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DEVOTED TO THE SCIENCE AND ADVANCEMENT OF AMATEUR RADIO

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In this Issue

CURRENT COMMENT

THERE IS AN I.T.U. CONFERENCE COMING—

Are you on Two?

IN his Presidential Address Mr. Bartlett reminded members that an International Telecommunication Union Conference was due to be held within the next year or two. It would, needless to say, be of very direct and major interest to radio amateurs all over the world, whose activities and value seemed likely to come under close scrutiny on an international basis.

So far as British amateurs are concerned, the President made a number of suggestions which members will be able to read for themselves in his Address. It will be noted that among them was a very special reference to the importance of greater occupancy of our v.h.f. and u.h.f. allocations than appears to be the case at present.

Members who have given thought to this particular point will know that whereas the v.h.f. spectrum seems to be a "wide open space" compared with the noisy congestion on the lower frequencies, there is in fact a good deal of pressure upon it by a whole host of services, and would-be services, whose requirements can be met only by frequency allocations in these territories. "Going mobile," while new to the British amateur, is not by any means new to the police, ambulance, fire and other public services, whose active interest in mobile v.h.f. is apparent from the sprouting aerials to be seen upon most of their vehicles these days. And among private, commercial users of metre-wave radio there are already many thousands of taxis and trade vehicles using R/T in such a normal day-to-day way that its development in these fields is bound to be rapid. Aeronautical use of the v.h.f.'s, accelerated during the war, continues to demand large slices of this frequency region for intercommunication and navigational signalling.

Apart from these, yet another service that is a voracious consumer of bandwidth is television. Members' own reading of the public press will have disclosed the difficulty there has been of fitting the new Independent Television Authority into the 200 Mc/s Band 3, already heavily populated with non-video signals, suggesting that further flowering of vision in the higher u.h.f. region is inevitable and not far distant.

Many a sensible John Citizen will declare that much of the activity described in the preceding paragraphs is superfluous in the same way that a great deal of short-wave broadcasting, in his opinion, is also superfluous. Unfortunately, pious hopes win no megacycles, and without any doubt the most urgent thing to demonstrate where the v.h.f.'s are concerned is the use to which we as amateurs are putting the megacycles we have at the present time.

In this context, two things which may be said straightaway are these:

First of all, that sustained activity on the 2 metre band would be promoted if the deplorable habit of "coming on when conditions are good" were eradicated. Long-distance operation on 145 Mc/s is exceptional. The "natural" use of the band is for reasonably short-haul communication at comfortable levels of signal-to-noise. And arising from this we come—

Secondly, to the inescapable conclusion that a great deal of the operating that is done on the 160 metre band, and to a lesser extent on 80 metres, *should* and *could* be transferred to 2 metres. The suggestion has been made before on this page that the potentialities of the 2 metre band for net operation are well worth exploring, the technique being to employ a crystal-controlled common frequency and simple vertical aerials for local group working, leaving the more elaborate horizontally polarized directional arrays for out-county contacts (except in those rare cases where all the stations in a local group are so sited that they can hear one another without the need for aerial movement after each "over").

The force of these arguments impresses almost every member to whom they are put, but all too often the reply comes "Two metres is a difficult band on which to get going."

This misconception should be removed by the realization that a 2-valve converter and a simple 4 valve transmitter will "put you on the band." Members who have not yet tried "Two" may be ultimately convinced that the effort is worth making.

Finally, we might add that "ultimately" is hardly the adverb to use. What is wanted is greater occupancy of the 2 metre band now.

THERE IS AN I.T.U. CONFERENCE COMING—

The Things They Say—again

WHILE the foregoing may be regarded, if the reader so desires, as a piece of special pleading for the greater use of the v.h.f.'s, it represents only a part of the picture that will confront the Amateur Radio movement when the next I.T.U. Conference comes round. What we have written suggests that there should be greater occupancy of those metre-wave "frequencies of the future" than there is at present. But what of the already fully occupied lower frequencies, where too many amateurs crowd into too few kilocycles, amid (all too often) an unwanted obligato of "professionals"?

Without any doubt the lot of the amateur would be immeasurably improved if he could not only retain the h.f. allocations which he has at present, but could witness the removal of intruders and "sharers"—or at least feel that a state of "fair shares" existed.

His case for retention—indeed extension—of his frequency allocations must rest largely on the value set upon the Amateur Service by Authority. And here the amateur's performance will decide his own future. Should he be regarded as a worthwhile contributor to the radio art then he need have few fears about his future at the hands of International Conferences. But if the idea gets around, induced by the exhibitionist performances of the minority, that he is cluttering valuable frequencies with inconsequential chatter or futile contests then his future will be gloomy.

Mr. Bartlett has invited attention to this aspect of Amateur Radio, too. Our "Current Comment" did likewise a couple of months ago. Of the amateurs shall it be said "By their deeds shall they be known." Let not the sequel be "And the rest is silence."—*J.H.*

Modern Top Band Transmitter

By O. M. DERRICK (GM3OM)*

WHEN the writer became interested in Top Band work it was decided to build a special transmitter although it was known that many amateurs obtain excellent results with simple hook-ups or converted ex-Government equipment. It is considered that the requirements for this band are the same as for the higher frequencies: a T9 signal, ability to net on a signal without any frequency pulling when the p.a. is tuned, good frequency stability and break-in facilities. The transmitter described in this article has all these desirable characteristics.

The Circuit

The circuit adopted is shown in Fig. 1. The first stage (V1) employs a 6SN7GT double triode valve, one section being used as a series tuned Colpitts oscillator, which is cathode coupled to the other section acting as an untuned buffer-amplifier. The latter is in turn cathode coupled to V2 (6V6GT), a tuned buffer-amplifier stage in which the tuned circuit is fairly flat. The arrangement provides excellent isolation of the frequency control circuit from the later stages of the transmitter. In the p.a. stage an 807 is used, the top cap anode providing good isolation between the grid and anode circuits.

Keying of the transmitter takes place in the cathode of the v.f.o. and the circuit includes a simple but effective key filter which reduces any local interference, an essential in any transmitter. The netting switch—a d.p.d.t. toggle type mounted on the front panel—is arranged so that in the net position no h.t. is supplied to the screen of the 807, while at the same time, the key jack is shorted allowing netting of the v.f.o. and adjustment of the drive to the p.a. In the operate position the screen of the 807 is connected to the h.t. line and the short circuit on the key jack removed.

*261 Main Street, Larbert, Stirlingshire.

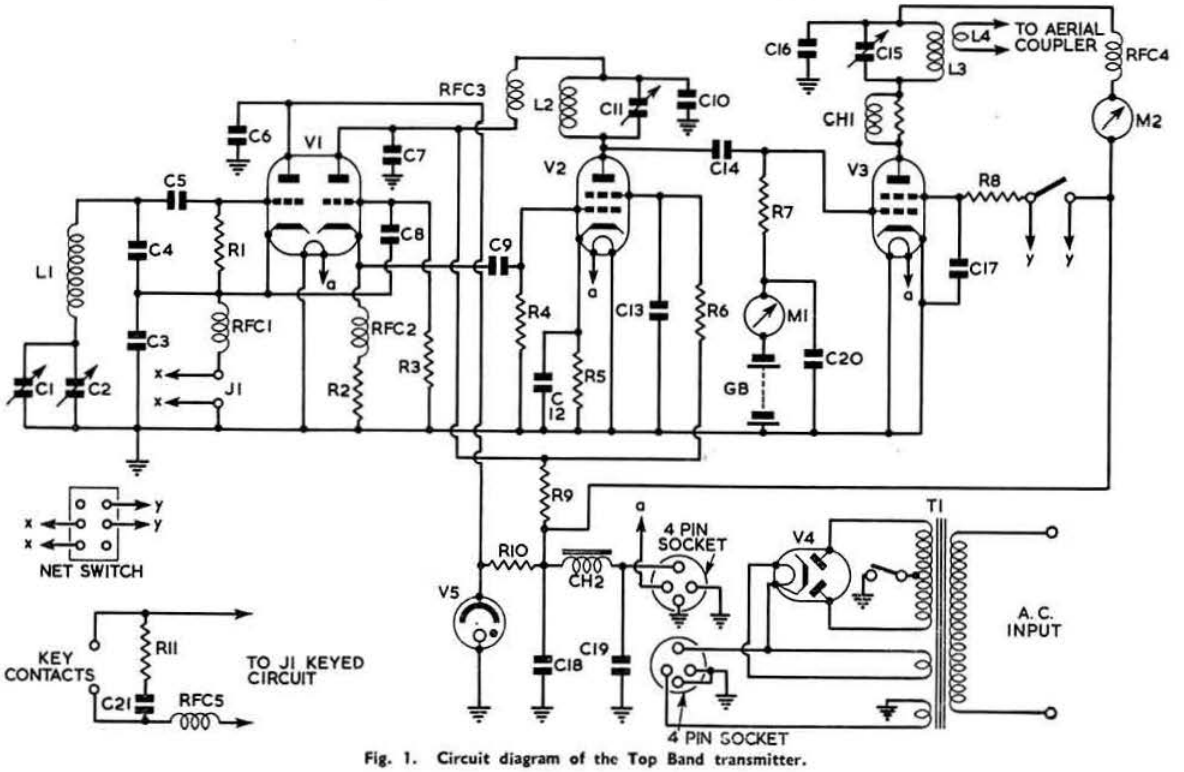


Fig. 1. Circuit diagram of the Top Band transmitter.

