. The gear will include two KW Viceroys, the S Line, and a Heathkit DX100 with a SB10. The operators will include G3GJQ, G3NAC, G3OLV. VS9AAC, VS9AGA and VS9APH. Calls on the transmitting frequency will not be answered, and the DXpedition station will be listening 10 kc/s up or down from their own frequency.

GM5BK/P was the call used by the **Cheltenham R.S.G.B. Group** on their trip when operation took place from Kincardine, Argyll, Nairn and Kirkcudbright. Practically all the activity took place on 1·8 Mc/s, but the number of QSOs was reduced by indifferent weather, the difficulty of locating good operating sites and the obstinacy of the p.e. generating

set. Many stations were worked from all four counties and G3CGD, and his co-operator G3HCV, mention that the frequent reports of S8 and S9 from S. England made the continuous rain quite bearable.

VK4RZ made an unheralded appearance from **Tonga** where he operated as **VR5RZ,** mostly on 14 Mc/s s.s.b. On several occasions signals were well heard in the U.K. and a number of G QSOs were made. Last instructions on QSLing were that the cards should go to the home QTH.

7G1A operated from the Mali Republic as **7G1A/TZ** during the weekend August 26/28, and cards should be sent via the Czechoslovak Bureau at P.O. Box 69, Prague.

GM3DXJ will be making an appearance on 1·8 Mc/s c.w. during October from the Border counties. This operation will normally be during the Friday and Saturday evening periods. It is hoped to visit East Lothian, Berwick and Roxburgh, but GM3DXJ will be willing to consider suggestions for operation from other counties, which should be sent to 52B Valon Road, Arborfield, Reading, Berks. Cards for the operation from Selkirk have all been sent out through the R.S.G.B. Bureau.

VP5BL/5 will be the call used by the DXpedition to the **Cayman Is.** during the period September 30 to October 4. Operation will be for 24 hours a day, and all bands and all modes will be used. The station will listen for European s.s.b. stations on 14·140 kc/s or thereabouts. QSLs should be sent to W3AYD.

FP8AS on **St. Pierre** will be activated during the last week of September and first week of October. The operators will be W2EQS and DL9KR. All bands will be used with c.w. and s.s.b. as the modes.

Prefixes

The Voltaic Republic has been allotted the prefix **TV8,** and stations in the Comoro Islands will henceforth use **FH8** (As this issue went to press, XT2A in the Voltaic Republic made an appearance). These and other recent amendments appear in the R.S.G.B. Countries List which can be obtained from Headquarters for 6d. or one IRC.

The A.R.R.L. advise that in the fourth, fifth, eighth, ninth and tenth call areas the F.C.C. is now issuing WN call signs to Novices, as it is felt that the WN call more readily identifies a novice rather than does the WV call used in the second and sixth call areas. The present rate of increase in amateur licences is 1,000 per month, and in due course it is possible to envisage a situation where a station is allowed to operate on a rota system for a certain number of days per month!

Contests

A reminder that the **Scandinavian Activity Contest** will be taking place during the weekends September 16/17 (c.w.), and 23/24 ('phone). Details were given in *M.O.T.A.* last month.

The **VK-ZL DX Contest** will take place during the periods 10.00 on September 30, to 10.00 October 1, on telephony, and during the corresponding times on October 7 to October 8 on c.w. The object of this contest is for the world to contact VK and ZL stations and vice versa. There are three main sections, viz: (a) transmitting telephony; (b) transmitting c.w.; (c) Receiving, telephony and c.w. Stations entering for sections (a) and (b) must submit separate logs. The scoring system for stations other than VK or ZL is that one point will be scored for each contact on a specific band with any VK or ZL district. The final score will be derived by multiplying the total contacts on all bands by the total number of VK and ZL districts worked on all bands. There are five ZL districts and 10 VK districts, including the Antarctica areas. Logs must show: date; time in G.M.T.; call-sign of station contacted; band used, serial number sent and serial number received. Each new VK and ZL district should be underlined when contacted and separate logs for each band are required. The serial numbers will consist of five figures for telephony and six figures for c.w., and will be made up of the report plus three figures which may begin with any number between 001 and 100 for the first contact and which will increase by one for each successive contact. Cross band operation is not allowed and only one contact per band is permitted with any one station for scoring purposes. Entries must be postmarked not later than one month after the close of the Contest and should be addressed to W.I.A., Federal Contest Committee, G.P.O. Box 851J, Hobart, Tasmania, who will appreciate any comments from contestants to assist in the compiling of future rules. A full copy of the rules is held by G2BVN who will answer specific queries if accompanied by a s.a.e.

CONTESTS DIARY

September 16-17	- Scandinavian Activity Contest (c.w.)
September 17	- Low Power Field Day (see page 86, August 1961)
September 23-24	- Scandinavian Activity Contest (telephony)
September 30-October 1	- VK-ZL Contest (telephony)
October 7-8	- VK-ZL Contest (c.w.)
October 8	- R.A.E.N. Rally (see page 134)
October 28-29	- CQ WW DX (telephony)
November 11-12	- Second 1·8 Mc/s Contest
November 25-26	- CQ WW DX (c.w.)
December 2-3	- R.S.G.B. 21/28 Mc/s Telephony Contest R.S.G.B. 21/28 Mc/s Telephony Receiving Contest
December 3	- OK DX Contest

**To coincide with dates of I.A.R.U. Region 1 v.h.f. contests.*

Although not a contest, mention is here made of the **Fourth International Jamboree-on-the-Air** of the Boy Scouts movement. This will commence at midnight on October 20 and run until midnight on October 22. The **Mitchum and District Radio Society** will be operating **G3OCT** on the h.f. bands during the Jamboree on behalf of their local Boy Scouts Association.

The **1961 CQ World Wide DX Contest** will be held during the following periods: telephony, 02.00 October 28 to 02.00 October 30; c.w. similar times from November 26 to November 28. Participation from the U.K. during the last contest was poor and it is hoped that many more operators will take part and send in their logs. Log forms will be available from G2BVN in the near future, and details of the rules will be published next month.

The Contests Committee have decided that a multi-operator section will be included in the R.S.G.B. **21/28 Mc/s. Telephony Contest,** but participants in this section will not be eligible for the award of a trophy.

Awards

CQ Magazine have decided on four major changes in connection with the **WPX** awards. Briefly these are: (i) Owing to the risk of losing cards in transit QSLs will no longer be required, although the WPX Committee reserve the right to ask for any or all cards for checking; (ii) The qualifying date has been amended to November 15, 1945; (iii) Prefixes that are changed or become obsolete for some reason will be eliminated from the WPX list in order to keep this as current as possible; (iv) The WPX Honour Roll will be amended to show listings of those stations that have worked prefixes using all modes. Other and smaller changes have been made but details of these are not yet available.

Reprints of the information that has appeared in *CQ*

regarding the **U.S.A.-Counties Award** can be obtained from G2BVN (s.a.e. please). The Record Books are obtainable from *CQ Magazine* and not from K6BX, who is, however, the custodian of this award.

The Polish awards "**W21M**" and "**AC15Z**" have been received after four months by G8PL who reports that they are very well worth having. The W21M award is issued by the Warsaw section of the Polish national society for contacting 16 of the 21 countries lying on the 21st meridian, and the AC15Z by the same organisation for contacting 23 out of 27 named districts in Zone 15.

DX Briefs

BY1PK, mentioned recently in *M.O.T.A.*, was worked by G3MGL at midnight on August 21 on 14,070 kc/s c.w. The signal report to the Chinese station was 559, the latter giving his name as Chen.

ZC4PC, the club station at R.A.F. Pergamos, should be on the air on s.s.b. with an SB10 by the time that this is being read. Other calls that will be heard will be ZC4WD, ZC4CS and our informant ZC4CT.

ZD2KHK/NC logs are now with W2CTN who will respond to incoming cards. For a direct reply please enclose IRC and a self-addressed envelope. (G3DRQ).

VP2KD, David Fergus, formerly of Basseterre, St. Kitts, is believed to be in the U.K., and if this should catch his eye would he please contact G2BVN.

VP9QQ was a recent visitor to R.S.G.B. Headquarters and commented on the lack of U.K. stations heard in Bermuda. Operation from the island during the evening hours is apparently extremely difficult due to strong QRM from the Americas. Practically every station contacted hopes to receive a QSL which for an active station means that considerable expense and time are spent in sending cards. On his return VP9QQ will be particularly looking for contacts with the Midlands, and may be found on 14 and 21 Mc/s c.w.

WA6SXR is the present call of G2FYO (ex-VU2HI) who, now on v.h.f., will shortly be found on 14 Mc/s with a beam and a Californian kilowatt. He will be looking for U.K contacts; the address for QSLs is H. Terraneau, 3951, Sunny Oak Road, Sherman Oaks, Calif., U.S.A.

G3IHP (ex-ZD2IHP) will be shortly proceeding to Sarawak for a three year tour and hopes to be active on 7 and 14 Mc/s.

UW prefixes are now being heard and have caused some confusion, but their employment has been brought about by the allocation of all possible calls in the UA series in the particular U.S.S.R. district. UW9CC, now very active on 14 Mc/s s.s.b., is in Zone 17. A number of the U.S.S.R. countries are now permanently represented on sideband and include: UF6FB, UM8FI and UH8DA, in addition to UR2AR, UQ2AN, UP2CG and UC2AA who have been active on this mode for some time. The *CQ SSB* feature in a recent number of the Russian magazine *Radio* lists upward of 50 stations known to be on s.s.b. The majority of the exciters in use are of the crystal filter type.

DJ2EL would appreciate contacts with London stations for the Worked All London Town award. (G8PL).

Band Reports

The L.F. Bands

A general uplift in DX conditions is noticed by B.R.S. 20317 which augurs well for the coming winter. The **1·8 Mc/s** band offered little however, although on two occasions W1AW was heard from 04.05 to 04.15 on 1,823 kc/s at RST339. **7 Mc/s** produced signals from most parts with the notable exception of Africa. N. American stations were heard as early as 22.15, with the west coast signals fading out about 07.15, with VK and ZL coming in between 05.45 and 06.30. Our reporter mentions that on a number of occasions U.K. stations were heard being called by DX stations, but failed to reply. **KV4CI** was heard at 22.50 calling CQ Europe, with **VP2SH** S6 at 22.58 on 7,015 kc/s. **HK1AAK, CX4IK** and **PY7AGY** were all logged around 23.00 at good strengths. **VK5KO** was heard on several days at 579 around 23.00 on 7,005 working Europeans, whilst **ZLs 3GU, 3GS** and **4FB** were active between 05.45 and 06.30. From Asia, **VS9AAC** was heard at 22.40 on 7,020, with **VU2HS** at the same time on 7,010, and **JA2LC** putting in a 459 signal at 23.00. Coming in at the same time as most of the above stations were the N. Americans at very good strengths. Bill Wilkinson mentions the interpretation of l.f. as Left Foot frequencies owing to the habits of those operators that never listen but only transmit.

DXotic Showcase

Call-sign	kc/s	Mode	G.M.T.	Country
VP2AD	7,012	c.w.	01.05	Antigua
VP2SH	7,015	c.w.	22.58	St. Vincent
YV5AVC	7,030	a.m.	16.30	Venezuela
BV3HPT	14,050	c.w.	18.45	Formosa
FO8AQ	14,094	c.w.	08.23	Oceania
JZ0PH	14,052	c.w.	15.30	Neth. New Guinea
KH6EDY	14,098	c.w.	09.20	Kure Is.
KJ6BV	14,092	c.w.	09.00	Johnston Is.
VK0FZ	14,092	c.w.	07.00	Macquarie Is.
VR3L	14,082	c.w.	07.30	Christmas Is.
VR6CB	14,030	c.w.	07.10	Pitcairn Is.
7G1A/TZ	14,050	c.w.	18.05	Mali Rep.
KC6BH	14,304	s.s.b.	15.01	E. Carolines
VR5RZ	14,124	s.s.b.	06.53	Tonga Is.
ZK2AB	14,130	s.s.b.	07.00	Niue Is.
UA0LL	21,020	c.w.	13.15	Asiatic U.S.S.R. Zone 19
VR2EA	21,020	c.w.	08.05	Fiji Is.
6W8BL	21,041	c.w.	18.05	Senegal Rep.
KG4AO	21,270	a.m.	20.50	Guantanamo Bay
PK2HT	21,170	a.m.	17.00	Indonesia

14 Mc/s

Conditions on this band seem to have been somewhat better than during recent months, and there have been good openings to all parts of the world. The Pacific has been productive, mainly during the early mornings, and **G6XL** reports working **KH6EDY** (08.30), **KJ6BV** (09.35) **VR3L** on several occasions around 07.30, **FO8AQ** (08.15), all on c.w., with **K6CQV/KS6** (07.10) and **VR5RZ** (08.05) on s.s.b. **G8PL** also worked **VR3L** (06.45), with Pitcairn's **VR6CB** (07.10) in addition. There are at least three stations active from the Solomon Islands in the shape of **VR4's CB, CW** and **CV,** of whom only the latter has been reported this month by G8PL between 06.00 and 07.00. VR4BW is reported as a pirate operating from nearby VK9. An unusual one on s.s.b. has been **HM4AQ,** who has been quite active around 16.00 to 17.00, with **KG6IJ** on Iwo Jima also heard around the same time, but mainly at the weekends. On c.w. ZC4CT worked **FK8AT** (22.30) and G8KS QSO'd **FK8AH** (11.00). **BV3HPT** (18.45) was a very welcome signal at **G2FFO,** who reports a swift reply to a QSL sent to the address in *QTH Corner*. Maquarie's **VK0FZ** was worked at 07.00 (14,092), with **BV1US** at 20.00. KH6s and KL7s have been available in quantity between 07.30 and 08.30 and often lingering until 09.00 or later. **VR2EA** (G3JFF) produced some excellent signals between 07.30 and 09.30 (14,020) and it is hoped that such good conditions will prevail during the forthcoming operation from VR1. The weekend of the Asian DX Contest produced a great deal of activity from that area, and the affray received considerable support from the rest of the world. There has not been a great deal to report from the African continent, but 7G1A operating /TZ from the Mali Republic provided many operators with a new country, and as usual the operating was excellent. **VP2VJ** has been very active from the British Virgin Islands, and has been contacted from the U.K. around 22.00 on 14,056 kc/s. **UA1KED** on Franz Josef Land has been reasonably well heard in Europe

(Continued on page 128)

Single Sideband

By G. R. B. THORNLEY (G2DAF) *

PERHAPS the greatest advantage of Amateur Radio as a hobby is the ability to be able to discuss with others the merits or otherwise of various types of equipment, and while doing so to be able to ask questions and listen to the other man's opinion. In the majority of cases, the older and more experienced sideband operators can speak from practical experience, and their advice is sound. However, there are times on the amateur bands when one can hear a newcomer being given totally inaccurate and misleading information. This appears to be particularly so when the subject is that of linear power amplifiers, their adjustment and loading. To some extent this is understandable; quite frankly there is a large amount of confusion and fallacious thinking concerning all aspects of linear power amplifier application. Additionally there is increasing interest in the newer methods now becoming popular—grounded grid and passive grid operation.