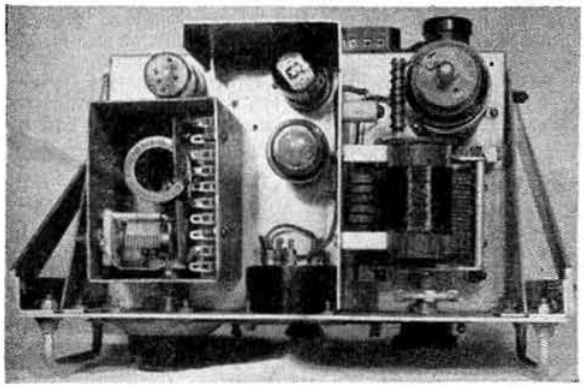
C1, 50 $\mu\mu$F midget type.
C2, 150 $\mu\mu$F midget type.
C3, 4, 16, 17, 0.001 μF mica.
C5, 8, 9, 14, 100 $\mu\mu$F mica.
C6, 7, 10, 20, 0.01 μF mica.
C11, 100 $\mu\mu$F midget type.
C12, 13, 0.01 μF paper.
C15, 250 $\mu\mu$F variable.
C18, 19, 8 μF, 500 V wkg.
C21, 0.1μF
CH1, 100 ohm 1 watt resistor with 8 turns 20 s.w.g. enam.
CH2, 15-20 H choke.
GB, Grid bias battery, small layer type, 45 volts.
J1, Key jack.
L1, L2, 64 turns, 22 s.w.g. enam., 1½ in. ribbed former.
L3, 32 turns, 20 s.w.g. enam., 1½ in. diam. ribbed former.
L4, 8 turns at "cold" end of L3.
M1, 0-5 mA m.c. meter.
M2, 0-50 mA m.c. meter.
R1, 3, 20,000 ohms ½ watt.
R2, 1000 ohms ½ watt.
R4, 33,000 ohms ½ watt.
R5, 470 ohms ½ watt.
R6 47,000 ohms 1 watt.
R7, 10,000 ohms ½ watt.
R8, 10,000 ohms 2 watt.
R9, 10,000 ohms 5 watt.
R10, 10,000 ohms 5 watt.
R11, 1500 ohms ½ watt.
RFC1, 2, 3, 4, 5, r.f. chokes.
T1, 350-0-350 V, 100 mA, 5 V 2A, 6.3 V 3 A.
V1, 6SN7GT.
V2, 6V6GT.
V3, 807.
V4, GZ32 or 5R4GY.
V5, VR150/30.

The grid current requirement of the p.a. is approximately 1 mA for an input of 10 watts.

Construction

Details of the general layout of the transmitter can be seen in the photographs. Two chassis, each 10in. x 6¼in. x 2in. with 12in. x 7in. front panels, are mounted on angle uprights to form a compact table top rack taking up little space on the operating table. The provision of handles on the upper chassis makes for easy handling.

As in any transmitter, the construction of the v.f.o. calls for care. The components, L1, C1, C2, C3 and C4, are mounted in a steel or heavy aluminium box 3in. x 4in. x 4in. which is bolted to the main chassis, the 6SN7GT being mounted outside at the rear. The band set condenser, C1, is a midget type, the spindle being cut short and slotted for adjustment with a screwdriver; it is mounted on the side of the box. C2, also a midget type, has its spindle brought out through the front panel to the vernier tuning control. With a capacity of 50 $\mu\mu$F, the Top Band just occupies full scale. Wiring of the v.f.o. components should be carried out with 12 s.w.g. copper wire.



Plan view of the Top Band transmitter. To the left is the v.f.o. box which contains L1, C1, C2, C3 and C4. V1 is at the rear of the chassis. In the rear centre is V2, and in the centre V5. The p.a. stage is to the right.

The following stages call for little comment, The tuned circuit of V2 is below chassis, while the p.a. stage components are above. It is important to use a screen around the lower half of the 807; as a precautionary measure an anti-parasitic choke is included in the anode circuit. The vertical screen on the upper side of the chassis is also used for supporting some of the p.a. anode circuit components. The coil formers for L1, L2 and L3 are all 1¼in. diameter ribbed type similar to Eddystone plug-in formers with the pins removed. L1 is mounted vertically and bolted through the v.f.o. box and chassis. L2 and L3 are mounted horizontally on small insulated pillars.

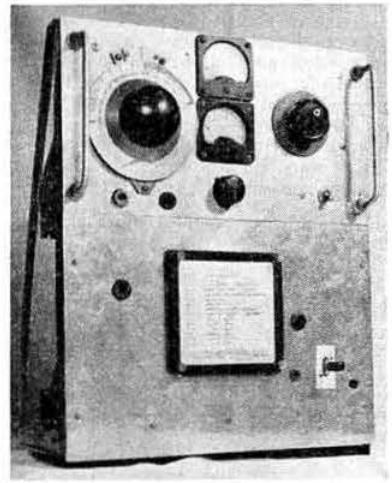
The power supply is built on the lower chassis. A combination of grid-leak and battery bias is used for the 807, the battery being one of the small layer built types. A battery was adopted with some hesitation but considering the limitations of the h.t. available greater efficiency can be gained from its use; it has proved perfectly satisfactory.

In order that the equipment may also be usable in connection with the local R.A.E.N. group, a simple plug and socket system is used so that the transmitter can derive power from a car battery and vibrator or rotary converter.

V.F.O. Calibration

The v.f.o. dial should be directly calibrated in kilocycles using a BC221 or other accurate frequency meter. A piece of art card cut to shape and glued to the dial and marked with the band edges in red serves admirably.

On the lower panel is mounted a frequency chart showing all the spot frequencies of shipping stations, as published in the R.S.G.B. BULLETIN, so providing a ready reference to the frequencies to be avoided within the band. A cover from a TU unit protects the chart.



Front view of the transmitter showing the mounting of the two panels. The v.f.o. dial is at the top left-hand side with the p.a. anode and grid current meters in the centre and the p.a. tuning control to the right. A chart showing the frequencies of coast radio stations is in the centre of the lower panel.

Operation on 3.5 Mc/s

If desired, a switch can be fitted to short out half the turns on L2 (centre tap to cold end) so that the tuned buffer stage can be used as a doubler with the p.a. tuned to 3.5 Mc/s. No alterations to the p.a. tank circuit are necessary as the inductance and capacity specified will resonate in the 3.5 Mc/s band near the minimum setting of the condenser.

Results

Results with this transmitter have been most satisfactory although the location of GM3OM is far from ideal, situated as it is in a hollow. The aerial system is a Marconi which slopes to within 12ft of the ground. So far stations in 90 British counties have been worked, including daylight QSOs of up to 300 miles. During last winter, contacts were made with ZC4, DL, OH, OK, HB. Listener reports were received from Sweden and Norway.

Television Interference

Although the interference problem to television receivers is not normally troublesome when using Top Band, the transmitter has been thoroughly tested for TVI. A number of different makes of television receiver were operated in the same room as the transmitter using indoor TV aerials. No interference was noted on either c.w. or phone. Further tests, carried out with a television receiver employing a 14 Mc/s i.f. stage installed in an adjacent house proved satisfactory, no interference being caused. Since then the transmitter has been in constant use both on Top Band and 3.5 Mc/s with no complaints.

CONSTRUCTIONAL ARTICLES ARE STILL WANTED

An Introduction to Amateur Transmitting

Part 2—The Power Amplifier

By LORIN KNIGHT, A.M.I.E.E. (G2DXK)*

IN all amateur work it is always advisable to use a low power master oscillator, as this ensures low heat dissipation and, in consequence, produces better frequency stability. With a crystal oscillator it also avoids any risk of fracturing the crystal. Because of this desirable condition the transmitter output must be brought up to the required power level by one or more radio-frequency power amplifiers. A typical circuit is shown in Fig. 6. In this arrangement the valve is a pentode or beam tetrode. For a 10 watt transmitter a normal receiving type such as a 6AQ5 will be satisfactory. But for a more powerful transmitter a special transmitting type such as an 807 or an 813 will be necessary.

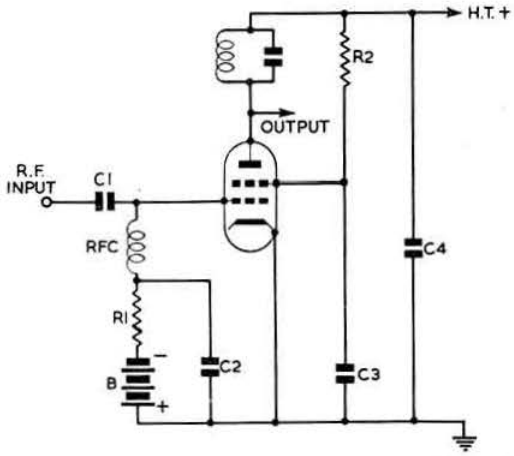


Fig. 6. A typical r.f. power amplifier. Values for an 807 would be 400 volts h.t.; B, 45 volts; C1, 0.001 μF; C2, 3, 4, 0.005 μF; R1, 10,000 ohms; R2, 30,000 ohms.

Class A, Class B and Class C

In order to appreciate fully the operation of a power amplifier we should look at the operating characteristic of a typical tetrode such as is shown in Fig. 7 (a). If the valve is operated under class A conditions the grid would be biassed to about —15 volts. Then, provided that its amplitude is not excessive, a sine-wave input voltage would produce a corresponding sine-wave anode current as shown in Fig. 7 (b).

If the grid bias were increased to —30 volts the anode current, with no r.f. input applied, would be practically zero and the bias would be said to be at the cut-off point. Under these conditions, when a sine-wave voltage is applied to the grid, anode current flows only for half of every cycle. We can now drive the grid positive for part of the cycle and obtain higher peaks of anode current for the same average anode current as we obtained in Fig. 7 (b). Greater efficiency has been achieved in the sense that more r.f. output power is being obtained for a given power consumption from the h.t. supply. It should be noted, however, that a much larger r.f. input power is required. Not only must the amplitude of the r.f. voltage be greater, but the grid will have a low resistance to earth when it is positive and power will be required to drive it above earth on the positive peaks. Used under these conditions the amplifier is said to be operating in class B.

If the grid bias is increased still further, say to about 2 or 3 times the cut-off value, the anode will conduct for considerably less than half a cycle, as shown in Fig. 7 (d). Under these conditions the grid can be driven even more positive before the average value of the anode current becomes excessive and an even greater r.f. output power can be obtained for a given h.t. input power. This fact makes class C operation, as it is called, particularly attractive for an amateur transmitter where the power limitation is imposed on the d.c. input to the anode of the final power amplifier.

Class B is, however, occasionally used in preference to class C, because it has the advantage that its output can be made to be directly proportional to the r.f. input. This, as we shall see later in the series, is extremely useful for single sideband transmission.

With a maximum input power of 150 watts a typical class C amplifier might give 110 watts of r.f. power. In class B the output would be less than 100 watts and in class A less than 50 watts.

Grid Bias

There are various ways of providing grid bias but that shown in Fig. 6 is one of the best for class C operation. The battery (or small power supply) B provides about 1½ times the cut-off voltage; the extra voltage required is produced by the r.f. input itself. For a

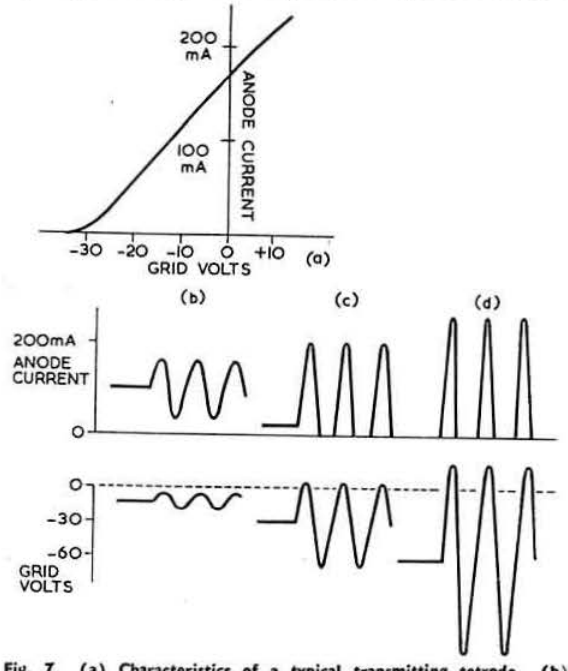


Fig. 7. (a) Characteristics of a typical transmitting tetrode. (b) Class A operation. (c) Class B operation. (d) Class C operation.

*28a Glebe Road, Letchworth, Herts.

short period every cycle, the grid is driven positive and during this time it draws electrons from the cathode. These then return to earth through the resistor R1 and the battery. The current flow through R1 is smoothed out by the capacitors C1 and C2 so that there is a steady voltage developed across R1 which provides the extra bias. Since this voltage is dependent on the r.f. excitation it is self-adjusting, becoming high for over-excitation and low for under-excitation.

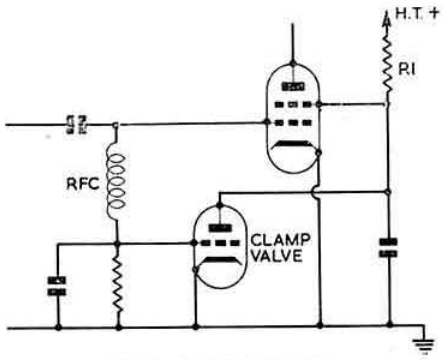


Fig. 8. Clamp valve circuit.

It is possible to dispense with the battery and use grid current bias entirely but this introduces the danger that if, for any reason, there is no excitation the bias will disappear and the valve will draw excessive anode current. A popular method of preventing this happening is to use a second valve—commonly called a clamp valve—to prevent excessive anode dissipation in the absence of drive by reducing the screen voltage of the p.a. valve to a low value. The arrangement is illustrated in Fig. 8. During normal operation the p.a. grid current bias causes the clamp valve to be cut off and to have no effect. Should the excitation fail, the grid of the clamp valve will rise to earth potential. The clamp valve will then conduct heavily and the resulting voltage drop across R1 will reduce the screen voltage of the tetrode, thus preventing the latter from taking excessive anode current.

The grid current of a power amplifier gives a very useful indication of the amplitude of the excitation being applied to the grid and thus it is common practice to make provision for connecting a d.c. milliammeter in series with the bottom of the grid resistor. It is a common belief amongst many amateurs that the higher the grid current the better the amplifier must be performing. This is true up to a point but there is no advantage in increasing the current beyond the figure recommended by the valve manufacturer; it will give no worth-while increase in efficiency and is quite liable, by overheating the grid and liberating gas, to have the reverse effect.

Interstage Coupling

It has been assumed so far that the anode of the driver valve would be tuned and would be capacitance coupled to the grid of the amplifier as shown in Fig. 9 (a). The capacitor C1 isolates the grid from the h.t. supply but provides a low impedance path for the transfer of r.f. energy from the driving anode. The r.f. choke RFC gives a d.c. path for the grid bias but its high r.f. impedance prevents it from absorbing any appreciable r.f. energy.

An alternative system which is very popular is that shown in Fig. 9 (b). In this arrangement the grid circuit also is tuned and is inductively coupled to the anode of the driver. One advantage of this method is that by suitably adjusting the coupling between the two coils it is possible to obtain a band-pass characteristic. This means that it is possible to obtain an efficient transfer of energy over the whole frequency range of one amateur band without any retuning being necessary.

A modified version of inductive coupling is the link coupling method shown in Fig. 9 (c). Here each coil has a small coupling winding, the two coupling windings being linked by a length of coaxial cable or twin p.v.c.-covered wire. An advantage of this method is that the two tuned circuits can be some distance apart.

Anode Current

It has already been shown that when r.f. excitation is applied to the grid the anode will take pulses of current. If the anode circuit is off-tune the reading given by a d.c. milliammeter connected in the h.t. supply to the anode will indicate a high current. If the anode circuit is tuned to resonance a large sine-wave voltage will appear across it. The phase of this voltage will be such that the anode potential will be very high when the grid is very negative and nearly zero when the grid is positive. In consequence, the average anode current will be very low.

If a load such as an aerial or a succeeding power amplifier is coupled to the anode circuit, energy will be drawn from the tuned circuit. This will damp the oscillatory current there and the r.f. voltage across the coil will fall. The anode will, consequently, be more positive at the instant the grid potential is high and more anode current will flow.

It is quite easy, therefore, to bring the anode circuit into resonance by tuning for minimum anode current. When an external load is coupled to the anode the increase in anode current will give an indication of the amount of energy being extracted. Ideally the effect of the external circuit should be the same as if a resistance had been introduced into the tuned circuit. In practice some capacitance or inductance may also be introduced and a slight readjustment of the tuning may be required to compensate for this condition.

If there is no load on the anode circuit it is inad-

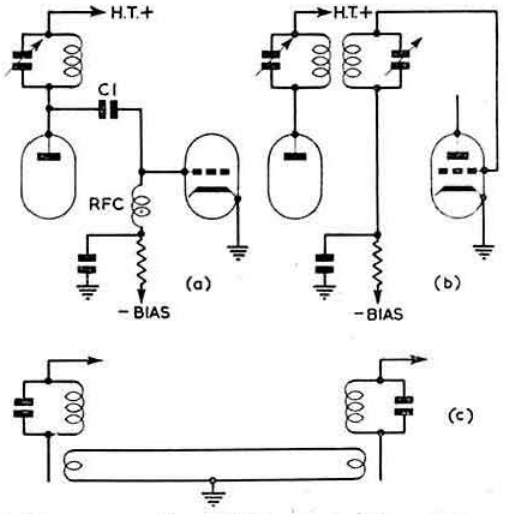


Fig. 9. Interstage coupling. (a) Capacitive coupling. (b) Inductive. (c) Link coupling.

visable to run an amplifier with full anode and screen voltages because of the high r.f. voltage which may be developed. Furthermore, because the anode potential will be so low during the time that the grid is positive most of the electrons from the cathode will flow to the screen and as a consequence the screen current may become excessive. When first adjusting a power amplifier the h.t. voltage should be reduced to at most 50 per cent of its normal value. With a tetrode it is sufficient to lower the screen voltage only.

When adjusting the anode circuit a useful indication of the presence of a r.f. voltage can be obtained by a small neon bulb. When held in the hand near a point of high r.f. potential the small r.f. current which passes through the capacitance of the air gap, *via* the neon and thence through the body to earth, is sufficient to make the neon glow.

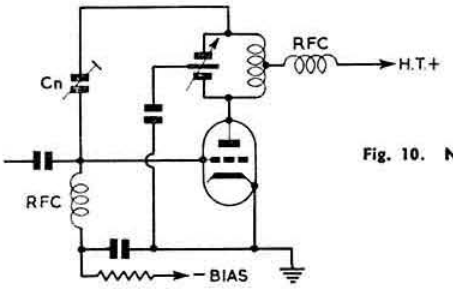


Fig. 10. Neutralization.

Feedback

It must not be forgotten that a power amplifier has its grid and anode circuits tuned to the same frequency and that stray coupling between the two may cause oscillation. Most power tetrodes designed for r.f. use have a top-cap anode and in such cases it is sound practice to mount all the anode circuit above and all the grid circuit beneath the chassis. It is advisable also to place an earthed cylindrical metal screen around the lower half of the valve to shield the grid assembly from the anode circuit. To prevent overheating of the valve, allowance should be made for air from beneath the chassis to pass up between the valve and the cylinder. All leads should be kept short and direct, earth connections for any one stage being taken to points on the chassis which are as close to each other as is practicable. On no account should a length of wire be used to serve as the common earth lead for the grid and anode circuits. Such a lead would have some inductance and the r.f. voltage developed across it by the anode circuit, although very small, might introduce sufficient feedback into the grid circuit to cause trouble.

On very high frequencies, with a poor transmitter layout or with tetrodes having very poor internal screening, the stray anode to grid capacitance may be high enough to cause undesirable interaction between the anode and grid circuits, if not actual oscillation. It will then be necessary to neutralize this capacitance. If, as was common some years ago, a triode is used, it will be essential to take this step.

Neutralizing

A popular neutralizing circuit is shown in Fig. 10. In this arrangement the anode coil is centre-tapped and tuned by a split-stator capacitor. The voltage at the upper end of the anode coil is 180° out of phase with the anode and the feedback through Cn can therefore be made to cancel out the anode-grid capacitance. The required value of Cn will be approximately equal to the anode-grid capacitance. With a triode this might be of the order of 5 $\mu\mu$F; with a tetrode it will be of the order of 0.1 $\mu\mu$F and will require nothing more than the suitable positioning of a short piece of stiff wire.

Neutralizing is adjusted with all h.t. removed from the amplifier. Grid excitation is applied and Cn set so that tuning the anode circuit through resonance produces no kick on the grid current meter.

Frequency Multipliers

The anode circuit can, of course, be tuned to a multiple of the excitation frequency. It will not then receive a driving pulse during every cycle of its resonant frequency but its own pendulum action will maintain a circulating sine-wave current. This arrangement is most commonly used to give twice or three times the input frequency. The amplifier is then said to be a doubler or a tripler and the output frequency the second or the third harmonic of the input frequency. Because the anode and grid are tuned to different frequencies there is less danger of feedback and no need for neutralization.

A frequency multiplier is less efficient than a straight r.f. amplifier and is generally only used as an intermediate stage between the master oscillator and the final power amplifier.