Many s.s.b. operators are confused by conflicting advice and would welcome information that is technically sound, not too bogged down with mathematical formulae and written in simple understandable terms. Sounds easy—but in fact this is a most difficult subject for any writer to handle in a way that will be understandable and at the same time will cover all the many and varied technical design and practical application considerations. The writer does not profess to be an expert on linear power amplifiers and is fully aware of the pitfalls he might all too easily fall into. However, the questions are being asked—so here is an attempt to answer them.

R.F. Linear Power Amplifiers

The function of the power amplifier in a s.s.b. transmitter is to raise the power level of the input signal without change, so that the envelope of the output signal is a faithful replica

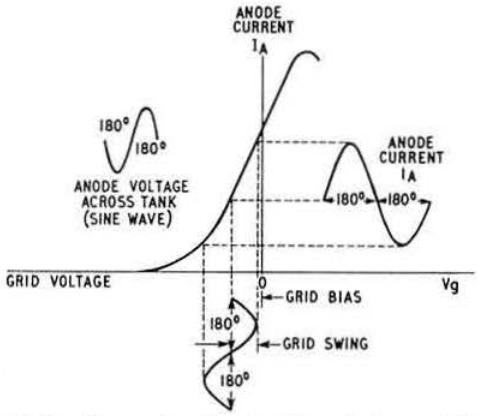


Fig. 1. Class A operation of a valve (dynamic characteristics).

of the envelope of the input signal. A power amplifier that will perform this function is clearly a linear power amplifier.

Radio frequency amplifiers are classified A, B, and C according to the angle of anode current flow—the number of degrees the anode current flows during the 360° r.f. cycle. The class A amplifier has a continuous anode current flow and operates over a small portion of the anode current range of the valve. This amplifier is used for amplification of small signals where low distortion is required. Its efficiency in converting d.c. anode power input into r.f. power output is low, of the order of 30 per cent, but this is not of great importance where small signals are concerned (see Fig. 1).

Class B amplifiers are biased to near anode cut-off so that anode current flows for approximately 180° of the r.f. cycle. Amplifiers operating with more than 180° of anode current flow, but less than 360°, are called class AB amplifiers. Both class AB and class B amplifiers are used in high power linear amplifiers stages to obtain higher efficiency and maximum output power with low distortion. The amplifier

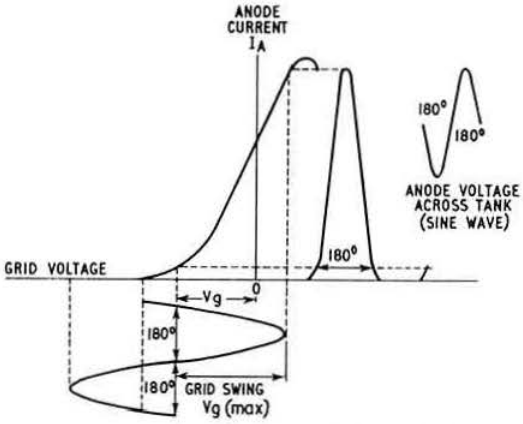


Fig. 2. Class B operation (dynamic characteristics).

efficiency depends on the operating condition selected and the type of valve used and is usually of the order of 50 to 66 per cent (see Fig. 2).

Class C amplifiers are biased well beyond cut-off so that anode current flows for less than 180° of the r.f. cycle. The principal advantage of this mode of operation is high anode efficiency (of the order of 65 to 80 per cent); however, the class C amplifier is not suitable for s.s.b. use because the amplifier is not linear and it will not respond to low level input signals (see Fig. 3). The amplifier class can be followed by a number to indicate whether or not the valve is operated in the positive grid region over part of the r.f. cycle. Class AB1 indicates that the grid never goes positive and that no grid current is drawn; class AB2 indicates that the grid goes positive and that grid current is drawn. Class A amplifiers are nearly always operated without grid current and class C

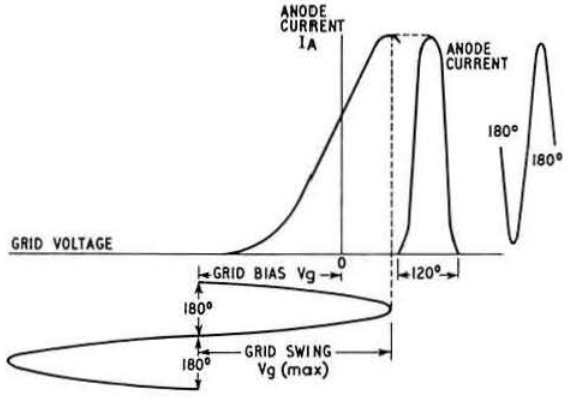


Fig. 3. Class C operation (dynamic characteristics).

* 5 Janice Drive, Fulwood, Preston, Lancashire.

amplifiers are nearly always operated with grid current. It is therefore normal practice to refer to these as class A or class C without the necessity for further designation.

Choice of Valve

There is a wide choice of triode valves suitable for power amplifiers and these have the advantage of simplicity and low cost. Generally, they require a large amount of driving power and because of the considerable grid to anode capacity the valve must be carefully neutralized. The amplification factor of triode valves suitable for amateur s.s.b. application is generally between five for low mu triodes and 75 or more for high mu triodes. Usually only the low and medium mu valves are suitable for the requirements of power amplifiers and it is therefore necessary to provide a large grid swing to obtain the power amplification available from the valve.

With the tetrode valve the screen grid is an electrostatic shield between the grid and the anode and this reduces the grid anode capacity to about one hundredth of that of the triode. It is still necessary to provide neutralization because of the higher amplification of the tetrode valve but the small value of feedback eases the neutralization problem. Additionally, because of the higher gain available, the valve requires a relatively low drive to obtain a high power output.

Pentode construction is also available in power amplifier valves and these give improved efficiency because the r.f. anode swing can be increased. However the pentode is more complex and expensive than the tetrode and requires in some cases additional supply voltage for the suppressor grid. These disadvantages have limited the development of pentode power valves and at the present time the pentode has little advantage over the well designed tetrode.

For linear power amplifier operation the following features are desirable: (i) high gain; (ii) good efficiency; (iii) low grid to anode capacity; (iv) linear characteristics at all frequencies within the desired operating range.

General Considerations

To obtain linear operation r.f. power amplifiers may be operated in class A or class AB. They can be grid driven or cathode driven (grounded grid). The design considerations are extremely stringent to produce maximum linearity and minimum distortion in a given circuit. The valve operating point must be carefully chosen and exactly maintained and the valve must be stable—exactly neutralized—and at all levels of operation the input and output impedances must be held as constant as possible. Normal practice is to use class A pentode power amplifiers in low level power stages to preserve linearity and at the same time produce enough power to drive a higher level stage. In the high level power stages it is customary to use class AB1 or AB2 operation of either triode or tetrode valves to obtain the required power output.

British Sound Recording Association Silver Jubilee Convention

TO mark its Silver Jubilee year the Association has arranged a special whole day Audio Convention to be held at the Institution of Electrical Engineers, commencing at 10 a.m. on Saturday, October 14, 1961.

The programme includes: " Non-linear Distortion Measurement " by J. Somerset Murray, B.A., A.M.I.E.E. " Some Highlights in the History of Sound Recording " by H. A. M. Clark, B.Sc.(Eng.), M.I.E.E. " The Cocktail Party Problem " by Prof. Colin Cherry, D.Sc.(Eng.), A.M.I.E.E. " Studio Acoustics " by C. L. S. Gilford. " Recording and the Artist " by Peter Andry.

Tickets for the Convention may be obtained from the Hon. Secretary S. W. Stevens-Stratten, F.R.S.A., 40 Fairfield Way, Ewell, Surrey.

Registration costs 30s. for non-members, and 20s. for members of the Association.

Following the Convention the Association's Silver Jubilee Dinner will take place at the Howard Hotel, Norfolk Street, London, W.C.2. Tickets for members and guests will cost 30s.

Trip to New York S.S.B. Dinner

A TRIP to New York for the Single Sideband Amateur Radio Association's Annual Dinner at the end of March 1962 is being arranged by G3NUY and G3KGC. The fare for the round trip, which is expected to last four days, will be in the region of £70 depending on the number travelling. A number of U.S. amateurs have offered accommodation for the stay in New York. Those interested in joining the party are asked to write to S. Almond (G3NUY), 265 Longley Lane, Gatley, Cheshire, as soon as possible.

The Month on the Air (Continued from page 126)

between 07.00 and 08.00 (14,056) and some of the operating staff will be remaining until well into 1962. The only a.m. signal that seems to have aroused much interest was that of **MP4TAO** at 20.00 (14,200), although **G3NAC** reports **FG7XE** at 22.30, and **AP2MR** has been worked by European stations around 18.00 (14,180). Generally this band has produced some DX items of interest at most times during the past month, and there has never been a scarcity of new ones, which, having regard to the stage of the sunspot cycle, is indeed heartening, and leads us to anticipate better conditions during the coming winter. Canton Island, never well represented, may now be heard with **KB6BR** active on s.s.b.

The **21 Mc/s** band continues to produce some very good openings almost entirely in a Southerly or Easterly direction. On the former path stations from **TT8, TN8** and **TL8** have been worked on a.m. between 16.00 and 18.00, with **ZD6** (17.00), **5N2** (16.00) and **CR7** (16.30) also logged. The Easterly path has been rewarding and on several mornings **VR2EA** could be contacted around 08.00 to 10.00 on 21,020 c.w. G3NAC reports **VS5GS** and **VS5WS** (17.30), **FB8XX** (12.00), **SL5BA/SU** (16.30), and **4S7s GE, LM** and **YL** (17.00). Zone 19 activity has been noted under the calls of **UA0LL** and **UA0FE** (13.00), with numerous JAs on hand during the Asian contest. An interesting contact for G3AAE was LA7RF/M off the coast of the Solomon Islands, but unfortunately no signals from VR4 have been reported. That there have been openings to the West is proved by KG4AO (20.50), **PJ2CN** (21.10), **HI8DGH** (22.20), **VP3YG** (22.30) and **VP3RW** (20.00). G3NAC reports that the last mentioned is crystal controlled on 21,232 kc/s and is active every night at 20.00, although his stay in British Guiana will be ending in the near future. This band, whilst not usually producing the exotic DX sometimes offered by 14 Mc/s, has been consistent in that there have been good signals from many parts of the world. For some reason which is not immediately clear there is very little s.s.b. operation on this band, pride of place being taken by a.m. with c.w. closely following. Only one of our correspondents mentions 28 Mc/s and apart from occasional openings to Africa and S. America there has been nothing of interest on this band.

* * *

The letters and reports sent in by our numerous correspondents are gratefully acknowledged, as also is assistance from the *DX'-press* (PA0FX), the *W. Gulf DX Club Bulletin*, *DX* (W4KVX) and the *DX'er* (K6CQM).

News items, details of any unusual activity and notes on band conditions will be welcome, and should be sent to arrive at R.S.G.B. Headquarters not later than September 20.

Society News

Election of Council 1962

IN accordance with Article 55 of the Society's Articles of Association the Council have nominated the following Corporate members to fill the vacancies in the Council which will occur on December 31 next.

Officers:

President: Mr. E. G. Ingram (GM6IZ).
Executive Vice-President: Mr. N. Caws (G3BVG).

Ordinary Members:

Mr. R. Caws (G3BRL).
Mr. D. Deacon (G3BCM).

Not later than October 24 next any 10 Corporate Members may nominate any other Corporate Member to serve on the Council by delivering their nomination in writing in a single document to the Secretary, together with the written consent of such nominee to accept office if elected but each nominator shall be debarred from nominating any other person for this election.

Zonal Representation on Council

Not later than October 24 next any 10 Corporate Members resident in Zone A (Regions 1 and 2) may nominate any other duly qualified Corporate Member to serve as a Zonal Representative on the Council by delivering their nomination in writing in a single document to the Secretary together with the written consent of such nominee to accept office if elected, but each such nominator shall be debarred from nominating any other person for this election.

Candidates for Zonal Representative must be resident within the Zone for which they are nominated and the nominators must be resident in that Zone.

The present Zone A Representative is Mr. P. H. Wade (G2BPJ) of Leeds, Yorkshire.