Since many of the amateur bands are harmonically related to each other it is possible to obtain outputs on a number of bands by using one master oscillator followed by different arrangements of frequency multipliers. The more ambitious transmitters, for example, often have a v.f.o. giving an output in the 3.5 Mc/s band followed by switchable frequency multipliers which enable the input to the final amplifier to be in the 3.5, 7, 14, 21 or 28 Mc/s bands.

(To be continued)

Pye Marine Equipment

EQUIPMENT designed for use in vessels of between 500 and 1600 tons has recently been made available by Pye Marine, Ltd. Named the "Swordfish," the new transmitter-receiver is crystal controlled on both send and receive. Eight channels are provided, any one of which may be selected by a single switch. The frequencies covered are: 2182 kc/s, 1600-2850 kc/s, 3500-3900 kc/s and 1600-3900 kc/s. The transmitter, rated at 50 watts output, uses 807s in the crystal oscillator, power amplifier and modulator stages. The receiver employs seven all-glass miniature valves.

For smaller vessels such as yachts and motor boats, the company has produced the "Dolphin" combined transmitter-receiver. The radiated power is 8-10 watts and eight crystal controlled channels are available in the frequency range 1520-3800 kc/s. The receiver also covers the medium wave broadcast band.

Simple Beam Rotating System

By G. I. TURNER (G3DGN)*

WHEN using a directional aerial of a size suitable for rotation, means are usually provided for turning the array to any desired direction. For all-round coverage this means turning through approximately 180° for a bi-directional aerial and 360° for a unidirectional one. Although not strictly essential, it is extremely useful to know in which direction the beam is pointing.

In the system to be described, both these requirements are catered for using only one control—an ordinary potentiometer. An additional, though optional, refinement is a speed control for the motor.

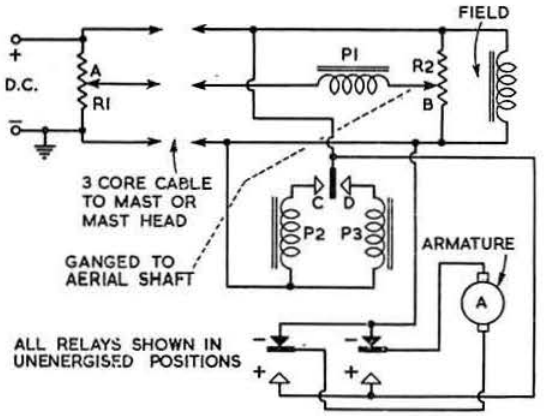


Fig. 1. Simplified circuit of the rotating system.

Method of Operation

In the functional diagram (Fig. 1), R1 and R2 are two similar potentiometers, though not necessarily the same value, which together form a bridge circuit. The polarized relay, P1, is such that when current passes through its coil in one direction one pair of contacts make and when the current is reversed, a second pair make. When no current passes through the coil, no contacts are made. This relay is the heart of the system and can either be bought or made as described later.

With the d.c. supply connected, consider the points A and B—the slider contacts on the potentiometers—to be in the centre of their respective resistive elements. The potentials at A and B will be equal and no current will therefore flow through P1; that is to say, the bridge is balanced. If R1, the control potentiometer, is then moved, say clockwise, the potential at A will differ from that at B and current will flow through P1. Contact C is then made, relay P2 operates and connects one end of the armature winding of the beam turning motor to the positive supply. As the field supply is switched on while the equipment is in operation (this is not essential but in practice it is a good plan, as the current used keeps the motor free from condensation, etc.) the motor turns, rotating the aerial through reduction gears in such a direction that B, which is driven by the aerial shaft, turns clockwise on R2. When the potential at B equals that at A, the current through P1 ceases and the armature is disconnected from the supply, so stopping the motor. Conversely, if A is moved anti-clockwise, contact D makes, P3 operates and the other end of the armature is connected to the positive supply. As the field connection is unchanged, the motor now turns in the reverse direction, turning the aerial and B anti-clockwise until balance is once more restored.

A scale is provided for R1, marked in compass points, so that in operation the pointer knob is simply turned to the required direction, whereupon the aerial turns until balance is again obtained.

Practical Circuit

The circuit of Fig. 1 will operate satisfactorily, given a suitable relay for P1. However, the final circuit arrangement depends very much on the supplies, relays and motor available. That shown in Fig. 2 which is for a 12-24 volt (a.c. mains and bridge rectifier) supply, a very sensitive polarized relay and a 24 volt shunt wound d.c. motor, has some useful refinements.

In deciding upon a practical arrangement, there are several points to be considered. The most important is that for 360° rotation the aerial shaft must be geared to R2. Simple model gears are suitable as negligible force is transmitted and a ratio of 2:3 is convenient as 240° of movement on the potentiometer (maximum rotation is about 270° as a rule) corresponds to 360° on the aerial. This allows a little overlap at each end; in fact, the aerial can be rotated through about 400° full circle + 40°. The gearing is repeated at the control end so that the compass points lie on a full scale. If no gearing is used at the control end, North, say, will appear at both ends of the scale (Fig. 3).

The polarized relay P1 can be made quite easily from an old moving coil meter of a few milliamps sensitivity, using contacts from a surplus relay, as shown in Fig. 4. Alternatively, suitable relays may be purchased. Relays P2 and P3 can be any type which will work off the motor supply and carry the armature current (about 1 amp.). Spark suppressing resistor-capacitor circuits should be connected across all relay contacts.

At G3DGN an ex-Government shunt type 24 volt motor (approximately one-thirtieth h.p.) is used for rotating a v.h.f. aerial but a second equipment is under construction using a bigger one (one-twelfth h.p., series wound, with magnetic brake) for a 14 Mc/s two element

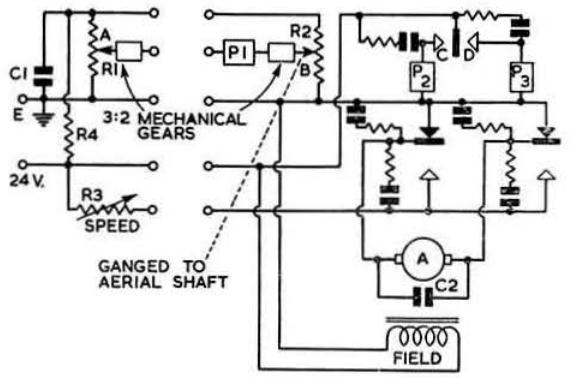


Fig. 2. Practical circuit of the rotating system. C1, 50 μF, 50 V electrolytic; C2, 0.1 μF; R1, 2500 ohms, 5 W, wirewound; R2, 2000 ohms, 5 watt, wirewound; R3, 40 ohms, 15 watt; R4, see text. The condensers and resistors in the spark suppressing circuits are 0.1 μF and 220 ohms, ½ watt, respectively.

*" Deegeen," Clifford Road, New Barnet, Herts.

beam. Weather-proofing of the motor should be thorough and back-lash in the gearing kept to a minimum. R3 in series with the armature supply provides a 3:1 variation in speed. R4 reduces the supply to the bridge circuit and its value depends mainly on the polarized relay P1.

Testing

When the equipment is complete, the following test sequence should be followed. With R4 disconnected, starting of the motor, when the armatures of P2 and P3 are pressed by hand, should be checked. Next, the speed control (R3) should be tested. Trouble in starting may be experienced if the supply impedance is too high. A 4 A battery charger has proved satisfactory with both motors tried but a smaller unit failed to start the larger motor although it would maintain rotation once started.

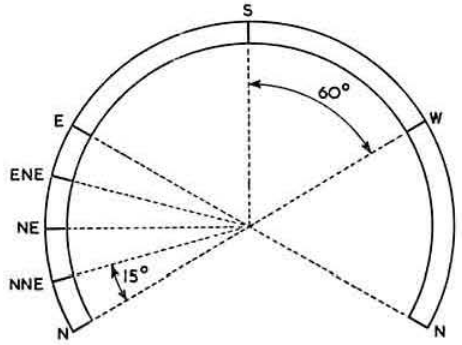


Fig. 3. Typical scale for R1 when ungeared.

After this has been done, R4 may be connected (try values between 20,000 ohms for a very sensitive relay and 100 ohms for an insensitive one) and A and B set about midway so that P1 does not operate. When A is turned a little off centre, P1 should operate either P2 or P3, so starting the motor and turning B in the same direction as A. If it moves in the opposite direction, connections C and D should be reversed. R4 may now be increased to the maximum value consistent with satisfactory operation (with too low a value the "detector" of the bridge can become too sensitive with the result that the system will be unstable, *i.e.*, hunt.).

Alignment is simple: set both R1 and R2 fully clockwise, turn the beam towards a known direction and set the pointer knob on R1 to the same direction on its scale. This completes the adjustments required.

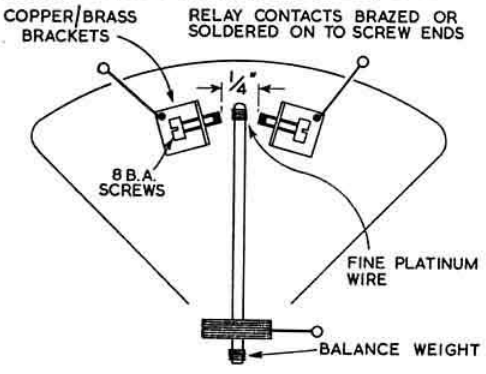


Fig. 4. Construction of a polarized relay using an ex-Government 0–5 mA meter movement.

Results

The equipment described will set to better than 5°, which is adequate for most beams. Some improvement can be obtained by using a motor with a magnetic brake. However, if P1 is kept in view at the control end, the direction in which the array is pointing can be read to at least 1° by adjusting A on R1 when the beam has stopped so that the moving contact on P1 is exactly half-way between the fixed contacts.

A suitable range for the speed of rotation has been found to be from 15 to 45 seconds for the full 360°.

General Notes

Although not strictly within the scope of this article, attention is drawn to the following points. If a heavy beam is used, strong gears are advised between the motor and the beam as the starting and stopping torque, due to the inertia of the array, may strip them if they are too light. The lathe type have been found suitable, while those from ex-Government I.F.F. equipment gear boxes are satisfactory for small v.h.f. arrays.

Some form of limit switch in case of failure of the control circuits may be advisable.

Pilot lamps can be fitted across P2 and P3 to indicate the direction of rotation.

* * *

The writer wishes to place on record his thanks to Messrs. Roy Grimmond, M.Sc., and Frank Armsby for their help with the motor circuits and mechanical details respectively.