Narrow Band Image (Slow Scan) System of Transmission

AS the result of discussions which have taken place between representatives of the G.P.O. on the one hand and representatives of the R.S.G.B. and the British Amateur Television Club on the other, the Radio Services Department of the Post Office have agreed to authorize a limited number of amateurs to use the narrow band image (slow scan) transmission system on all amateur frequencies from 28 Mc/s upwards, subject to the usual restrictions in respect to the band 144–145 Mc/s. The facility has been granted for two years initially.

The following stations are at present authorized to use slow scan: G3AS, G2AFD, G3AST, G3CCH, G3KCB, G3LEE and G3MED.

Further enquiries should be addressed to the Editor of *CQ TV*, John Tanner, 20 Hughenden Road, Bristol 8.

Radio Teleprinting

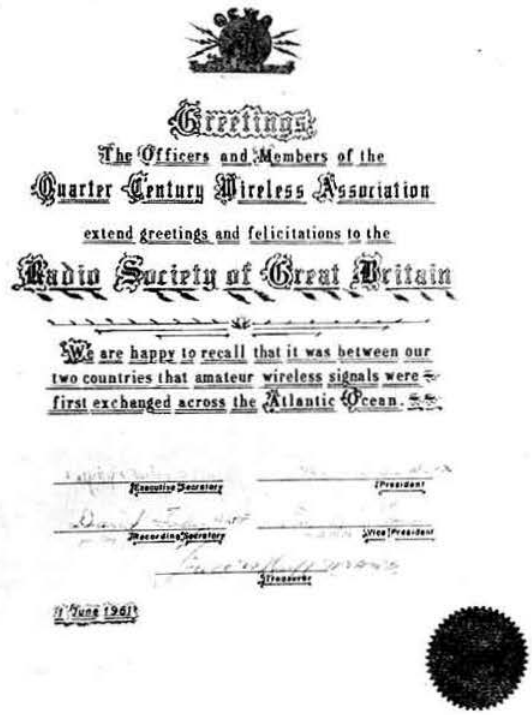
AS the outcome of negotiations which have taken place between the Society and the G.P.O., the Radio Services Department have now notified Headquarters that it has been decided to make specific reference to Radio Teleprinting in the Amateur (Sound) Licence. The Schedule to the Licence will, therefore, be amended by a footnote which will permit the use of this type of transmission on all amateur bands except 1·8–2 Mc/s.

Clause 1 (2) " Limitations," will also be amended in due course by the addition of the following sub-clause:

" The Station shall be used for the purpose of sending messages by radio teleprinter only with International Telegraph Code No. 2 (5—Unit Start-Stop) and with speeds of transmission of 45·5 or 50 bauds."

Q.C.W.A. Sends Greetings to the R.S.G.B.

DURING a recent visit to London, Col. Earl Thomas (W2MM), Vice-President of the Quarter Century Wireless Association, conveyed greetings and felicitations to the R.S.G.B. Col. Thomas was entertained to lunch by the President (Major-General E. S. Cole, C.B., C.B.E., G2EC), the Executive Vice-President (Mr. E. G. Ingram, GM6IZ), the Society's QSL Manager and Past President



(Mr. Arthur Milne, G2MI) and the Deputy Editor (Mr. John A. Rouse, G2AHL). During his visit, Col. Thomas handed to the President an illuminated certificate which is reproduced herewith.

The Quarter Century Wireless Association was founded in 1947 and now has a membership well in excess of 2,000. Membership is restricted to those who have held a transmitting licence for at least a quarter of a century.

Affiliated Society Representatives 1962

IN accordance with the announcement published on page 418 of the March 1957 issue of the R.S.G.B. BULLETIN, every society affiliated to the R.S.G.B. is entitled to nominate one of its members to serve as an Affiliated Society Representative for the year 1962.

Societies who wish to take advantage of this arrangement are requested to forward a nomination paper, duly signed by five members of the society, who are themselves Corporate Members of the R.S.G.B., to the General Secretary so that it arrives not later than November 15, 1961. In the event of more than one person being nominated as the representative of a particular society a ballot will be conducted, details of

which will be published in the December 1961 issue of the R.S.G.B. BULLETIN.

Nominees for the office of A.S.R. must be Corporate Members of the R.S.G.B. A.S.R.s enjoy the same privileges and have the same status as T.R.s.

More Pirates Fined

THREE youths who operated unlicensed radio transmitters were each fined £15 at Bilston, Staffordshire, on August 29, 1961. The prosecuting solicitor stated in court that G.P.O. engineers were constantly trying to track down a network of unlicensed stations which originated in Wolverhampton about four to five years ago. One of the accused, John Lewis of Leicester Street, Wolverhampton, was said to have been a founder member of the illicit network. The others were Lewis Keith Charles McLaughlin of Trysull Road, Wolverhampton, and Jeffrey Elwell of Spring Road, Lanesfield, Coseley, Staffs. All three explained to the Court that they had not applied for licences because they did not think they were capable of passing the Radio Amateur's Examination and G.P.O. Morse Test.

The prosecuting solicitor stated that the tracking-down of the offenders had cost the Post Office a great deal of public money and had caused an enormous amount of work.

On July 31, 1961, at Burnley Magistrates' Court, Herbert Victor Birtwistle of 67 Deerstone Avenue, Burnley, pleaded guilty to a charge of using wireless telegraphy apparatus without a licence. He was fined £5 and ordered to pay £5 5s. costs.

FSK Permitted in Australia

PERMISSION has been granted by the Australian Postmaster General for amateurs in Australia to use F1 emission (frequency shift keying) with a maximum shift of 850 c/s on all licensed bands for a trial period up to March 31, 1963. Amateur stations using this technique will be required to sign their call by hand speed Morse or radiotelephony.

The Wireless Institute of Australia will welcome reports concerning the use by Australian amateurs of this method of transmission and its effect on the normal use of the amateur bands.

Silent Keys

ERNIE HAYWARD (GW2UH)

The death occurred on August 13, 1961 at Yeovil, of Ernie Hayward (G2UH). He had moved there from the Cardiff area some eight years ago, but had not been active since his removal. He was licensed in 1937, and had previously held an A.A. call for many years. Despite having very limited time and resources, Ernie nevertheless constructed superb equipment and his station was always a model in this respect, its efficiency being reflected in the astonishing lists of 'phone DX which he worked.

No tribute to this kind and gentle man would be complete without reference to his never-failing inspiration and help to potential amateurs, to whom his door was always open. No effort was too great for him to spend on their behalf, and there are many licensed amateurs in the Cardiff area who owe much to his help and encouragement. His loss will be felt particularly by the older membership in the Cardiff area and by members of the Yeovil Amateur Radio Club, whose sympathy is extended to his widow and family. C. H. P.

D. E. BURGESS (G4OZ)

It is our sad duty to record the death, suddenly on July 20, 1961, of Douglas Burgess (G4OZ) of Osborne, near Sherborne, Dorset.

His cheerfulness and willingness to help others will be missed by his many friends in Amateur Radio circles. He was mainly active on Top Band and the v.h.f.'s.

To his wife and five children, the members of the Yeovil R.S.G.B. Group and the Yeovil Amateur Radio Club offer their deepest sympathy. B. J. C.

London Lecture Meeting
Friday, October 27, 1961

"Multiband Aerials Systems"

By G. A. Bird, Assoc. Brit.I.R.E., F.Inst.P.I. (G4ZU)

The lecturer will discuss such systems as the W3DZZ, Minibeam, Quad, Birdcage, G5RV and an entirely new type of ferrite loaded wire array for 10-80 metres.

Institution of Electrical Engineers, Savoy Place, Victoria Embankment

Buffet Tea 6 p.m. (Free.) **Lecture 6.30 p.m.**

U.S. Amateur Facilities Extended

THE United States Government has granted permission to U.S. amateurs to operate in the 14–14·35 Mc/s band while on the high seas. Effective August 21, 1961, U.S. amateurs in (or over) international waters may operate on 20, 15 and 10 metres, world wide, and on 40, 20, 15, 10, 6 and 2 metres while in Region II (the Americas).

Mr. L. W. Jones

WE have been asked to state that Mr. L. W. Jones (G5JO of Cambridge), whose appointment as Managing Director of Pye Electronic S.p.A. in Inverigo, Northern Italy, was announced in the May issue of R.S.G.B. BULLETIN, has not relinquished his position as Works Director of the group of companies. Mr. Jones will remain in England, where he will carry out the duties attached to both appointments.

Radio Amateurs' Examination

FOR several years the Society's representatives on the City and Guilds of London Institute Advisory Committee for the Radio Amateurs' Examination have urged the Institute to arrange two examinations each year instead of a single examination in May.

The Institute recently reviewed the arrangements for the conduct of the Examination and has now indicated its willingness to assume responsibility for the Autumn examination which in recent years has been conducted by the G.P.O.

Such an arrangement will undoubtedly be of advantage to and appreciated by those seeking to qualify for an Amateur (Sound) Licence, especially as the number of examination centres will be considerably increased.

The new arrangement will operate as from next year when Examinations conducted by the City and Guilds of London Institute will be held in May and November.

Courses of Instruction

CLASSES in preparation for the Radio Amateurs' Examination to be held in May 1962 will be held at the Spencer Park School, Trinity Road, London, S.W.11, on Mondays and Thursdays from 7.30–9.30 p.m. commencing September 25. In addition, there will be a course for those who have already passed the R.A.E. and will be concerned with the design, construction and operation of transmitting equipment.

Two classes (one for beginners and one for advanced students) in practical radio and television are being arranged at the Battersea Institute, Latchmere Road, London, S.W.11. The advanced class will deal with test gear and with the completion of a closed circuit TV system.

Enrolment for the above courses will take place from September 18–22. The fee for one course will be £1; for two, £1 2s. 6d.

Council Proceedings

Résumé of the Minutes of the Proceedings of a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, July 24, 1961, at 6 p.m.

Present: The President (Major General E. S. Cole, in the Chair), Messrs. N. Caws, C. H. L. Edwards, K. E. S. Ellis, E. G. Ingram, J. D. Kay, A. O. Milne, L. E. Newnham, F. K. Parker, F. A. Russell, P. H. Wade, A. C. Williams, E. W. Yeomanson (Members of the Council) and John Clarricoats (General Secretary).

Apologies for Absence

Apologies for absence were submitted on behalf of Messrs. R. C. Hills and G. M. C. Stone.

Absent. Dr. R. L. Smith-Rose.

* * *

Headquarters Accommodation

Resolved to ratify the action taken at a Special Meeting of the Council held on July 3, 1961, when consideration was given to a verbal report by the President and the Chairman of the Finance and Staff Committee regarding the acquisition of premises.

At that meeting it had been

Resolved (i) to take no action for a number of reasons on the project (ii) to prepare a statement for publication regarding a proposal to set up a Building Fund; (iii) to publish a letter from Mr. Maurice Child on the subject of Headquarters Accommodation in the same issue of the Society's Journal; (iv) to invite the President with Messrs. Caws, Milne and Kay to draw up the proposed statement.

Articles of Association

Further consideration was given to recommendations of the Finance and Staff Committee regarding amendments to the Society's Articles of Association.

Resolved (i) to accept the Recommendations; (ii) to authorize the Finance and Staff Committee to take legal advice on implementing the proposed amendments; (iii) to send to each Member of the Council a fair copy of the proposed amendments as drafted by the Society's legal advisers before submitting same to the Board of Trade.

Membership

Resolved (i) to elect 91 Corporate Members and 29 Associates; (ii) to grant Corporate membership to 4 Associates who had applied for transfer.

Applications for Affiliation

Resolved to grant affiliation to the C.F.S. Amateur Radio Club, R.A.F. Little Rissington, and Grantham and District Amateur Radio Society.

Amateur Radio Handbook

Consideration was given to a further progress report prepared by Mr. Rouse and to a verbal report submitted by the Secretary on the financial effects of increasing the size of the *Handbook* to 544 pages.

Resolved (i) to offer the *Handbook* to members at the pre-publication price of 28s. (postage extra); (ii) to allow members to purchase one copy each of the *Handbook* on submission of the special voucher to be included in members' copies of the October 1961 issue of the R.S.G.B. BULLETIN; (iii) the offer to remain open until the end of the 1961 R.S.G.B. Radio Hobbies Exhibition; (iv) to fix the retail price of the *Handbook* at 34s. (postage extra).

Lecture Meetings

Resolved (i) to agree in principle to a suggestion put forward by Mr. Russell that lecture meetings, having Society status, shall be held at intervals of not less than six nor more than twelve months in at least one major centre within each of the Society's Regions; (ii) to submit the suggestion to the next R.R.'s Conference; (iii) to consider at a later date a suggestion that the Society should sponsor public lectures in, e.g. university centres.

The Office of C.R.

Consideration was given to correspondence from four members regarding the decision of the Council to dispense with the office of C.R. as from January 1, 1963.

Resolved to request the Membership and Representation Committee to give consideration to the correspondence.

News Bulletin Service

Consideration was given to the terms and conditions governing the transmission of R.S.G.B. News Bulletins on Sunday mornings.

Resolved to draw the attention of members to the scope offered by the service.

Mobile Licence Holders

It was reported that the G.P.O. hoped shortly to send to the Society a list of holders of the Amateur (Sound Mobile) Licence.

Resolved to accept an estimate from Bentley & Co. Ltd. for printing a supplementary list of mobile calls only for inclusion in the 1962 edition of the *R.S.G.B. Amateur Radio Call Book*.

Official Regional Meetings

Resolved (i) to authorize Messrs. Kay, Milne and the Zonal Representative to represent the Council at the Cheltenham O.R.M. on October 8, 1961; (ii) to authorize Mr. Lewis to organize a raffle in connection with the O.R.M.; (iii) to authorize Messrs. Caws, Kay and the Zonal Representative to represent the Council at the Ayr O.R.M. on September 10, 1961.

Regional Representatives' Conference

Resolved (i) to hold an R.R.'s Conference in London during the autumn of 1961; (ii) to request the Membership and Representation Committee to prepare a draft agenda for the Conference; (iii) to advise the R.R.'s that a Conference is to be held and to invite items for inclusion on the agenda.

Reports of Committees

The Minutes of meetings of the following Committees were submitted as Reports: Exhibition, June 23 and July 17, 1961; Finance and Staff, June 24, 1961.

Resolved to receive the Reports.

National Mobile Rally

Authority was given to the Mobile Committee to incur certain small items of expenditure in connection with the National Mobile Rally to be held at Woburn Abbey on September 10, 1961.

QRV

It was reported that valuable publicity to the Society had been given in the current issue of *QRV*—official journal of the Royal Air Force Amateur Radio Society.

The meeting terminated at 9.50 p.m.

PLEASE HELP US...

- When writing to Headquarters do not include BULLETIN items, queries, changes of address and publication orders, etc., on the same sheet of paper. Only one envelope is necessary, but a separate sheet for each subject please.
- Always use block letters, or write clearly, your full name and address. Christian names, call-signs and illegible signatures cause much unnecessary checking.
- Notify Headquarters of impending changes of address several weeks before you move. Alterations to subscription reminders, etc., are not sufficient unless definite instructions are given. Include your B.R.S. number and/or call-sign, your present address and, if possible, the date your subscription falls due. Remember that BULLETIN wrappers are prepared up to three weeks before the publication date.
- When forwarding your subscription please return the reminder card sent to you from Headquarters, or, if this has been lost, indicate the date your subscription fell due.

...TO HELP YOU!

Can You Help?

- C. C. Bolland (G3EQK), 16 Minorca Place, Montagu Estate, Kenton, Newcastle-on-Tyne, 3, who requires the HRO manual?

GB2RS SCHEDULE

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

Frequency	Time	Location of Station
3600 kc/s	9.30 a.m.	South East England
	10 a.m.	Severn Area
	10.30 a.m.	North Midlands
	11 a.m.	North East England
	11.30 a.m.	South West Scotland
	12.00	North East Scotland
145·55 Mc/s	11.15 a.m.	Beaming south-east from Leeds
	11.30 a.m.	Beaming south-west from Leeds
	11.45 a.m.	Beaming north from Leeds
145·3—145·4 Mc/s	12 noon	Beaming north from South East England
	12.15 p.m.	Beaming west from South East England

News items for inclusion in the bulletins should reach Headquarters not later than first post on the Thursday preceding transmission. Reports from Affiliated Societies and from non-affiliated societies in process of formation will be welcome.

Regional and Town Representation 1962-1963

Regional Representatives

THE undermentioned Corporate Members have accepted an invitation from the Council to serve, if elected, in the office of Regional Representative for the period from January 1, 1962, to December 31, 1963.

Region	Name	Call-sign
1	B. O'Brien	G2AMV
2	J. R. Petty	G4JW
3	W. A. Higgins	G8GF
4	F. C. Ward	G2CVV
5	T. A. T. Davies	G2ALL
6	L. W. Lewis	G8ML
7	F. G. Lambeth	G2AIW
8	Office Vacant	
9	R. E. Griffin	G5UH
10	C. H. Parsons	GW8NP
11		
12	A. G. Anderson	GM3BCL
13	G. P. Millar	GM3UM
14	D. R. Macadie	GM6MD
15	J. W. Douglas	GI3IWD
16		
17	M. P. Nicholson	G2MN

Not later than October 31 next, any five Corporate Members resident in a particular Region may nominate any other duly qualified Corporate Member resident in that Region for the office of Regional Representative, by delivering their nomination in writing to the General Secretary, together with the written consent of such person to accept office if elected. Each such nominator shall be debarred from nominating any other person for the current election of Regional Representatives.

Town and Area Representatives

Not later than October 31 next, any five Corporate Members resident in a particular Town or Area may nominate any duly qualified Corporate Member resident in the particular Town or Area for the office of Town or Area Representative, by delivering their nomination in writing to the General Secretary, together with the written consent of such person to accept office if elected.

In the case of the City and County of London, Area Representatives may be nominated for groups of Postal Districts. In the case of certain other large towns, Area Representatives may be nominated on a geographical basis, viz., North Birmingham, South-East Manchester.

Town or Area Representatives will only be confirmed in their appointment if the total membership in the Town or Area they propose to represent is at least 10.

Vacancies

In the event of no nomination being received prior to November 1, 1961, from the Corporate Members resident in any Region, Town, or Area, the Council reserves the right to make an appointment.

Ballots

In the event of more than one person being nominated for a particular office a Ballot will be conducted, details of which will be published in the November 1961 issue of the R.S.G.B. BULLETIN.

Resignations

If for any reason an elected Representative wishes to resign his office, he should notify Headquarters who will advertise the vacancy. *Local members cannot automatically appoint another member to undertake the duties of a representative who has resigned.*

The Council reserves the right to call upon any representative to resign his office if, in their opinion, he is considered to be unsuitable or unsatisfactory.

Period of Office

Regional, Town and Area Representatives will hold office for a period of two years as from January 1, 1962.

Regions and Counties

The following is a list of the Regions and Counties (or Districts) forming them:

Region 1 (North Western). — Cheshire; Cumberland; Lancashire (East); Lancashire (West) and the Isle of Man, Westmorland.

Region 2 (North Eastern).—Durham; Northumberland; Yorkshire (East); Yorkshire (North); Yorkshire (West).

Region 3 (West Midlands).—Herefordshire; Shropshire; Staffordshire; Warwickshire; Worcestershire; Birmingham (Postal Area).

Region 4 (East Midlands).—Derbyshire; Leicestershire and Rutland; Lincolnshire; Northamptonshire; Nottinghamshire.

Region 5 (Eastern).—Bedfordshire; Cambridgeshire; Hertfordshire (outside London Region); Huntingdonshire.

Region 6 (South Central).—Buckinghamshire (outside London Region); Gloucestershire (excluding the Bristol Area); Oxfordshire.

Region 7 (London).—London North; London South; London South-East; London South-West; London East; London West.

Notes.—(1) In the London Region the six Representatives concerned are known as District Representatives.

(2) The London Region covers the whole of Middlesex and Surrey and all other territory within 25 miles radius of Charing Cross.

Region 8 (South Eastern).—Kent (outside London Region); Sussex.

Region 9 (South Western).—Bristol; Cornwall; Devonshire; Dorset; Somerset.

Region 10 (South Wales).—Brecknockshire; Carmarthenshire; Pembrokeshire and Cardiganshire; Glamorgan; Monmouthshire and Radnorshire.

Region 11 (North Wales).—Anglesey and Caernarvonshire; Denbighshire; Flintshire; Merionethshire and Montgomeryshire.

Region 12 (North Scotland).—Aberdeen, Banff and Kincardine; Angus and Perth; Moray and Nairn; Inverness, Ross, Sutherland, Caithness, Orkney and Shetland.

Region 13 (East Scotland).—Berwick; Peebles; Roxburgh and Selkirk; East, Mid- and West Lothian; Fife and Kinross.

Region 14 (West Scotland).—Argyll and Dumbarton; Ayr, Bute, Dumfries, Kirkcudbright and Wigtown; Clackmannan and Stirling; City of Glasgow (Postal Area), Lanark and Renfrew.

Region 15 (Northern Ireland).—Antrim; Armagh; Down; Fermanagh; Londonderry, Tyrone.

Region 16 (East Anglia).—Essex (outside London Region); Norfolk; Suffolk.

Region 17 (Southern).—Berkshire (outside London Region); Hampshire, Wiltshire, the Channel Islands.

CONTEST NEWS

RESULTS — REPORTS — RULES

First 144 Mc/s Field Day 1961

THE First 144 Mc/s Field Day, held on May 7, 1961, went off quietly, conditions being quite normal for the time of year; only a few contacts over 200 miles were made. These remarks refer of course to tropospheric conditions but during the contest G3GOP/P broke the European 144 Mc/s record with a contact with YU1CW by sporadic *E*. Last year during this contest there was an auroral opening—what's the betting for 1962?

The winner this year was P. W. Winsford (G4DC/P) with B. A. Maycock (G3JWQ/P) as runner-up. As will be seen, a number of members have not been placed because of errors in their entries; these are not minor points and the following are the reasons for the various requirements. In the case of multi-operator entries, it is undesirable for a /P station to work its own operators for points, hence a list of operators is called for (General Rule 7). With the aid of the N.G.R.'s the distance between any two stations can be calculated to a far greater accuracy than can be read on a map—a few minutes on a desk calculator and an entry can be quickly checked, therefore N.G.R.'s please. If an operator receiving a QTH over the air cannot find it on a readily available map he obviously cannot measure the distance required for his entry. The Contests Committee has chosen the "10 mile" map because it is a convenient size as a wall map for the shack and is marked with the National Grid. Any place name on the "10 mile" map can be found on the larger scales but not vice versa. Once such a QTH has been transmitted the Committee must check that it has been received correctly, hence the "QTH as sent" is required on the Cover Sheet, and so on. The rules are not just a bureaucratic inconvenience—they have been developed in the light of experience either to improve the Contest or to stop unfair practices.

FIRST 144 Mc/s FIELD DAY

Position	Call-sign	Contacts	Points
1	G4DC/P	105	8293
2	G3JWQ/P	94	8263
*	G2HIF/P	92	8145
4	G3GOP/P	45	7630
§	G3NNG/P	79	7085
*	G3LCH/P	101	6741
7	G3KMT/P	66	6409
*	G3MAR/P	74	6296
9	G3AYT/P	94	6232
‖	GW3JJA/P	71	6088
11	GW4LU/M	62	6068
12	G3KEF/P	74	5983
¶	G3FD/P	74	5692
¶	G3GZJ/P	56	5583
15	G3LLK/P	77	5015
16	G5HZ/P	79	4484
*	G3ERD/P	58	4409
18	G3JZW/P	51	4335
19	G3LTF/P	64	4068
20	G3JLA/P	43	3827
‖	GW3KYT/P	49	3655
22	G3LCS/P	37	3647
‖	G3MNQ/P	48	3607
†	G3OBD/P	43	3362
25	G2RD/P	38	3216
†*	G3AEX/P	73	3120
27	G3GCX/P	26	2823
*	G3MI/P	52	2497
29	G5ZT/P	23	2287
‡	G3EFX/P	46	2226
31	G2DHV/P	50	2192
*	G3ION/P	32	2112
‡†	G3AS/M	28	2042
‡	G8LM/P	35	1620
35	G2HCJ/P	33	1567
36	GW3CBY/P	15	1523
37	G3ASU/P	33	1468

* Names or call-signs of operators not given on cover sheet. General Rule 7.
† N.G.R. not given on cover sheet.
‡ QTH could not be found on O.S. "10 mile" map.
§ No "distances" given.
‖ "QTH as transmitted" not given on cover sheet.
¶ Incomplete declaration. General Rule 5.

One cynic has suggested that entrants look up the road distance for their entries in the *A.A. Handbook* and use that; another has suggested that entrants measure on the A.A. maps but include the margins. Unfortunately neither of these suggestions can account for some of the gross overestimates of distance; far worse, however, are those who add a mile or two on each contact for "good measure." One entrant this time had 157 points docked from 27 QSO's and these were just the ones the Committee were able to check! Such then is the standard of entries for recent contests: out of an entry of 37 for this contest only 11 were completely satisfactory.

One last point, please do not write comments intended for *Four Metres and Down* on your entries: loose sheets are all right but should be clearly marked. The entries are not examined in detail until after the last date for posting by which time any news is quite dead.

G3BBR, G3HWR, G3LTN, G4JJ and B.R.S.18572 are thanked for their check logs; that from B.R.S.18572 was especially useful.

R.S.G.B. 1250 Mc/s Tests 1961

A TOTAL of eight stations took part in the 1250 Mc/s Tests on June 10-11, 1961, all in the Home Counties and a total of eight contacts was reported, as the table indicates. In the column under each call-sign are the reports received from the receiving stations: "*" indicates that an unsuccessful attempt at contact was made. Reports were received from G2RD, G3FP and G3FEX. In most, if not all, cases contact was first established on 70cm and it appears that equipment for this band is an essential stepping-stone to 23cm. The additional equipment for 23cm seems quite straightforward as the following descriptions indicate.

The equipment at G2RD consists of a CV90 tripler driven by the QQV03-20 p.a. of his 70 cm rig while the receiver uses a 6J6 oscillator chain to 428 Mc/s followed by a germanium diode tripler to 1284 Mc/s. The mixer is in a radial cavity

Receiving Stations	Transmitting Stations							
	G2RD	G3FD	G3FEX	G3GDR	G5DT	G6NF	G8AL	G8RW
G2RD	—	59	—	559	—	—	56	—
G3FD	59	—	—	529	59	—	55	—
G3FEX	—	*	—	—	—	—	—	—
G3GDR	558	549	—	—	—	—	—	—
G3DT	59	59	—	—	—	—	—	—
G6NF	*	—	—	—	—	—	—	—
G8AL	559	55	—	—	—	—	—	—
G8RW	—	*	—	—	—	—	—	—

giving an i.f. of 12 Mc/s into an HRO. The aerial is an 8-over-8 Yagi at 41 ft.

G3FP runs a 2C39A tripler giving about 6 watts (for 21 watts input) on 1298·26 Mc/s while the receiver uses a CV364 crystal diode mixer which gives an i.f. of 10-14 Mc/s; the oscillator is crystal controlled, of course. Two aerials in use are an 8-over-8 slot fed Yagi and a 3 ft. paraboloid at 41 ft. and 30 ft. respectively. G3FEX runs an s.e.o. transmitter which he is too modest to describe, but the receiver is similar to G2RD's. The aerial is also an 8-over-8.