LONDON MEMBERS' LUNCHEON CLUB

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

at 12.30 p.m. on Friday, March 18th and April 22nd, 1955.

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

Coventry Group Annual Dinner

AMONG the guests at the Coventry Group Annual Dinner, held at the Barras House Hotel on February 5, 1955, were the Region 3 Representative (Mr. J. Timbrell, G6OI), the D.R. for Birmingham (Mr. G. Swinnerton, G6AS), and the C.R. for Staffordshire (Mr. W. A. Higgins, G8GF). The toast to the Society was proposed by Mr. R. Palmer (G5PP) who asked the R.R. to convey to the General Secretary (Mr. John Clarricoats, G6CL) the Group's congratulations on his recent honour. Mr. Timbrell, responding, spoke of the importance of an increase in the membership of the R.S.G.B.

During the grand draw at Coventry Group's Annual Dinner more than 100 prizes were distributed. In this picture, from left to right, are Messrs. J. R. Tuck, G6TD (T.R. for Coventry), Smith, J. Timbrell, G6OI, W. W. Westacott, B.R.S.15332 and R. Palmer (G5PP). *(Photo by G3ABA)*

TWO METRES AND DOWN

By F. G. LAMBETH (G2AIW)*

IT is neither the desire nor the prerogative of this column to set up as an arbiter of operating procedure, but it is felt that a few words on the subject, specifically as regards phone working, might be helpful to some of those who err, from time to time, probably in all innocence. Within these islands it is becoming a growing illegal practice for many phone stations to sign off without using the national prefix, *e.g.* " 2XXX standing by for 3ZZZ " which is also somewhat irregular for another reason—namely, the call of the station signing should always be given last. The sense of this argument will be readily realised by all who have heard the very tail-end of a QSO and quite misunderstood who was who! It is a truism that there is what seems to be almost a congenital British antipathy to doing as one is expected to do, but there is no shame for the rugged individualist in departing from his principles in order to help his less fortunate and more conforming brethren.

Allied to this is the assistance that all stations can give from time to time in the matter of identification. When distant phone transmissions are audible, but too weak to copy, it would be desirable to sign on c.w. This might be the salvation of many contacts which would otherwise be missed. Such advice has been repeated many times, but it is still not followed very frequently. In fact, a little more c.w. working would help a great deal; after all, one can always change to phone if the signals are good enough !

Equipment For Two

A comparatively easy type of equipment for getting on 2 m has appeared in the T.R.1143 transmitter, currently available from BULLETIN advertisers at a very reasonable price; it does not need very much in the way of modification. G6OX (Hampton Court) has been using one with success and G2BDP (Guildford) will follow suit shortly.

Reports

It has been noticed recently that letters reach us chiefly from the regular faithful few. It is, therefore, time to call for reports, criticisms and observations from other readers of this column. If you want this feature to thrive, it *must* have something to feed on, so please remember that you, too, can help. Such exhortations apply especially to 70 cm. There are many stations on the band, but letters or reports are very scarce—to receive three in any one month is excellent!

Mid-Herts Net

G5UM (Knebworth) reports on the activities of the Mid-Herts net, which meets on Monday evenings on 1850 kc/s. The shortcomings of the Top Band have been emphasized by the high noise level which makes even local operation hazardous after dark. There are now signs that the whole operation may be transferred to 2 m, although this is only an idea at present. Mr. Bartlett's remarks in his Presidential Address (pointing out the desirability and importance of more v.h.f. band occupancy) has helped to crystallize the situation, but the main snag is equipment. About a dozen members of the Welwyn Garden City Group, anxious to get some practical information on 2 m operation, are arranging a special " First Steps on Two " meeting on April 5. (see " Forthcoming Events "). We welcome this innovation. Anyone wishing to operate on v.h.f. will be warmly welcomed at the meeting.

West of Scotland V.H.F. Dinner

The West of Scotland V.H.F. Group and the International V.H.F. Society are holding a Dinner on March 30, 1955, at 6.30 p.m., in the Royal Hotel, Sauchiehall Street, Glasgow. Phil Thorogood (G4KD) and Harry Wilson (EI2W), President and Founder-President respectively of the I.V.H.F.S., have promised to attend and a representative gathering of Scottish enthusiasts is expected. During the evening, the I.V.H.F.S. Irish Perpetual V.H.F. Trophy will be presented to Jock Kyle (GM6WL). Further particulars may be obtained from James Hunter (GM6ZV), Hon. Secretary, West of Scotland V.H.F. Group, 20 Mansefield Crescent, Clarkston, Glasgow.

Station Reports—2 Metres

The period under review started off very well, with plenty of activity and a fairly open band but conditions deteriorated badly later; in fact, for some time no signals were heard at all. There have been good periods but nothing worthy of special record.

G2DHV (Blackheath Common, S.E.13), again active with his 4-over-4 indoor Yagi, has recently been successful in getting over the Chilterns to work G6NB (Brill). The converter in use is of the ON4BZ-type, which has a very low noise factor. **B.R.S.6327** (Earlsfield) who usually listens for about two hours a day, has an impressive list (for a poorish period) in " Calls Worked and Heard." The best day was January 23 when three continental stations were heard; in fact, for a time part of the band was just like 14 Mc/s with QRM on many stations! There was considerable fading on all signals from stations more than 15 to 20 miles distant.

G8VN (Rugby) mentions January 23, 24 and 25 as being the outstanding days during the period under review, conditions otherwise being indifferent.

Change of Date

FIRST INTERNATIONAL V.H.F./U.H.F. CONVENTION

To be held in London on May 14, 1955

Further details will be available later from Phil Thorogood (G4KD), 35 Gibbs Green, Edgware, Middlesex.

*21 Bridge Way, Whitton, Twickenham, Middx.

GW3GWA was worked on the 23rd for a first contact with Denbighshire. This is all the more remarkable because '3GWA is not normally audible at '8VN. On January 24 and 25 continental stations were heard, among them ON4TW and F8GH—both for the first time. Contacts were made under poor conditions with G3HHD and '3JZF, both in Erdington, Birmingham. A QSO on February 7 with G2COP (Lichfield) led to a 20 m/2 m cross-band contact with '2COP's signals S4 on 20 m (150w) and S8 on 2 m at half power! Since G6NB put up his new aerial, signals from his new location are comparable with those from his old one. G8VN states that the most active Midlands stations are now G2ATK, '2HCG, '3GJQ, '3CKQ, '3DKF, '3FUW, '3GHO, '5ML, '6PO, '6YU and "possibly" himself. '8VN thinks that if the period 19.00 to 19.10 G.M.T. were made a CQ calling time by *all* 2 m stations this would increase the activity. We agree and hope as many as possible will follow up the idea.

G2CZS (Chelmsford) worked F8AA on January 24, RST589 both ways, and heard several other continentals at good strength, but owing to pressure of time couldn't go after them. Work is proceeding on a new 3-over-3-over-3 aerial with "T" matched Yagis and a matching unit. An i.f. head amplifier between converter and main receiver is also under construction.

B.R.S.19162 (Dewsbury) has been in the rather unenviable position of hearing somebody else working the DX! On January 24 and 25, he heard G5YV working continentals, none of whom were audible on his receiver. He comments that meteorological conditions were favourable for the openings (see November BULLETIN). Measurements taken by '19162 and confirmed by an official station six miles distant shows that between 08.00 G.M.T. and 20.00 G.M.T. on January 25 there was a fall of 2.2 millibars vapour pressure and 1 millibar barometric pressure. '19162 hopes to have his 6 element stack outside soon.

G5CP (Chesterfield) reports that although his sked with G5MA has been somewhat erratic recently (partly owing to bad conditions) it totalled 86 contacts up to February 15. '5CP is also working regularly with '6XM (York) on Sundays at 08.30 G.M.T. As might be expected this contact is always S9+ both ways! G5AU (Warrington) who recently visited '5CP, is active between 18.30-19.30 on approximately 144.4 Mc/s.

G8IL (near Salisbury) has moved to a new location about 6 miles further out in the country (still in Wilts.) and sends 73 to all old v.h.f. friends. He will be on again soon. **G3CCH** (Scunthorpe) has been ill but is happily better again. Before this break he regularly worked G3IWJ (Liverpool) for long periods at a time on phone, and yet frequently when they called CQ again, there was not a soul to be heard! Lack of activity rather than poor conditions seems to be the answer. '3CCH would like to hear from anyone willing to co-operate in s.s.b. experiments on 2 m. Those who can already operate s.s.b. on the lower frequencies are especially welcome.

G3EMU (Canterbury) who lost his beam in the gales last year has so far been unsuccessful in his efforts to get the new aerial (a pair of slots) up again. '3EMU asks what is the possibility of someone producing an R.S.G.B. 70 cm converter based on the same ideas (simplicity and effectiveness) as those embodied in the excellent 2 m equipment? **G5MR** (Hythe, Kent), commenting on the use of v.f.o.s, says he prefers crystal control and adherence to the Band Plan for 2 m but realises, however, that those round the middle of the band are very fortunately zoned and that he might feel differently if he worked near the h.f. end! Operation recently has been marred by continual cold northerly winds which are always fatal to 2 m conditions in his locality.

G6TA (Streatham) is using 20 watts to an 832 again, having had some local trouble with the higher power, for which he apologizes. This has entailed a sacrifice of half to one S-point in reports at 50-100 miles. '6TA seems to blow skyhigh the plaints of non-activity with a list of nearly 80 stations worked during a period of poorish conditions. Stations to the west and south-west were, however, rarely heard.

G3WW (Wimblington) who worked 43 stations and heard another 17 during the month, asks "What, therefore, is lack of activity?" We wouldn't know, in the face of that, but it is a fact that there have been "dead band" conditions on many occasions. '3WW participated in the happenings of January 23 and 24, when he worked 22 stations including PE1PL, PA0DSW and ON4BZ, the latter reporting '3WW was being heterodyned by GW3GWA (Wrexham)! On January 28, G5KW/P was worked whilst portable in Hunts. and later in Rutland. On February 6 a good duplex cross-band QSO was had with G3FAN (144), '3WW being on 3.7 Mc/s. Richard has fitted G8RY-preferred 0.396H splatter chokes with 5-6 kc/s bandwidth. Improved quality has since been reported by G2DUS compared with the restricted quality with 0.15H chokes and 25 kc/s spread with no chokes or diode filter. Since February 14 '3WW has been using a Labgear crystal controlled converter as shown at the R.S.G.B. Exhibition last November. On it, all the signals previously heard can be excellently received. The performance compares very well with that of converters otherwise used at Wimblington. It comprises two twin triodes, one as combined grounded grid r.f. stage and mixer, the other as crystal oscillator and multiplier. The tunable i.f. is 4-6 Mc/s. **G8PX** (Oxford) has his portable transmitter completed, although he is not yet quite satisfied with it. **G6XX** (Howden, Yorks) operated during the period January 23-25 when he worked DL3VJ and ON4BZ and heard F8GH and F8HL. G5TZ was also worked at S8-9 but conditions and activity were generally poor.