The Contests Committee now has a record of 26 stations who have had equipment on 23cm, most of them in the Home Counties, but the band activity at any one time seems pretty steady.

The Committee has examined the three entries carefully and have regretfully come to the conclusion that none of them

is of outstanding merit and it is therefore being recommended to Council that the *Arthur Watts Trophy* should not be awarded this year.

70 Mc/s Contest 1961

AN entry of 12 contestants and three check logs for the 70 Mc/s Contest held on June 17-18, 1961, must be considered very fair when the total number of stations logged was 55. Conditions seem to have been good on the Saturday evening but they deteriorated later in the contest and there were very few contacts after midday on Sunday. The total contacts logged was 181, no less than 76 of these taking place during the first two hours from 17.00 to 19.00 G.M.T. on Saturday. There were 57 contacts on Sunday between the start at 07.00 and 12.00 G.M.T.

Comments from users of the band indicate that several " regulars " were not on at all and with activity concentrated into two short spells there were long periods of fruitless listening.

70 Mc/s Contest June 17/18, 1961

Posn.	Call-sign	Location	Pts.	Con-tacts	Best contact claimed	miles
1	G3KEU/P	6 miles s.e. of Swindon	1516	24	G5CP/A	115
2	G3CLW	Bromley, Kent	1369	31	GW3MFY	158
*	G5FK	3 miles e. of Ruislip	1045	37	GW3MFY	143
3	G3NDF	Gt. Bookham, Surrey	999	24	GW3MFY	143
4	G5CP/A	5 miles s. of Chesterfield	987	16	G3CLW	142
5	GW3MFY	Bridgend, Glam.	554	5	G3CLW	158
6	G3BNL	7 miles s. of Nottingham	542	8	G3EHY	130
7	G3MHD	Stanford-le-Hope, Sussex	343	11	G3KEU/P	94
8	G3MNQ	8 miles s. of Nottingham	251	6	G3CLW	111
9	G3HRP	Scunthorpe	241	8	G3MNQ	60
10	G4OF	Gainsborough, Lincs.	190	7	G8CB	45
11	G3FEX	Storrington, Sussex	151	4	G3KEU/P	68

* No declaration, no location given—reported location shown.

Tim Leighfield (G3KEU) operating portable south-east of Swindon was the winner with 1,516 points and a best contact of 115 miles. With a maximum input of 8 watts to a QQV03-10 p.a. and a three element beam at 12 ft., he and his second operator, G3HSV, are to be congratulated on their efforts. In second place came W. J. McInnes (G3CLW) who operated from his home at Bromley, Kent, running 50 watts to an 829 and a five element beam. G3CLW had the best DX contact logged in the Contest with GW3MFY at 158 miles.

Included in the table in the next place is G5FK, the station operated by members of the Radio Section of the Research—G.E.C. Social and Athletic Club and their efforts produced 1,045 points from 37 contacts but due to an unfortunate omission this station gets only a mention rather than a placing.

The nominal third place therefore goes to Ralph Cathles (G3NDF) of Great Bookham, Surrey, who ran 15 watts to a four element beam. Mention must also be made of GW3MFY who, with five contacts, ran up a score of 554 points. He causes TVI as there is a TV station on 67·25 Mc/s in his area, so his activities were restricted to one contact only on Saturday and then he had one each hour between 9 a.m. and 1 p.m on Sunday.

There were a few cross-band-to-144 Mc/s contacts. G3CLW had four and G5FK had 12 but there has been some criticism of this method of operating and the Committee will reconsider this rule if sufficient protest is forthcoming before next year.

Check logs from A.2122, G3LTN and G6XX, are gratefully acknowledged.

High Wycombe D/F Qualifying Event

TEN competitors took part in the High Wycombe qualifying event on July 9, 1961, in perfect weather, starting from Winter Hill, a well-known Buckinghamshire beauty spot overlooking the Thames. The high ground contributed to the good signals received at the start, although in fact the transmitter was over 14½ miles due north, hidden in a well camouflaged tent in the midst of tall bracken.

E. L. Mollart and M. P. Hawkins of the Oxford Club were on the scene almost simultaneously, but Mr. Mollart literally stumbled upon the transmitter again to take first place by a short head. After an appreciable interval, J. K. Finch of High Wycombe arrived from the opposite direction to be shortly followed by E. W. Bristow of Oxford.

Nine of the 10 starters successfully located the transmitter in what was by no means an easy contest and it is obvious that D/F enthusiasts are benefiting greatly from their experience in these events and are achieving times which would have seemed impossible only a few years ago.

At the conclusion of the event, over 40 people took tea at the Little Abbey Hotel, when the High Wycombe trophy —now in its 10th year—was presented to Mr. Mollart for the third time and prizes kindly donated by Mr. Norman Turner were awarded to the first three competitors to arrive. Mr. D. A. Findlay, D.F.C., of the Contests Committee was a welcome visitor, and expressed his thanks to the organizer, G. T. Peck, and to A. Dixon (G3FAS) for a very successful day.

Rules for the R.A.E.N. Rally 1961

1. The Rally is open to all R.A.E.N. members and will be divided into three groups:
   (*a*) Outstations (R.A.E.N. members operating portable or mobile);
   (*b*) Fixed stations (R.A.E.N. members operating from home stations);
   (c) Receiving stations (R.A.E.N. members operating as receiving stations at home or as outstations).
   Stations must be individually operated. Group operation of single stations is not permitted.

2. The Rally will take place on **Sunday, October 8, 1961,** from 09.00 to 12.00 G.M.T., 14.00 to 17.00 G.M.T. (telephony) and from 18.00 to 21.00 G.M.T. (Morse code A1). Operation will be in the 1·8, 3·5, 28 and 144 Mc/s bands. R.S.G.B. band planning must be observed. Licensed power must not be exceeded.

3. Outstation equipment must not be connected in any way to the public mains electricity supply and must be located at least one mile from home or other normal fixed station site.

4. **Scoring—Transmitting Sections.**
   Contacts will score points as follows:
   Outstation to outstation—5 points.
   Outstation to fixed station—3 points.
   Outstation to non-R.A.E.N. station—1 point.
   Fixed station to outstation—3 points.
   Fixed station to fixed station—2 points.
   Fixed station to non-R.A.E.N. station—1 point.
   Ten scoring contacts only will be allowed with non-R.A.E.N. stations during the rally.
   No station may be worked more than once on each band by the same mode of sending. (G3XXX, G3XXX/P and G3XXX/M count as one station for scoring purposes.)
   The best two periods' scores will be counted for placing.

5. Each participant will, on application to his A.C. (or the Honorary Secretary, R.A.E.N. Committee in cases where participants have no A.C.) be issued with a **test phrase.** This test phrase will be passed to the first R.A.E.N. station contacted, in exchange for the test phrase from that station. The test phrase received will be passed to the next R.A.E.N. station contacted, in exchange again, and so on. No test phrase will be passed to non-R.A.E.N. stations. **A.C.s should make application for block issues of test phrases to the Honorary Secretary, R.A.E.N. Committee, by not later than September 26, 1961.**

6. Stations will call " **CQ from Raynet station . . .** " and sign " **from Raynet station . . .** " The letters or word RAEN is forbidden.

7. **Printed log sheets** will be issued at the same time as the test phrases by the Honorary Secretary, R.A.E.N. Committee, to all participants through A.C.s in cases where there is an A.C.
   Completed entries for all the periods worked must be returned to the **Honorary Secretary, R.A.E.N. Committee, 1 Shortbutts Lane, Lichfield, Staffs.,** postmarked not later than **Monday, October 23, 1961.** Location and signal reports must be given, received and logged.
   Participants should complete, on the top sheet of their log, the details of their station, in the appropriate spaces provided. The declaration must be signed.

8. **Receiving Stations—Scoring and Logs.**
   Receiving stations will score three points per R.A.E.N. station heard in contact, provided that the details required by the printed log sheet are correctly recorded therein.
   Receiving stations operating portable or mobile will receive a bonus of one point per R.A.E.N. station correctly logged.
   Logs must be submitted on printed sheets obtained from the Honorary Secretary, R.A.E.N. Committee through A.C.s or direct where participants have no A.C. The details and declaration required should be completed and signed on the top sheet only.
   Entries should be posted to the Honorary Secretary, R.A.E.N. Committee and should be postmarked not later than **October 23, 1961.**

9. **Awards** will be made to the participants who score the highest number of points in each of the groups: Outstations, Fixed Stations and Receiving Stations.

R.S.G.B. Slow Morse Practice Transmissions

The following Slow Morse Practice transmissions are sponsored by the Society. Those responsible for the transmissions have a duty to th membership to adhere to the schedule but if they cannot do so for any reason they should notify the Honorary Organizer, Mr. C. H. L. Edward (G8TL), 28 Morgan Crescent, Theydon Bois, Essex.

Time	Call-sign	kc/s	Town
Sundays			
09.00	G3BHS	1910	Southampton
09.30	G3HNJ / G3OFP / G3OMJ	1840	Doncaster
10.15	G3CGD	1875	Cheltenham
11.00	G3GZE	1840	Blackburn
11.00	G2FXA	1900	Stockton-on-Tees
11.00	G3HZM	1860	Manchester
11.00	G3NXQ	1850	Warndon, Worcs.
12.00 †	G3HVI / G3IVB / G3OGD	1920	Stoke-on-Trent
12.00	GI5UR	1860	Belfast
20.30	G3HTA	1850	Exeter
Mondays			
18.30	G3NC	1825	Swindon
19.00	G3KTP	1850	Heanor, Derby
19.00	G3LMT	1850	Exeter
19.00	G3MXS	1915	Wirral
19.30	G3AJD	1865	Barnet
20.00	G3BMY	1838	Birmingham
20.00	G3GZE	1840	Blackburn
20.00	G3NIM	1910	Southampton
20.30	G3AGN	1875	Felixstowe
20.30	G3MXI	1910	Derby
21.30 †	G3IRM / G3MWO	1981	Bury St. Edmunds
21.30 †	G3LGK / G3MXI	1980 / 1980	Ilkeston, Derbys. / West Hallam, Derbys.
21.30	G3NOE	1900	Bradford
Tuesdays			
17.30	G2AAM	1875	Swanwick, Derbys.
18.00	G3GZE	1840	Blackburn
18.30	G2FXA	1900	Stockton-on-Tees
19.00	G3ONB	1850	Kirkby-in-Ashfield
19.30	G3AJD	1865	Barnet
19.30	G3IAG	1930	Littleport, Cambs.
20.00	G2FCI	1850	Exeter
20.00	G3NHR	1900	Hounslow
20.00	G3NXY	1910	Southampton
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3MEH	1900	Old Coulsdon, Surrey
20.30	G3NKX	1875	Loughton
21.00	G3EFA	1855	Southport
21.00	G3LSC / G3MKN / G3NUN	1875	Poole
21.15	G2CPL	1875	Felixstowe
21.45	G2UK	1875	Lowestoft
22.00	G2CZU	1900	Bath
22.00	G3AWL	1980	Wingate, Co. Durham
Wednesdays			
19.00 †	G3MCJ / G3FLK / G2FCI / G3HTA	1845	Exeter
19.00	G3LZC	1830	Heanor, Derby
19.00	G8RQ	1850	Chesterfield
19.30	G2BSQ	1930	Ashtead, Surrey
19.30	G3AJD	1865	Barnet
19.30	G3IAG	1930	Littleport, Cambs.
19.30	G3NQR	1875	Harrow Weald

Time	Call-sign	kc/s	Town
Wednesdays			
19.45	G3KFE	1950	Stevenage
20.00	G3BHS	1910	Southampton
20.00	G3GZE	1840	Blackburn
20.00 †	G2HDR / G3IZM / G3OLB / G3OUK	1910	Bristol
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3MXI	1910	Derby
21.00 †	G3HVI / G3IVB / G3OGD	1920	Stoke-on-Trent
21.00	G3LSC / G3MKN / G3MXF	1875	Poole
21.00	G3AGX	1920	Hull
21.30	G3HNJ / G3OFP / G3OMJ	1840	Doncaster
21.30	G3NOE	1900	Bradford
22.00 †	G3LGK / G3MXI	1980 / 1980	Ilkeston, Derbys. / West Hallam, Derbys.
22.00	G3NXQ	1850	Warndon, Worcs.
Thursdays			
17.30	G2AAM	1981	Swanwick, Derbys.
18.30	G3NC	1825	Swindon
19.30	G3AJD	1865	Barnet
19.30	G3IAG	1930	Littleport, Cambs.
20.00	G3NBV	1910	Southampton
20.00	G3NHR	1900	Hounslow
20.15	G2AYQ	1875	St. Agnes, Cornwall
21.00	G3OST	1910	Purley
21.30	G3HMY	1850	Exeter
21.30 †	G3IRM / G3MWO	1981	Bury St. Edmunds
22.00	G2CZU	1900	Bath
22.00	G3AWL	1980	Wingate, Co. Durham
Fridays			
18.30	G3DMN / G3FVP	1880	Ipswich
19.00	G3JKY	1900	Beckenham
19.30	G3AJD	1865	Barnet
19.30	G3FUA	1850	Kilburn, Derby
19.30	G3IAG	1930	Littleport, Cambs.
19.30	G3MHR	1850	Swanwick, Derbys.
20.00	G2BOJ / G3NXZ	1840	Doncaster
20.00	G3IQS	1915	Totton
20.00	G3NYB / G3NXZ	1980	Doncaster
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3ICX	1915	Sutton Coldfield
20.30	G3KGU	1915	Theydon Bois, Essex
21.30 †	G3NPO / G3KSS	1900	Bradford
22.00 †	G3LGK / G3MXI	1980 / 1980	Ilkeston, Derbys. / West Hallam, Derbys.
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees

† *Alternately*

Alterations and additions to this list should be sent to the Honorary Organizer.