G2ADZ (Woolacombe, Devon) heard no continental stations on January 23 but a good QSO was had with G5TZ (I.o.W.) while G2AIW and '5MA were logged. This was '2ADZ's sole reward for five hours operation! On the 22nd, GI3CWY, G3IWJ, '3EPW, '5YV and G3IUD provided good contacts. Nothing has been heard from the south. **G3GHO** (Roade) has erected a new aerial (4-over-4, gamma matched) 28ft high, but it is not liked. A slot aerial will go up when the weather permits. He then hopes to hear and work something! ON4BZ was heard (579) and called on January 23 but no QSO resulted. On the 24th, ON4BZ and PE1PL were audible and although called, were not raised. The 4-over-4 aerial is suspected for these failures and for the fact that DL3VJ was heard but not worked on January 25. ON4BZ was again S9, but as '3GHO was trying to put '8VN and '2ABD in touch no QSO resulted. '8VN and '2ABD did eventually make contact however. '3GHO thinks this opening possibly more or less missed the Midlands.

G5YV (Leeds) writes that he was very interested in the letter from Dr. R. L. Smith-Rose published in the February BULLETIN. He has been making thrice daily checks over five or six weeks on relative humidity, vapour pressure, air pressure, temperature and the signal strength (db above noise) of PE1PL and other fixed stations with regular service. All the results are shown

in graphs on a single sheet of paper and it can be seen, more or less at a glance, how these variables appear in relation to each other. This most interesting and absorbing occupation would give a great impetus to activity on the bands if more v.h.f. operators co-operated. It would be useful both on 144 and 420 Mc/s. If any reader joins in, we shall be glad to have reports.

G5YV also says that conditions were very good in Leeds on January 23 and the early part of the 24th (the band was flat in the evening) and for most of the 25th. During that period many DL, F, ON and PA stations were worked or heard as well as some G-DX. The level of activity both on the continent and in the United Kingdom is apparently very low according to DL3VJ and PA0FB. There is reported to be at least one German TV station (Dresden) in the band, operating on 145.25 Mc/s! **G3BJQ** (Rugby) also had a good time on January 23-25. Since then, however, the band has been "pretty dead" and seems to have reached an all-time low. There are a few new stations from time to time but many of the regulars seem to be hibernating again! G8VN, '3CKQ and '3BJQ form a very active group in Rugby; when they cannot get QSOs they compare notes, but usually there is little to report especially after 19.25 G.M.T., when TV has started. '3BJQ wonders whether there are any similar groups working together in this way?

G6XM (Yorks.) found only one good day (January 23) and although he has been on the band most evenings since, activity and conditions have been very poor. All the same he submits a respectable little list of "Calls Worked and Heard." '6XM hopes to be mobile on 144 Mc/s shortly.

G3FIH (Bath) notes as outstanding the opening of January 24. It is surprising that although a QSO with ON4BZ was S9 both ways, '3FIH could not hear any other continental stations. Other first contacts on that evening were with G6OX (Hampton Court) and G2AIW. For the remainder of the period only local QSOs have resulted.

G2AHP (Perivale), missing from the band through indisposition, has appeared again and we hope he is quite recovered. Stations worked recently include G6OU (Basingstoke), happily active again after a spell in hospital and G2GG (Newbury) who puts in quite a good signal although he has no mains available. Both G2GG and G8WI (Henley-on-Thames) were first contacts. Twenty-one stations were heard on February 20, mainly local, which is an improvement on some days lately! The main topic of conversation appears to be mobile and portable equipment. It looks as if the coming season will be a very lively one!

Two Metre News from Scotland

Nothing outstanding has occurred recently but much new gear is being constructed; activity has been reasonable. All the following are frequently heard: GM5VG, '6KH, '6ZV, '6WL, '4HX, '3NG, '3DYC, '3INK, '3FOW, '3CHN, '2CQI and also a newcomer, GM3JFJ, who has contacted most of the others. He uses a 522 transmitter and a home made receiver which will be scrapped shortly in favour of a more efficient set. We are indebted to **GM6WL** for this report.

Seventy Centimetre News

The monthly London Area activity list from **G2RD** (Wallington) is as follows (17/1/55 to 16/2/55): G2AIH (434.25), '2DD (434.79), '2DDD (435.66), '2DSP (434.97), '2FKZ (435.95), '2HDJ (434.5), '2HDY (435.5), '2MV (435.18), '2RD (435.53), '2WJ (436), '2WS (434.37), '3ECA (434.85), '3EOH (436.03), '3FP (434.98), '3GDR (435.39), '3HBW (434.61), '3IRW (434.4), '3JQN (435.05), '5CD (435.66), '5DT (434.9), '5KH (435.2), '5RD (435.25), '5UM (434.37), '6JI (435.9), '6LL (433.44), '6NF (435.6), '6YP (435?) '8SK (435.1).

G3JQN (Croydon) has been on 70 cm since March, 1954, and up to now has worked 19 different stations in six counties, his total contacts during the period being 174. Very little has been achieved recently, although G2XV (Cambridge) was heard at RST549 down to RST219 on December 29 last; he was called several times without success. '3JQN thinks that 70 cm is deserted in favour of 2 m when conditions are good. G5DT (Wallington) informed '3JQN recently that he had worked 63 stations in 15 counties and has had 835 contacts since 1954. The band cannot be so dead!

G2DDD (Littlehampton) reports that skeds with G3HBW have been maintained and in most cases contacts have been made. As a result of a letter from F8OL (435 Mc/s) to G2DSP asking for 70 cm skeds, G2DDD, '2DSP and '3JHM will call from 19.30-35 G.M.T. and listen from 19.35-40 G.M.T. daily, commencing March 15. F8OL says that there should be more activity on the band in France during the coming season.

G3WW (Wimblington, 435.6) reports being heard on February 1 by G2XV (Cambridge) at 599, this success being the result of practical and constructional help given by G3BKQ, '2DD, '3HAZ and '2BVW. Since then only G2XV has been heard in spite of transmitter and receiver tests with G3FUL and many c.w. CQ calls. '3WW is active on 70 cm at 19.00 G.M.T. and at 11.00 on Sundays.

News from Scotland

GM6WL reports that '3FOW, '6KH, '3NG, '3INK and '6WL are all still active, and that they have been joined by GM3DYC. The latter has surprised them all, as he is located in the heart of Glasgow's built-up area; after somewhat poor results he changed over to two stacked slots outside the window of his fourth floor room and a good 'phone signal to '6KH (Hamilton, 12 miles) resulted. Strangely enough, this direction (east) is the one which brings best results to '3INK and '6WL who are both south-west of '3DYC. Obviously reflection plays some part in this. The weather has been very bad lately but the path from GM3NG to GM6WL (20 miles) is always open in any weather. At the Glasgow end, the aerial is indoors (behind a large old-fashioned un-metalled window) whilst at Carluke it is outdoors with open wire feeder polythene spaced every 13in.

London International V.H.F. Convention

The original date of the Convention organised by the London U.H.F. Group and the International V.H.F. Society has been found to clash with the F.A. Cup Final and accordingly has been altered to May 14. This date is not yet quite definite, but will be so unless any unforeseen snags appear. It is hoped to have two organised visits of electronic interest in the morning followed by lunch at the Bedford Corner Hotel. The afternoon will be devoted to a v.h.f. exhibition and lecture meeting. The proceedings will culminate in a dinner which will also be held at the Bedford Corner Hotel.

1250 Mc/s

We understand that several stations expect to be active on 1250 Mc/s within the next few months, among them

G2DD, G3HBW and G5DT. Reports are awaited with interest. G5DT has a transmitter working but has had no contacts so far.

Tropospheric Propagation Research

A circular entitled *Cheyenne Mountain Tropospheric Experiments*, which describes the Central Radio Propagation Laboratories' facilities at Cheyenne Mountain, Colorado, U.S.A., and gives some sample results of the research carried out there, has been issued by the U.S. National Bureau of Standards. The Circular (No. 554) costs 40 cents, including postage, and may be obtained from the Government Printing Office, Connecticut Avenue at Van Ness Street North West, Washington, D.C.

The site at Cheyenne Mountain was established for use in studies of tropospheric radio propagation in the v.h.f. and u.h.f. regions. The facilities include high power transmitters on five frequencies from 92 to 1046 Mc/s. Continuously recording field strength receivers are located at four receiving stations at up to 226 miles from the mountain, with provisions for semi-fixed recordings at Anthony, Kansas, and Fayetteville, Arkansas, 393 and 617 miles respectively from the transmitter site.

An extensive radio meteorological unit is installed at Haswell, Colorado, where accurate measurements of temperature, pressure and humidity are made with electronic measuring devices. Refractive-index turbulence is measured with a microwave refractometer developed by the National Bureau of Standards.

In the Circular the new theory of tropospheric propagation embodying the Booker-Gordon scattering principles as extended by Staras is related to the measurements.

Two Metre Openings

During the evening of March 1, signals from GC2FZC and GC3EBK (both in Guernsey) were heard at excellent strength in the south of England. Among those known to have made contact with them are G2HDZ, G5KW/P (Hampstead Heath), G5MA and G6NB.

Conditions were again good on March 2 when many continental stations were heard. **G6NB** (Brill, Bucks) worked DL3VJ, F9JY, F9LD, GD3UB, ON4BZ, PA0FB, PA0HAK, PA0HAR and PA0RK; he heard an unidentified GI signal and a station believed to be DL9ARA. **G5YV** (Leeds) worked DL3VJ while G6XM (York) exchanged signals with PA0HAK and ON4BZ. **G5KW/P** (Hampstead Heath) had many European contacts. The opening is believed to have been due to ducting.

On March 3, conditions were above average, with continental stations reported worked as early as midday.

Members will recall that both 2 m and 70 cm were wide open to all parts of Europe in March, 1953.

* * *

Reports and letters for the April issue by March 21 please.

Worked and Heard on Two

G2ADZ (Woolacombe) January 22-February 23.
Worked: G3EPW, '3IUD, '3IWJ, '5YV, GI3CWY. *Heard:* G2AIW, '2HGR, '5BD, '5ML, '5MA.

G2CZS (Chelmsford) January 17-February 17.
Worked: F8AA, G2YB, '3ANB, '3CVO, '3HWJ, '3IIT, '3JXN, '3KEQ, '3WW, '5JO, '6LL, '6TA, '8KW, '8LN. *Heard:* G2DJM, '2HCG, '2PU, '2WJ, '3DJX, '3FAN, '3FYY, '3KBB, '3VI, '4AC, '4AJ, '4OT, '5KW/M, '5UM, '5TZ, '5YV, '6JJ, '6NB, '6OX, '6RH, '6XH, '6XM, ON4BZ, ON4HN, PA0FB, PE1PL.

G3BJQ (Rugby) January 23-February 20.
Worked: G2WS, '2COP, '2FNW, '3CKQ, '3CRH, '3DJX, '3DFK, '3EPW, '3FUL, '3FUW, '3HAN, '3HHD, '3IVF, '5BD, '5MR, '5SK, '5YV, '6NB, '6PO, '6TA, '6XM, '6XX. *Heard:* G2AOK, '2ATK, '2BVW, '2CZS, '2HCG, '3BA, '3WW, '3ABA, '3APY, '3ASC, '3ENS, '3FAN, '3GHO, '3GKZ, '3HAZ, '3IAI, '3JZF, '4SA, '5CP, '5JU, '5MA, '5ML, '6CW, '6FK, '6SN, '6YU.

G3FIH (Bath) January 22-February 20.
Worked: G2AIW, '2YB, '3FAN, '3FKO, '3GMN, '3IER, '3IRA, '3JZF, '3YH, '6TA, '6OX, GW8UH, ON4BZ. *Heard:* G2ADZ, '2FTS, '2HCG, '3FMO, '3GVF, 4SA, '5MA, '5YV, '6NB, '6OZ, '6XM, '8KW, GW2ACW, GW5BI.

G3WW (Wimblington) January 20-February 21.
Worked: G2ABD, '2AIW, '2BVW, '2CIW, '2COP, '2CZS, '2DUS, '2FJR, '2FQP, '2HCG, '2HQP, '2PU, '2XV, '3APY, '3BII, '3BSU, '3DOV, '3FAN, '3FUL, '3FW, '3GDR, '3GGJ, '3GNJ, '3HZF, '3IAI, '3IEX, '3IIT, '3IUK, '3JZF, '3KEQ, '5JU, '5KW/P (Hunts & Rutland), '5MR, '5YV, '6AG, '6LL, '6RH, '6TA, '6XH, '6XM, '6XX, '8BP, '8KW, ON4BZ, PA0DSW, PE1PL. *Heard:* G2MV, '3CHR, '3CVO, '3EPW, '3FIH, '3GSE, '3HWJ, '3HXS, '3IOO, '3IWJ, '4AJ, '4OT, '4SA, '5JO, '5ML, '5TZ, '6LL.

G5YV (Leeds) Mainly January 23-January 25.
Worked: DL3VJ, F3LF, '8GH, G2ADZ, '2BMZ, '3AUS, '3CQC, ON4BZ, '4TW, PA0DSW, '0FB, PE1PL. *Heard:* DL1FF, F3JN, '8NW, '8QR, '9EA.

G6TA (Streatham) January 19-February 19.
Worked: F3JN, G2ABD, '2AHP, '2AHL, '2AHY, '2AIH, '2AOK, '2BMS, '2COP, '2CVD, '2CZS, '2DTO, '2DUV, '2HCG, '2UN, '2YB, '3AGR, '3ANB, '3ARL, '3BII, '3BJQ, '3BTC, '3BYY, '3CKQ, '3CRH, '3DJX, '3DKF, '3EGG, '3EGV, '3ENY, '3EPW, '3FAN, '3FGT, 3FIH, '3FUH, '3FUL, '3FYY, '3GHO, '3GSM, '3HHD, '3HWJ, '3HXS, '3HZJ, '3IAM, '3IES, '3IJW, '3IOO, '3ISA, '3JEP, '3JFR, '3JJH, '3WW, '3XC, '4GT, '4SA, '5CP, '5DF, '5KW, '5KW/M, '5LK, '5LO, '5ML, '5MR, '5TZ, '5UM, '5YH, '5YV, '6FG, '6JP, '6OX, '6PO, '6XA, '6XM, '6YU, '8KW, '8KZ, '8VN.

G6XM (York) January 18-February 20.
Worked: G2DCI, '2FCL, '2FJR, '2KO, '2YB, '3BA, '3CRH, '3DKF, '3FCB, '3GCX, '3GFW, '3GNJ, '3HAW, '3HZF, '3IOE, '3IPH, '3IWJ, '3WW, '4SA, '5AU, '5CP, '5GX, '5KW/P, '5ML, '5TZ, '6CW, '6FK, '6NB, '6TA, '6UJ, '6XA, '6XX, '8BP, '8VN, GW3GWA. *Heard:* G2HCG, G3BJQ, '3FAN, PE1PL.

G8VN (Rugby) January 14-February 15.
Heard: G2ABD, '2ATK, '2COP, '2CZS, '2DCI, '2FTS, '2HCG, '2PU, '3BA, '3BJQ, '3CKQ, '3DKF, '3ENS, '3FUW, '3GBJ, '3GHO, '3GNJ, '3HZF, '3HHD, '3ISA, '3IUD, '3IVF, '3JZF, '5AU, '5BM, '5CP, '5JU, '5MA, '5MR, '5TZ, '5YV, '6AG, '6CW, '6NB, '6PO, '6SN, '6TA, '6XA, '6XX, '6XM, '6YU, GW3GWA, F8GH, ON4TW, 24 of the above also worked.

B.R.S.6327 (Earlsfield) January 11-February 12.
Heard: G2ABD, '2AIH, '2AIW, '2BZ, '2DTO, '2FTS, '2HCG, '2PU, '2WS, '2YB, '2YU, '3BIQ, '3BII, '3DF, '3EPW, '3FAN, '3FIH, '3FPV, '3FQS, '3FSG, '3FUH, '3FVV, '3FYY, '3GG, '3GHI, '3GSE, '3GSM, '3HBW, '3HDD, '3HWJ, '3ISA, '3IUL, '3JDP, '3JFR, '3JJH, '3JQN, '3JXN, '3KEQ, '3XC/M (nr. Woking), '3WN, '3ZI, '4AJ, '4GR, '4KD, '5CP, '5JO, '5KW, '5LK, '5MA, '5NL, '5TZ, '5UM, '5YH, '6AG, '6FK, '6JP, '6KD, '6LL, '6MB, '6NB, '6OX, '6PO, '6TA, '6XH, '6YM, '6YU, '8GD, '8KW, '8KZ, F3JN, ON4BZ, ON4HN, PE1PL.

B.R.S.19162 (Dewsbury) To February 13.
Heard: G2FJR, '3ENS, '3IWJ, '3WW, '5AU, '5CP, '5ML, '6NB.

British Institution of Radio Engineers

DR. K. R. STURLEY, representing the B.B.C., and Mr. F. T. Lett, representing the radio industry, will open a discussion on "The B.B.C. V.H.F. F.M. Sound Broadcasting Service" at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, London, W.C.1, at 6.30 p.m. on April 13.

Diabetics

HANDICAPPED for the past three years by diabetes, Mr. E. C. Clayson (G3IIY), The Mansion, Harrold, Bedford, would like to hear from fellow sufferers. He is active on 3.5 Mc/s on Sundays.

LONDON U.H.F. GROUP

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

at 7.30 p.m., April 7, 1955.

All u.h.f. enthusiasts welcome.

THE MONTH ON THE AIR

By S. A. HERBERT (G3ATU)*

HAPPILY, the end of January saw an improvement in conditions generally, with DX workable on all bands—there is even a report on ten metres! The B.E.R.U. Contest, as usual, stirred things up in no uncertain manner and the appearance of some rare ones helped to bring life—and the wolf-packs—back to the bands. While in this mood of optimism, here is a little sunspot information.

Spot On

The Astronomer Royal reports the appearance of two sunspots that are the first sizeable ones of the new eleven-year cycle. Solar latitudes were 20°N and 36°N and dates on the sun's disc were January 2-14 and January 7-19 respectively. The sunspot cycle, which reached its great peak in 1947, presumably ended just before the middle of 1954. There has been the characteristic overlap in latitude of the old-cycle spots petering out in equatorial regions and the increasing incidence of the small new-cycle spots in latitude 20°N-40°N. Any remaining doubt concerning the epoch of minimum significant to 1954 is now removed by the appearance of these definite spot groups, indicating that the new eleven-year cycle has begun.

The above information, condensed from an article appearing in *Nature* for January 1955, was passed on to us by **G2DH,** who remarks that this official statement justifies the optimism we have all had to buoy us up during the past few years. As the last cycle passed from minimum in 1944 to maximum in 1947, the next two years should be interesting.

Top Band News

Conditions on Top Band have improved again and early morning activity has been high, despite the recent spell of wintry weather. However, before dealing with the DX there is news of forthcoming activity from some of the rarer reaches of the British Isles. G3JML, G3IGW and B.R.S.19804 are off to Scotland during Easter and will operate **GM3IGW/A** from Selkirk (April 9), East Lothian (April 10), and Kinross (April 11), returning home on April 12. 3.5 Mc/s gear is being taken, but all night-time operation will be on 1.8 Mc/s. **G3GZA** should be active from the Outer Hebrides until May 28. Stations wishing to make a "sked" should write to D. J. West, R/T, c/o S.T.O., Ministry of Civil Aviation, Stornoway Airport, Isle of Harris. Aerial difficulties may arise, owing to the fact that there are no trees on the island, but **GM3GZA** will be active each evening and will stay up all night at week-ends as long as he is making QSOs!

G3ABG, who is Contests Manager for the Tops C.W. Club, sends details of the Club's annual "Hester Trophy" contest which will be held on April 23 from 2100 to 2400 B.S.T. Competitors will receive points for contacts with non-member stations and several "Tops" members will be active from the "rarer" U.K. counties. It is hoped that special permission will be granted to member-stations in EI, OZ and PA for Top Band operation during the contest period, while other overseas stations will operate in the range 3500-3550 kc/s and listen on 160 for replies.