Mark Denny (G6DN) on ITV

A FEW days before the South Manchester and Stockport Mobile Rally took place on August 27, the South Manchester Radio Club A.S.R. (Mark Denny, G6DN) appeared in the Granada Television programme *People and Places*. He was interviewed about the work of the R.S.G.B. and R.A.E.N. and in the course of the programme drove his car on to the " set " to demonstrate a mobile contact. Those who watched the programme were warm in their praise of Mark Denny's fine performance.

Can You Help?

● L. Miles (GW3IMQ), 76 Vicarage Road, Morriston, Swansea, who wishes to know the impedance values of the secondary of the transformer (type XT 3051) fitted in the output stage of the R.C.A. speech amplifier type MI-7179B.

R.S.G.B. INTERNATIONAL RADIO HOBBIES EXHIBITION

November 22-25, 1961

For a successful display in the Home Constructors' section, the Exhibition Committee requires the loan of home-built equipment. Offers, together with full details, should be sent to Mr. C. Waterman, (G3NKX), 46 Danbury Road, Loughton, Essex.

Letters to the Editor . . .

Neither the Editor nor the Council of the Radio Society of Great Britain can accept responsibility for views expressed by correspondents. Letters for inclusion in this feature should be concise and preferably not more than 200 words in length.

New Society Headquarters visualized as major Golden Jubilee Celebrations

DEAR SIR,—With reference to the questionnaire enclosed with the April BULLETIN and also to the leading article in the May issue, the former invites suggestions in regard to the celebration of the Society's Golden Jubilee in 1963.

I suggest that every effort should be made between now and then for the Society to acquire suitable premises for its permanent headquarters. This is a matter which has been in my thoughts for a considerable time and I have noted, not without some anxiety and misgivings, the increasing values of properties such as I have in mind, and unless something is done soon the problem is likely to prove increasingly difficult of solution.

In your Editorial you propound several possible reasons for poor attendances at lectures. I venture to suggest one or two other reasons with a view to assisting those who may be actively concerned in arriving at a decision, as to the desirability of the above suggestion, and also as to the ways and means of carrying it out. Firstly, I think it is probable that a substantial proportion of the 2000 members referred to possess cars and would use them for both attending the lectures and returning home thereafter. Not doing so, however, may well be tied up with traffic congestion and the difficulty and expense of finding parking space reasonably near to the I.E.E.

Secondly, the increased cost of public transport together with reductions of evening services may be a contributing factor.

I endorse the suggested explanation in the fourth paragraph of the Editorial which brings me to the point of amplifying the second paragraph of this letter.

I consider the Society should invest a large proportion of its accumulated funds in a property fairly accessible to a " ring " road e.g. the North Circular Road, possibly in the North West or West part of London, as on balance either of these areas would seem to meet the future convenience of the majority of the membership, especially those coming to London from the North. The house itself should have large rooms on the ground and first floors, two of which should be capable of being thrown into one to provide good lecture accommodation. A lounge and/or reading room is an obvious requirement and, according to the space available, the latter might also, at first, house the historical apparatus and documents already in the Society's possession but not yet on display to members. Ample ground space should be available for car parking which feature would, in all probability, eliminate the cost of garden upkeep.

A great deal of expense in connection with decoration, adaptation wiring etc. could be saved by organising small volunteer " working parties " of younger members amongst whom there are probably a considerable number capable of rendering useful service in one way or another. In this connection I would cite the Railway Preservation Societies in widely divergent parts of the country, which are successfully operating and maintaining public services by purely voluntary effort, the lines in question in some instances having been closed, or were about to be closed by British Railways as part of the so-called " economy drive "! One particular light railway of which I have some intimate knowledge is on the Welsh coast. Working parties travel from the Midlands, London, East Coast and Scottish areas, even during the winter months, for the purpose of track maintenance, painting, repairs to buildings, rolling stock, etc.

Space prevents me enlarging here on the benefits and prestige which would accrue to the Society from the type of headquarters I have visualized not only in this country but also to those coming on visits or business from abroad. The old idea of centralizing businesses and offices in the middle of cities and towns is gradually changing in order that modern transport facilities can be much more conveniently utilized. Access problems of the past are no longer of such importance as they were. Time and fuel wasting are the modern factors to be avoided so far as possible.

The opening of new Society headquarters during 1963 would, I suggest, offer the Society a very fine opportunity of celebrating its Golden Jubilee.

Subject to the Council deciding to adopt such a scheme I have outlined I am prepared to guarantee by Will or otherwise, the sum of not less than 50 guineas within the next 15 months to be devoted towards defraying some of the cost involved.

Yours faithfully,

MAURICE CHILD (late NWX and 2DC)

Merrow, Guildford, Surrey. *Vice-President*, R.S.G.B.

Operating Practices

DEAR SIR,—The *Current Comment* in the June issue seems to be causing considerable comment regarding telephony and contest operation.

The views expressed by G2FMJ in the July BULLETIN are not, I feel sure, shared by many amateurs throughout the world. I see no reason why telephony and telegraphy transmissions should not take place on the h.f. bands without interference between the two. It is the minority on both sides that cause the conflict between the 'phone and c.w. operator by radiating bad signals in their mode of transmission.

In the defence of the contest enthusiasts, may I point out to the critics, that although most weekends have some form of contest taking place, they are not always on the same bands or using the same form of transmission. Friction between the contest operator and the " rag chewer " can usually be overcome by operating the bandchange switch or v.f.o. control. Even without the facility of band changing, anyone would be extremely unlucky to find a contest on more than four weekends in the year taking place on their favourite band. If contest enthusiasts are in the minority, it seems strange that activity is always at its highest during a contest period.

Amateur Radio is a hobby that can be enjoyed by people with varying interests. Let us not dictate to each other regarding how we are to enjoy our hobby. Let us all comply with the amateur code and not lessen the pleasures of others, whether they be in the majority or minority group.

Yours faithfully,

M. PHARAOH (G3LCH).

Mitcham, Surrey. *Hon. Secretary*, Mitcham and District Radio Society.

Band Planning and Net Working on " Two "

DEAR SIR,—I have read with interest the letters from G5UM, G3HBW and the notes of G3OHD.

As a result of 31 years of Amateur Radio on all bands, I am afraid I do agree mainly with G3HBW. I certainly cannot agree with G5UM's comment " those who want DX made easy should transfer to 160m, which is a more natural c.w. band than Two." Surely we are still learning methods of DX communication on this band, and I feel that local net operation should take place on 160m, the propagation properties of which are well known.

What disturbs me mostly is the entire lack of c.w. operation on Two. I have spent many evenings during the last few months, calling CQ on c.w. without a reply, when I am sure there were quite good openings.

I have heard G4JJ/A (Chesterfield) coming in RST559 on c.w. At the same time a number of weak phone carriers were unintelligible in QSB. A switch to c.w. and we may have had a few GDX contacts! I feel convinced that the modern generation of two metre addicts do not realize what DX they are missing, by not going over to this mode of operation.

For one example, recently during poor conditions, I managed to raise G3NAE (Bournemouth), who was calling CQ on phone. I could not read 5 per cent. of his reply due to QSB, QRN, etc.; however, after asking him to go over to c.w. his signals were 100 per cent. intelligible, and appeared to be quite loud.

May I plead for more c.w. activity on Two?

Yours faithfully,

Bexley, Kent. R.G.D. HOLMES, M.I.E.E., M.Brit.I.R.E. (G6RH).

DEAR SIR,—Whilst not wishing to become too deeply involved in the controversial Net/DX 2 metre operational frequencies, the following comments typify the Northern Ireland attitude.

Most mainland stations are DX to a GI, therefore local nets occupy the major operational time. No difficulty is experienced operating both DX and nets simultaneously—they are certainly not as incompatible as G3HBW implies. Practically all GI operators use surplus type FT243 8100 or 8106·7 kc/s crystals—these being either polished or pencilled such that each station has its characteristic frequency, a minimum tolerable separation being approximately 5 kc/s.

It should be stressed that it is a very simple job, with the above crystals, to move the operating frequency ± 100 kc/s. (See postscript).

In the event of GM plus DX being heard, a local net would rapidly close down, due solely to the unique situation that, whilst Scotland shares Zone 9 with us, a station may be 300 or more miles away.

Only under exceptional circumstances can there be any valid excuse for operating at any time out of zone, whether the band is open to DX or a local ragchew is in progress. Furthermore, one cannot understand the reasoning behind the various propositions that one whole megacycle should be set aside for net operation (ideally a one frequency system), whether it be the top, middle or lower one. G3HWR is surely thinking along the right lines in suggesting a net frequency for each zone. However, one believes it would be more convenient to encourage use of the lower (or upper) 50 kc/s of each zone for net operation. This would overcome difficulties where several nets in one zone QRM each other.

The Band Plan as it exists, provides tremendous aid to DX working—indeed, being created so that there should be a minimum of interference.

A little more courtesy shown by the " big boys " troubling G5UM in avoiding his netting frequency—similarly, a little more courtesy shown by net station operators in sticking to a fixed frequency *within* the band plan zone, will result in less frustration and annoyance to both net and DX operators alike.

Yours faithfully,

Belfast, Northern Ireland. P. G. BOWER (GI3OFT).

P.S.—One quarter teaspoonful of Vim, or other fine abrasive kitchen cleaner, to half teaspoonful water makes a good crystal polishing mixture. Place this on a glass plate. Four or five rotary motions with firm pressure on the crystal, around a radius of approximately an imaginary penny, will move an FT243 crystal approximately 0·5 to 1 kc/s h.f. Lighter pressure results in less frequency shift. Wash in clean water, carefully blot dry and replace in holder.

Also two light HB pencil strokes along the edge of one face of the quartz will reduce the frequency approximately 0·5 kc/s to 1 kc/s.

G.P.O. Policy—
Close Coupling of Amateur and TV Aerials

DEAR SIR,—With reference to the policy statement on close coupling of amateur and TV aerials, published on page 82 of the August BULLETIN, what a pity it was not to have included a statement of the official interpretation of the dubious term " second-comer " as well as the line to be taken in those cases where tenancy restrictions prohibit the erection of outdoor aerials.

As it stands, some members see the published policy as a warning of their impending doom so far as Amateur Radio is concerned, but may I hastily add that provided their operation is in accordance with the otherwise long standing conditions prescribed in the licence, they need have no fears of this kind. Moreover, they may take consolation from the fact that there is only one outstanding case of this sort of interference on the official files.

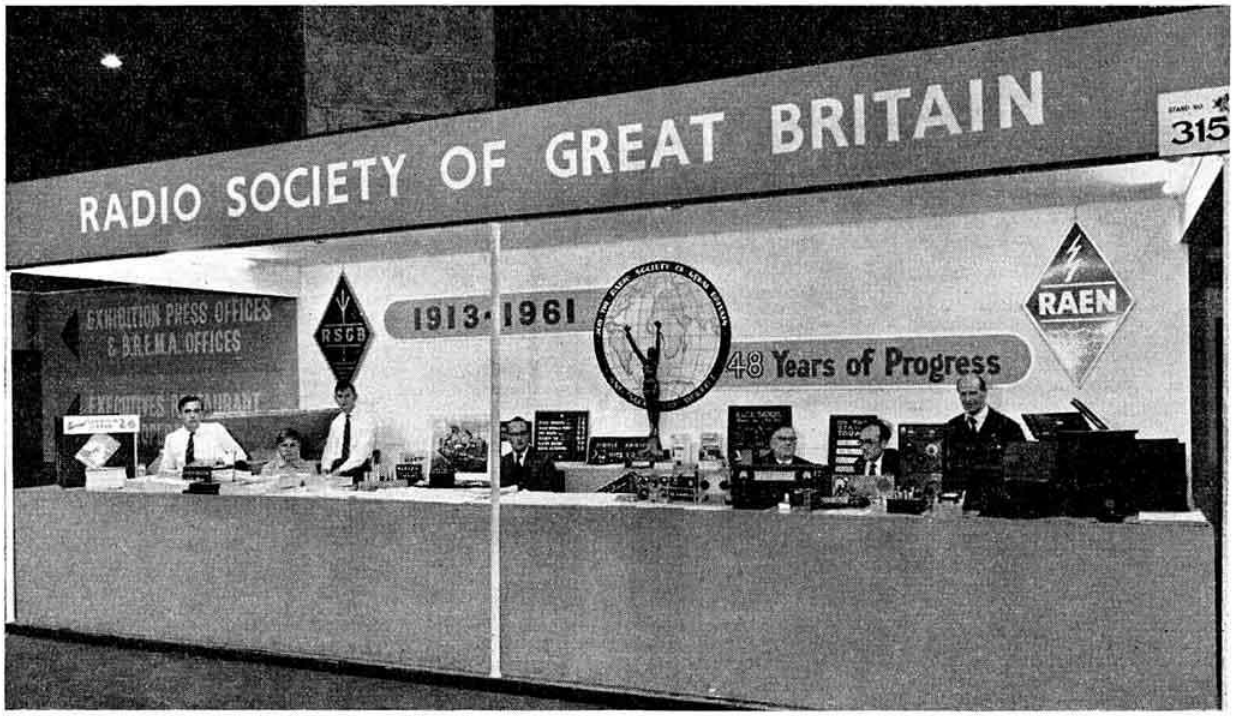
As regard the term " second-comer " the official interpretation of this states: " what we have in mind is that where an amateur *re-sites* his aerial and thereby causes interference due to close coupling with an existing aerial, we expect him to move his aerial if, by so doing, clearance of the interference can be simplified. Similarly, if a television owner puts his aerial close to an existing amateur aerial and then complains of interference we advise him to re-site his aerial."

Regarding restrictions being placed on the erection of outside aerials it is officially confirmed that this would be taken into account in determining the best method of eliminating the interference.

For the most part the new policy is designed to encourage good radio practice in station layouts thereby avoiding, as far as is humanly practicable, close coupling between amateur transmitting aerials and broadcast aerials. The supplementary problem of avoiding radio frequencies being induced into electricity supply cables is most important in the case of indoor or loft aerials. The presence of high radio frequency voltages, especially on transmitting aerials resonant in the l.f. amateur bands, is often overlooked.

Yours faithfully,

London, S.E.25. DAVID DEACON (G3BCM),
Chairman R.S.G.B. TVI/BCI Committee.



The Society's stand at the National Radio and Television Show, Earls Court, London, from August 23 to September 2, 1961 was again a great success, a large number of new members being recruited. Exhibits on the stand reflected the changes in radio equipment over the years. *(Photo by Terence Wilson and Partners Ltd.)*

Forthcoming Events

Details for inclusion in this feature should be sent to the appropriate Regional Representatives by the 18th of the month preceding publication. T.R.s and club secretaries are reminded that the information submitted must include the date, time and venue of the meeting and, whenever possible, details of the lecture or other event being arranged. Regional Representatives are requested to set out the copy, preferably typed double spaced, in the style used below. Standing instructions for more than three months ahead cannot be accepted.

DATES FOR YOUR DIARY

September 16.—Region 10 O.R.M. at Cardiff.
September 17.—Lincoln Mobile Rally and Hamfest.
October 1.—Region 17 O.R.M. at Newbury.
October 8.—Region 6 O.R.M. at Cheltenham.
October 21-22.—Scout Jamboree-on-the-Air.
November 22-25.—R.S.G.B. International Radio Hobbies Exhibition, London.
December 16.—A.G.M., London.
May 6, 1962.—South Eastern Counties Mobile Rally.

REGION 1

Ainsdale (A.R.C.).—Wednesdays, 8 p.m., 37 Hawthorne Grove, Southport.
Blackburn.—Fridays, 8 p.m., West View Hotel, Revidge Road.
Blackpool (B. & F.A.R.S.).—Tuesdays, 8 p.m. Squires Gate Holiday Camp.
Bury (B.R.S.).—October 10 (" Conversion of Surplus Equipment" by G3MAX), 8 p.m., Knowsley Hotel, Kay Gardens.
Chester.—Tuesdays, 8 p.m., Y.M.C.A.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., Gladstone Mission Hall, Queens Drive, Stoneycroft.
Macclesfield.—September 19, October 3, 17, 31, 42 Jordongate.
Manchester (M. & D.A.R.S.).—Wednesdays, 7.30 p.m., King George VI Club, North Road, Moston, 10. **(S.M.R.C.).**—Fridays, 7.30 p.m., Fallowfield Bowling and Lawn Tennis Club, 81 Wellington Road, Fallowfield 14.
Morecambe.—October 4, 125 Regent Road.
Preston.—September 26, October 10, 24, St. Paul's School, Pole Street.
Southport (S.R.S.).—Thursdays, 8 p.m., The Esplanade.
Stockport (S.R.S.).—September 27, October 11, 25, The Blossoms Hotel, Buxton Road.
Wirral (W.A.R.S.).—September 20, October 4, 18, 7.45 p.m., 15 Balls Road, Claughton, Birkenhead.

REGION 2

Barnsley.—September 22 (" First Weeks on the Air "), October 13 (Recorded lecture on Aerials by F. Chapman, B.E.M., G6CJ), 7.30 p.m., King George Hotel, Peel Street.
Bradford (B.R.S.).—September 22, 7.30 p.m., 66 Little Horton Lane.
Halifax (Northern Heights A.R.C.).—October 4 (" Two Metres " by G8CB), October 18 (Informal), 7.30 p.m., Sportsman Inn, Ogden.
Scarborough (S.A.R.S.).—Thursdays, 7.30 p.m., Chapmans Yard, North Street, Scarborough.
Sheffield (S.A.R.C.).—October 11 (" High Power Transmitters " by Dr. Kaiser), Dog and Partridge Hotel, Trippett Lane, Sheffield 1.

REGION 3

Birmingham (M.A.R.S.).—September 17 (M.A.R.S./C.A.R.S. Contest). September 19 (A.G.M.), October 5 (" Flying Spot Scanners "—TV Group), Midland Institute. October 7, Annual Dinner at Roebuck Inn, Erdington. **(Slade).**—September 16, Annual Dinner at Roebuck Inn; September 22 (" How far can radio signals be heard " by C. S. Bull of British Assn. for Advancement of Science), 7.45 p.m., September 29 (Whist Drive), 7.30 p.m., The Church House, High St., Erdington. **(South).**—September 21, 7.30 p.m. (" Two Metres "), Friends' Institute, 220 Mosley Rd., Birmingham.
Sutton Coldfield.—September 28 (Society Transmitter and Receiver), October 12 (Preparations for J.o.T.A. 1961), 7.30 p.m., 92 The Parade, Sutton Coldfield.
Stourbridge.—October 3, 7.45 p.m., Foley College, Hagley Road, Stourbridge.

REGION 4

Derby (D.A.D.A.R.S.).—September 20 (" Map Reading—an aid to D/F "), September 24 (Direction Finding Contest—President's Trophy), September 27 (Open Night), October 4 (Surplus Sale), October 11 (History and Development of the Electric Storage Battery by J. B. Naylor), October 18 (Host to W6QWX), 7.30 p.m., Room No. 4, 119 Green Lane, Derby. **(D.S.W.Exp. Soc.)** Fridays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, Derby.
Grantham (G. & D.A.R.S.).—Mondays, 7.30 p.m., Club Rooms (rear of Manners Arms), London Road, Grantham.
Grimsby (A.R.S.).—Alternate Thursdays, 8 p.m., R.A.F.A. Headquarters, Abbey Drive West, Grimsby.
Leicester (L.R.S.).—Mondays, 7.30 p.m., Club Rooms, Old Hall Farm, Braunstone Lane, Leicester.
Nottingham (A.R.C.N.).—Tuesdays and Thursdays, 7.30 p.m., Community Centre, Woodthorpe House, Mansfield Road, Sherwood, Nottingham.
Lincoln (L.S.W.C.).—September 17 (Mobile Rally and Hamfest), North Kesteven Grammar School, Newark Road, North Hykham.
Northampton (N.S.W.C.).—Thursdays, 7 p.m., Allen's Pram Works, 8 Duke Street, Northampton.
Peterborough (P. & D.A.R.S.).—October 6 (Aerials), November 3 (A.G.M.), 7.30 p.m., Peterborough Technical College.
Retford & Worksop (N.N.R.C.).—Tuesdays and Thursdays, 7.30 p.m., Club Rooms, Victoria Street, Worksop.

REGION 5

March (M.A.D.R.A.S.).—Tuesdays, 7.30 p.m., Club Room, Police Headquarters, March.

REGION 6

Cheltenham.—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street.
Stroud.—Wednesdays, 8 p.m., Subscription Rooms, Stroud.
Wolverton (W.D.R.C.).—Fridays, 7.30 p.m., Science and Arts Institute, Church Street.

REGION 7

Acton, Brentford and Chiswick.—September 19 (" Transmitter—New Design " by G3JEA), 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick.
Barnet (B. & D.R.C.).—September 26 (A.G.M.), 8 p.m., Red Lion Hotel, Barnet.
Bexleyheath (N.K.R.S.).—September 28 (Junk Sale), 8 p.m., Congregational Hall, Bexleyheath, (nr. Clock Tower).
Croydon (S.R.C.C.).—October 10, 7.30 p.m., " Blacksmith Arms," South End, Croydon.
Dorking (D. and D.R.S.)—Second and fourth Tuesday each month, 8 p.m., Star and Garter Hotel, Dorking.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway, W.5.
East Ham.—Tuesday, September 19, and fortnightly, 8 p.m., 12 Leigh Road, East Ham.
East Molesey (T.V.A.R.T.S.).—October 4, 8 p.m., Carnarvon Castle Hotel, Hampton Court.

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at 12.30 p.m. on Friday, September 15, October 19 and November 17, 1961

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

Enfield.—September 28, 7.30 p.m., (Lecture by Avo Ltd.), George Spicer School, Southbury Road.
Harlow and District.—Tuesdays, 7.30 p.m., rear of G3ERN (G. E. Read), High Street, Harlow.
Holloway (G.R.S.).—Mondays, Tuesdays and Wednesdays (R.A.E. and Morse), 7 p.m., Fridays (Club), 7.30 p.m., Montem School, Hornsey Road, Holloway N.7.
Ilford.—Thursdays, 8 p.m., 579 High Road, Ilford (near Seven Kings Station).
Kingston.—Lectures alternate Thursdays, Theory and Morse Classes weekly, 7.45 p.m., Y.M.C.A., Eden Street, Kingston (Morse at 2 Sunray Avenue, Tolworth).
Mitcham (M. & D.R.S.).—Lectures alternate Fridays at 8 p.m., Morse Classes at 7 p.m., September 22 (" V.H.F. Equipment " by T. Withers, G3HGE), The Cannons, Madeira Road, Mitcham.
New Cross (C.A.R.S.).—Fridays, 7.30 p.m., Sundays 11.30 a.m., Wednesdays (Morse Practice) September 22 (" Astronomy " by G3JJC), 8 p.m., 225 New Cross Road, London, S.E.14.
Norwood and South London (C.P. & D.R.C.).—September 16 (" Problems of TVI and BCI," by David Deacon, G3BCM), 8 p.m., Windermere House Annexe, Westow Street, Crystal Palace. October 3, Morse Class at G3IIR.
Paddington (P. and D.A.R.S.).—Wednesdays, 7.30 p.m., Beauchamp Lodge, 2 Warwick Crescent, W.2.
Romford (R. & D.R.S.).—Tuesdays, 8.15 p.m., R.A.F.A. House, 18 Carlton Road, Romford.
Southgate and Finchley.—October 12 (Grand Junk Sale), 8 p.m., Arnos School, Wilmer Way, N.11.
Sutton and Cheam (S. & C.R.S.).—September 19 (" Something of Interest " by John Brodzky, G3HQX), The Harrow, High Street, Cheam.
Welwyn Garden City.—October 12 (" The Murphy Television Camera " by Peter Kidd, G6FL), 8 p.m., Conference Room, Murphy Radio Ltd., Bessemer Road.

REGION 8

Crawley (C.A.R.C.).—September 27 (" Birdcages and Quads " by G. A. Bird, G4ZU), 8 p.m., West Green Centre. October 11, informal, for details contact G3FRV.
Tunbridge Wells (W.K.A.R.C.).—September 22 (" Modern Developments in TV Receivers " by H. F. Richards), October 6 (Informal), October 20 (Junk Sale), 7.30 p.m., Culverden House, Culverden Park Road.

REGION 9

Bath.—October 9, 7.30 p.m., Committee Room, Bath Technical College, Lr. Borough Walls, Bath.
Bideford.—First Thursday in each month, 7.30 p.m., alternately at T. G. Ward (G2FKO), 38 Clovelly Road (phone Bideford 964), and D. H. Jones (G3BO), Rosebank, Westcombe (phone Bideford 550).
Bristol.—September 15, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol 1.
Exeter.—Second Thursday in each month, 8 p.m., Y.M.C.A., St. David's Hill, Exeter.
Falmouth (F.R.C.).—First Wednesday in each month, Y.M.C.A., Falmouth.
Plymouth (P.R.C.).—Tuesdays, 7.30 p.m. Virginia House Settlement, St. Andrew's Cross, Plymouth.
Torquay (T.A.R.S.).—Second Saturday in each month, 7.30 p.m. (September, Mullard Films), Y.M.C.A., The Castle, Torquay.
Weston-super-Mare.—First Tuesday in each month, 7.15 p.m., Technical College, Lower Church Road, Weston-super-Mare.
Yeovil (Y.A.R.C.).—Wednesdays, 7.30 p.m., Grove House, Preston Road, Yeovil.

REGION 10

Cardiff.—October 9, 7.30 p.m. (A.G.M. and

recorded lecture on " Amateur Radio in the Antarctic "), T.A. Centre, Park Street, Cardiff. (Morse Class from 7 p.m.).

Penarth.—Last Monday in each month, 7.30 p.m., R.A.F.A. Club, Windsor Road, Penarth.

REGION 14

Glasgow.—Second Friday in each month, 7.30 p.m., Woodside Halls, Clarendon Street, N.W. (near St. George's Cross Underground).

Motherwell.—Third Friday in each month, 7.30 p.m., Carfin Hall, Motherwell.

REGION 16

Chelmsford.—First Tuesday in each month, 7.30 p.m., Marconi College, Arbour Lane.

REGION 17

Gosport (G. & D.A.R.C.).—Mondays, 7.30 p.m., Community Centre, Bury House, Bury Road.

Southampton.—Second Saturday in each month, 7 p.m., Engineering Lecture Theatre, Lanchester Building, University of Southampton, University Road, Southampton.

Regional and Club News

Basingstoke.—Response to the proposal to form an Amateur Radio Group in the area has been very encouraging and the first informal meeting was due to be held on August 30. Further information may be obtained from P. J. Sterry (G3CBU), Ashley, Orchard Road, Basingstoke.

Bristol.—Nearly 50 members and visitors were present at the August meeting when Richard Prior (G3MTG) gave a most entertaining lecture on transistors and their amateur applications. A transistor Top Band transmitter and modulator were amongst the items exhibited. *Hon. Secretary:* R. L. Shaddick (B.R.S. 19727), 2 Shanklin Drive, Filton, Bristol.

Civil Service Radio Society.—At the meeting at the Science Museum, South Kensington, on October 3 at 6 p.m. F. C. Judd (G2BCX) will be lecturing on Tape Recording and Musique Concrete, with demonstrations. On October 17, there will be a R.S.G.B. recorded lecture on " Interplanetary Travel " by W. A. Scarr (G2WS). Visitors will be most welcome but should telephone Mr. Voller (G3JUL) at Kensington 6371 prior to the meeting.

Clifton Amateur Radio Society.—Seven stations took part in the society's portable transmitting contest on July 23, using all bands from 1·8 to 21 Mc/s. In the nocturnal D/F Contest on August 5-6, four teams were successful in locating the hidden transmitter, G3OGE/P on 3·5 Mc/s. *Acting Hon. Secretary:* E. Godsmark (G3IWL), 211 Manwood Road, Crofton Park, London, S.E.4.

Cornish Radio and Television Club.—At the August meeting G3XC described and demonstrated a complete 144 Mc/s station and two films from the Shell library were shown. Details of forthcoming meetings may be obtained from the *Hon. Secretary:* W. J. Gilbert, 7 Poltair Road, Penryn, Cornwall.

Crawley Amateur Radio Club.—On September 27, the winter programme will commence with a lecture by " Dicky " Bird (G4ZU) on " Birdcages and Quads." A constructional contest for the " 1961 Committee Cup " is being arranged and judging will take place early in 1962. *Hon. Secretary:* R. G. B. Vaughan (G3FRV), 9 Hawkins Road, Tilgate, Crawley, Sussex.

Crystal Palace and District Radio Club.—Recent activities have included a V.H.F. evening at which Norman Ross (G3LAR) was the speaker, a trip to the Stamford Rallyfest and participation in the National Mobile Rally. On September 16, the meeting will be devoted to hi-fi. *Hon. Secretary:* G. M. C. Stone (G3FZL), 10 Liphook Crescent, London, S.E.23.

East Kent Radio Society.—The A.G.M. is due to take place on September 26. G3KFW has recently returned from a tour of North America and will be giving a talk on his experiences shortly. A party is being arranged to visit the R.S.G.B. Radio Hobbies Exhibition in November. *Hon. Secretary:* D. Williams (G3MDO), Seletar, New House Lane, Canterbury, Kent.

Gosport and District Amateur Radio Club.—This newly-formed club meets every Monday at 7.30 p.m. at the Community Centre, Bury House, Bury Road, Gosport. A varied programme has been drawn up to cater for most interests and aspects of Amateur Radio. A simple constructional course, Morse instruction and lectures are planned. Prospective members and visitors will be most welcome at meetings. *Hon. Secretary:* D. J. Gilbert (G3OYL), 45 Queens Road, Gosport.

Leeds Amateur Radio Society.—The first meeting of the new session will be held at 4 Woodhouse Square on September 20 when there will be an informal exhibition of members' equipment. Other arrangements include a demonstration of 4m equipment on September 27 and a Junk Sale on October 4. *Hon. Secretary:* D. Dinsdale, 69 Spen Lane, Leeds 16.

Magnus Grammar School (Newark) Radio Society.—Lectures on a wide variety of subjects have been given during recent months while a visit to Ericsson's Telephones was a highlight. A R.A.E. course is being run and it is hoped to have a complete station on the air early in 1962 using the call-sign G3PAW. *Hon. Secretary:* J. Baxter, 79 Newton Street, Newark, Staffs.

Mitcham and District Radio Society.—Tom Withers (G3HGE) is to give a talk on " V.H.F. Equipment " at the meeting at " The Canons," Madeira Road, Mitcham, on September 22. From October 6, meetings will be held fortnightly, Morse instruction commencing at 7 p.m. and lectures at 8 p.m. The club net on Top Band and 2m will be held on alternate Fridays starting October 13. *Hon. Secretary:* M. Pharaoh (G3LCH), 1 Madeira Road, Mitcham.

Northern Heights Amateur Radio Society.—A Junk Sale is to be held on September 20 in aid of the fund to provide a receiver for one of the residents of the Kenmore Cheshire Home, Cleckheaton. On October 4, G8CB will give a talk on 144 Mc/s equipment while October 18 will be informal. Meetings are held at the Sportsman Inn, Ogden, and commence at 7.45 p.m. *Hon. Secretary:* A. Robinson (G3MDW), Candy Cabin, Ogden, Halifax.

Reading Amateur Radio Club.—At the meeting at the Palmers Hall, West Street, on September 30, at 7.30 p.m., G5TP will demonstrate and describe his G2DAF-type s.s.b. transmitter. The October meeting has been brought forward to the 21st at the same time and place. A course in preparations for the R.A.E. will again be held at the E. P. Collier Evening Institute provided there are sufficient candidates. *Hon. Secretary:* R. G. Nash (G3EJA), 9 Holybrook Road, Reading.

Reigate Amateur Transmitting Society.—Recent activities have included operation of G3FM/A at the Fuller's Earth Union Fete in July, and a talk on Amateur Radio in France by Philippe Darroze (REF-11.829). The annual sale of surplus equipment will be held at the Tower, Redhill, on September 16 at 7.30 p.m. *Hon. Secretary:* F. D. Thom (G3NKT), 12 Willow Road, Redhill.

Stockport Radio Society.—A course in preparation for the R.A.E. is to be held at the Avondale Evening Institute and details may be obtained from G3FYE. On September 27, G3AYT is to give a talk on resistors while " s.s.b." will be the subject on October 11. Meetings are held at the Blossoms Hotel, Buxton Road, Stockport, at 8 p.m. on alternate Wednesdays. *Hon. Secretary:* G. R. Phillips (G3FYE), 7 Germans Buildings, Buxton Road, Stockport.

Tees-side Amateur Radio Club.—The Annual Dinner is to be held this year at the Corporation Hotel, Corporation Road, Middlesbrough, and both local amateurs and those outside the Tees-side area will be most welcome. Tickets, price 17s. 6d. for the five-course dinner, may be obtained from G3JMO. Overnight accommodation can be arranged for those requiring it. Meetings are held fortnightly at Settlement House, 132 Newport Road, Middlesbrough, on Fridays at 8 p.m., the next being on September 22. Shortwave listeners and newcomers to the hobby are always welcome. *Hon. Secretary:* Allan L. Taylor (G3JMO), 12 Endsleigh Drive, Acklam, Middlesbrough.

International Ham-Hop Club

INTERNATIONAL friendship through ham-hopping is catching on all over the world—even in the U.S.S.R.—and 1961 has seen the greatest activity so far. Already plans are afoot to adapt the administration to enable it to cope with the further increase inevitable in 1962.

What must prove to be a hard to beat record ham-hop was that of Ben Pooley (VK5BP) whose route took him to VK6 via ZL and then on to ZS before landing him in England where he now holds the call-sign G3PAH.

Southern Television recently featured I.H.H.C. when a seven

minute film was shown in the *Day-by-Day* series. The Club appreciates the help given by members all over the world who stood by on sked, thus ensuring the success of a difficult venture.

The daily 40m phone net has suffered due to prevailing long skip conditions but an alternative net on 3·7 Mc/s a.m. phone is building up. This takes place daily, except Saturdays and Sundays, at 17.00 G.M.T.

Prospective new members are warned that it takes time to organize a ham-hop holiday and adequate notice must be given well ahead of the proposed departure date.

The Hon. General Secretary of the Club is G. A. Partridge (G3CED), 17 Ethel Road, Broadstairs, Kent. G. A. P.

Representation

THE following are alterations to the list of Town Representatives published in the December 1959 issue.

REGION 7—LONDON EAST

CHINGFORD
R. H. Smart (G3MMC), 7 Brook Gardens, E.4.

EAST HAM
H. E. W. Reeve (G3JXZ), 284a Barking Road, London, E.6.

LOUGHTON AND DISTRICT
C. Waterman (G3NKX), 46 Danbury Road, Loughton, Essex.

REGION 16—ESSEX

DANBURY
E. J. O. Cole (G3IIS), 320 Springfield Road, Chelmsford, Essex.

Monmouthshire Conference Station

ON September 23, 1961, from 15.00–17.00 G.M.T. members of Blackwood Amateur Radio Society will be operating GW3KYA/A on all bands from 1·8 to 28 Mc/s from the Monmouthshire Ranger and Rover Conference at the Blackwood Secondary Modern School. Contacts will be appreciated, particularly with amateurs connected with the Scout and Guide Movement.

Southend Party

MORE than 100 members and their ladies attended a party in Southend on July 22, 1961, organized by Mr. W. E. Nutton (G6NU) of Gillingham, Kent. Among the 70 licence holders present were two sightless amateurs (G3IWC and G3OTB) and two lady amateurs (G3IYL and G3MER).

"Uncle" records his thanks to all who supported his party.

Fifty Years of Radio

AS part of the celebrations to mark the formation of the Derby Wireless Club in 1911, the successors of that Club —the present Derby & District Amateur Radio Society—have issued a booklet entitled *Fifty Years of Radio*. This traces the history of radio in Derby over the past 50 years and gives much interesting information about the original Derby Club, the Derby R.S.G.B. Group and the present Derby Society.

Copies of the booklet can be obtained price 2s. 6d. each from the Hon. Secretary of the D. & D.A.R.S., Mr. F. C. Ward (G2CVV), 5 Uplands Avenue, Littleover, Derby.

Popular Wireless

MR. B. B. WILSON (G3LXG), 45 Rockliffe Road, Linthorpe, Middlesbrough, has for disposal *Popular Wireless*, Vol. 1, Nos. 1-19 inclusive, published in 1922.

Held Over

DUE to pressure on space, a number of *Letters to the Editor* and other technical and topical features have been held over.

SOUTHERN REGIONAL MEETING
ELLIOTTS OF NEWBURY LTD., WEST STREET, NEWBURY
Sunday, October 1, 1961

Programme:

Assemble	**2 p.m.**
Business Meeting ...	**2.30 p.m.**
High Tea	**4.30 p.m.**
Raffle	**5.30 p.m.**
Informal Discussion ...	**6 p.m.**

Talk-in Stations

G3MWB on 1·8 Mc/s G3OUC on 144 Mc/s from 1 p.m.

The Council will be represented by Major-General E. S. Cole, C.B., C.B.E., G2EC (President), Mr. F. A. Russell, G3BHS (Zone D Representative) and Mr. G. M. C. Stone, G3FZL.

Tickets, price 8s. each, may be obtained from J. Gale (G3LLK), "Wild Hedges," Crookham Common, near Newbury, or from E. Smith (G3JMT), 26 Haddon Drive, Woodley, Reading.

SOUTH CENTRAL REGIONAL MEETING
BELLE VUE HOTEL, CHELTENHAM
Sunday, October 8, 1961

The Council will be represented by Messrs. A. O. Milne, G2MI, J. Douglas Kay, G3AAE, and F. A. Russell, G3BHS (Zone D Representative).

Tickets, price 21s., including lunch and buffet tea or 10s. 6d. with buffet tea only, may be obtained from J. J. Yeend (G3CGD), 30 St. Lukes Road, Cheltenham.

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EDDYSTONE 680X, 480 kc/s-30 Mc/s £85
EDDYSTONE 888, bandspread receiver £75
R.C.A. AR88D, 540 kc/s-32 Mc/s £65
GELOSO G209, Bandspread Receiver £65
R.C.A. AR88LF, 75-550 kc/s and 1·5-30 Mc/s £60
EDDYSTONE 750, 480-1, 450 kc/s and 1·7-32 Mc/s, double superhet £58
HALLICRAFTERS SX28, 550 kc/s-43 Mc/s £50
HALLICRAFTERS S36, U.H.F. AM/FM, 28-143 Mc/s £50
HAMMARLUND BC-794-B, 1250 kc/s-40 Mc/s, with power unit £50
MINIMITTER MR44 bandspread receiver £47
EDDYSTONE 840A, 480 kc/s-30 Mc/s £40
MINIMITTER MR37, bandspread receiver £40
HAMMARLUND Super Pro, with power unit £35
R.C.A. AR77E, 540 kc/s-31 Mc/s £32
EDDYSTONE 740, 540 kc/s-30 Mc/s £30
NATIONAL NC120, 540 kc/s-30 Mc/s £30
EDDYSTONE 870A, 150-380 kc/s and 510 kc/s-24 mc/s £28
BC-342-N, 1·5-18 Mc/s £25
R.M.E. 69, 550 kc/s-32 Mc/s £25
MARCONI CR100, 60-420 kc/s and 500 kc/s-30 Mc/s, with noise limiter £25
HALLICRAFTERS SKYRIDER 23, 540 kc/s-34 Mc/s £25
EDDYSTONE S640, 1·8-30 Mc/s £25
HALLICRAFTERS S20R, 550 kc/s-44 Mc/s £23
HALLICRAFTERS SX24, 550 kc/s-42 Mc/s £23
HALLICRAFTERS S38C, A.C./D.C., 550 kc/s-30 Mc/s £23
EDDYSTONE 358X, 9 coils, p.u., 90 kc/s-30 Mc/s £18
R.107, 1·2-18 Mc/s £14
Our list of H.R.O. Receivers, power units and coils available on request.
PANORAMIC ADAPTOR, Type RBW-2, 5·25 Mc/s input, for use with Hallicrafters S.27 and S.36, as new £50
MARCONI, Noise Generator, Type 987/1 ... ... £14
CLASS "D" WAVEMETER, complete £5
TWIN 100/1,000 kc/s crystal unit, as used in above 26/-
AVO ALL WAVE OSCILLATOR (Signal Generator) 95 kc/s-80 Mc/s £9 10 0

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