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

Contests Diary

1955

March 25–27	-	A.R.R.L. DX Contest (c.w.)
May 1	-	Two Metre Field Day (No. 1)
May 21–22	-	420 Mc/s Contest (No. 1)
June 4–5	-	N.F.D.*
July 2–3	-	Two Metre Open
August 7	-	Two Metre Field Day (No. 2)
September 4	-	Low Power Field Day
September 10–11		420 Mc/s Contest (No. 2)
September 24–25		420 Mc/s Contest (No. 2)
October 1–2	-	Low Power
November 12–13		Top Band (No. 2)

*For rules, see page 138, R.S.G.B. BULLETIN, *September*, 1954.

G3JOJ (Camelford), with G3GQS, plans a trip to the Scilly Is. The date is not definite, but will probably be Easter week-end. Meanwhile, '3JOJ has done well with a lengthened but bent 200ft wire with which he has raised ZC4GF, YU1GM and an EA2. He has also made 40 odd contacts with the U.S.A., but he's spent many a humiliating hour calling VP7, KV4, etc., to no avail. OD5LX and an F7 were also heard. **G2HKU** (Sheerness) is at last on a.c. mains after spending years on batteries and d.c. power, during which time he made the very respectable score of 16 countries in 4 continents. He has worked HB, OK, PA0PN, DL2VO (Herford) and GM3EHI (Lanark), GM3GZC (Argyll), GM3JDR (Caithness) and GM3HRZ (Moray), and heard W1BB, W8ANO and W9PNE. PA0PN told him Dutch stations may work Gs only in an emergency and are in any case under the control of the Netherlands Post Office when on the band. **G3ERN** (Harlow) worked just about everything between January 30-February 20, making contact with VP7NG, YU1GM, W1,2,3,9, VE2WK, ZB1BF, OD5LX, KP4KD and PA0RC. Later he heard ZB1BF working a 9S4, while strings of Ws were keeping TI9MHB occupied. The TI9, unfortunately, could not be heard. **G3JVK** (Worthing) is now 16 years young (he was licensed when 15) and so should reap the benefit of many a future sunspot maximum. He is up to 41 counties worked, with GM3HHB (Stirling), GM3DOD (Renfrew), G2FQP (Hunts.), as recent additions. HB and OK have also been worked and OD5LX, W, VE and VP4IZ heard. **G2DHV** reports that club station G3HEV (Downham) is active on Top Band, 7 Mc/s (A3) and 14 Mc/s (A1). **G6LB** (Chelmsford) finds the going very hard. So far, he has had a poor season, but is still experimenting with aerials, hoping to find one capable of giving consistent results to North America from the bottom of a deep hollow.

W1WY (Stamford, Conn) who details his results to the end of January runs only 25 watts—very QRP by American standards—to a 400ft loaded end-fed wire. On this he has raised YV5DE, KP4CC, VP7NM and heard G5JU, EI9J, G6GM and OK1HI under poor conditions. When the long wire came down a temporary 125ft aerial (with one end only 15ft high) was used to work G5RI, G5JU and EI9J, while the same night G6GM, G6LB, G3HRW, HB9CM and KV4AA were heard. Although conditions were good at the time it shows what can be done. W1WY will be on the band for the rest of the DX season.

B.R.S.20106 (Petts Wood) has heard Ws calling TI9MHB around 1884 kc/s. He thinks that only twice so far has U.S. phone been heard—W8GDQ on both occasions, but of late the signal level has been up slightly. He has logged c.w. from YU1GM (1872 kc/s), OD5LX, KV4AA, KP4KD, '4DV, VP7NG, VE2WK and W1,2,3,4, 8 and 9. **B.R.S.20410** (Wigan), using an 0-V-2 receiver, has heard OK, DL, EI and HB9, etc. He was interested to read that G3JOJ had worked a W with a 50ft wire, especially as his own Top Band reception of ZL1AH was made with a 40ft aerial only 25ft high. Bill grumbles about British phone stations who engage in lengthy rag-chews on different frequencies, so causing unnecessary interference to weak c.w.!

Ten Metres

B.R.S.18791 (Chichester) reports that on January 17, at around 1730 G.M.T., he heard W4EKZ (Fla.) on phone (RS44-6), working an inaudible W1 on 28 Mc/s. Ah, well, it could be different next year.

Fifteen Metres

Fifteen still suffers from lack of activity, except at week-ends. **B.R.S.20133** used the phone section to catch CR6AG, '6BX, CX5AF, FF8AP, HC, KZ5, ZE, ZS and W. **B.R.S.20487** logged VP5SC and HP3FL the same way, as did **B.R.S.20106** with ZL4HE, ZL4GC, EL1OA and EL12A. C.W. produced VU2JP, OA4C, OA4ED, VO6U, ZD6BX, ZE4JE and a UA6.

Twenty Metres

At least this band keeps the DX chaser going; VRs and ZM7s may still be scarce, but there *are* rare ones around from time to time. **TI9MHB,** who started operating on February 11, worked all and sundry with very considerable skill, using 1.8 to 21 Mc/s c.w. and phone, for some two weeks. Although he was heard to say that 3.5 Mc/s between 0300-0600 was the best bet for working into Europe, he must have contacted numerous Europeans on 14 Mc/s. It was also pleasant at last to hear **G2RO,** who, his monumental tour almost over, has been putting in consistent signals from **VQ8AY** (Mauritius). As far as we know, this is the first time on his present trip that he has been audible in Europe.

As to individual reports **B.R.S.20487** (N. Finchley) heard phone from HC1FG, KL7ZG, VK5MS, VP5AR and ZS. Using the same medium, **B.R.S.20133** (Melton Mowbray) heard FM7WN, CO2BL, HK3PC, KA, KG6ABN, KR6AZ, M1B, ZS3AB, 4S7BE, 3A2AM and the highly interesting VR2AB, while **B.R.S.20249** (Sutton) logged MP4BBS (G8RP), MP4BBT (presumably the W5 who is with '8RP and was expecting a licence), and VQ4FK. DL4OR/AM was a strong signal while 9000ft over London. **B.R.S.20106** picked up VQ8AY, KH6ES (1820), FY7YC, CR7AG, VE5AT, PZ1QM, EL2L, FB8BL, FG7XB, ET3GB, ET3S, ZD6EF, FP8AP, VK1EG, VP5HK, FM7WP and ZS7D on c.w. and logged TI9MHB on phone, plus VP2DA, '2KM, ST2DB, FY7YE, HH2LG, '2LR, ZP5CF, ZS3P and the rare HK0AI. **G2DHV,** still using a B2 with 25 watts input, was glad to raise ZL1AH during the B.E.R.U. Contest. With this rig and a 66ft VS1AA aerial, he has worked over 100 countries. **G3JVK** worked 15 in five hours, but considers W2JDR his best so far. **G3ABG** (Cannock) moved recently, evidently to a good QTH. Using a temporary aerial, the first two CQ calls on c.w. brought back two new ones — VP8BD (Graham Land) and ZD6BX!

Forty Metres

Regular users of 7 Mc/s have become used to the dreadful distractions thereon, but what are the feelings of those who have not used it for years? G3HK (Maryport), whose favourite DX frequency was around 7280 kc/s, recently returned to the air after five years' absence. His immediate reaction was that he should apply for a special 200kW jammer ticket and join in the free-for-all! Nevertheless, '3KH has heard VP8BH (Deception Is.) at good strength, but South Americans persisted in butting in. The QSO scratchers are still there. **B.R.S.20106** dug out TI2PZ, KZ5BE, EL2X, VK2AMB, ZL and W6ANN (0815) on c.w., while **B.R.S.20249** was pleased to hear 9S4CH. VP5SG was an S8 signal at **G6CL** at 2300 G.M.T. on March 2.

Eighty Metres

The 3.5 Mc/s band seemed good during B.E.R.U. and less noisy than of late—at least during the small hours. **John Hall** (Beckenham) heard PJ2AO and EL2X on phone. (John, incidentally, has a QSL from HK0AI for 7 Mc/s reception). 3.7 Mc/s c.w. provided **B.R.S.20106** with a plum in the shape of TI9MHB. He also pulled in YV5BJ, VP7NX, HB9MX/HE1, ZL3GQ, ZL4MW, ZL1HY, '1BY, KP4KD while on phone, good ones were CO2BL, '2XZ, VP4BN and ZS6SG. **G3ATU** was delighted to work ZS5U for his first ZS on the band.

News from Overseas

W2GT (Rochelle Park, N.J.), at the request of FG7XB, passes on the information that the latter operates on 7 and 14 Mc/s only, although he has received cards from W, VE, PA0 and G for 3.5 Mc/s contacts. The pirate FG7XB gives a Box 11 QTH. The address of the genuine '7XB appeared in the February *M.O.T.A.* column. **MD5SX,** now back home, is licensed as **G3KAP** (45 Albert Road, Deal, Kent). A founder member of R.A.F.A.R.C., Bletchley (G3HSX) he would be pleased to hear from ex-members of that club and from any ex-MD5/SUs.

ST2GB is active daily on 14 Mc/s. Those wishing to QSL direct should send their cards to 1920216 Sgt. Elliott, J., Sgts' Mess, R.A.F., Khartoum, Sudan.

G3JTG, now in Colombo and licensed as **4S7GE,** is mostly on 14 Mc/s c.w., with 35-40 watts. He will QSL all contacts. 7 Mc/s is quite good out there, but 3.5 is noisy: to date, a few DLs have been heard. '7GE and '7KH (ex-G3IXI) are both looking for G contacts. **G2MI** hears from G8IG and ZD3BFC that ZD3ES will shortly be active on c.w. only. '2MI also gives the welcome news that cards are in from VR3A, VR3D and VS5KU. Will Geoff Stevenson (ex-JY1OG) or anyone who knows his present address, please get in touch with G2MI?

MP4BBS has been active between 14150-14220 kc/s from his floating QTH on board the *M/V Sonic,* operating some 200 miles east of Bahrain, with occasional trips to port for short stays. He cannot operate until 1700. So far, openings have been north and south, with ZD9, OQ5, ZS, etc., worked. QSLs may be sent *via* the R.S.G.B. QSL Bureau. **G3JFF,** basking in Caribbean sunshine, has been too occupied to do any listening. However, as he is due to visit Antigua and Bermuda he may be able to check the bands while there. Before

sailing, he added CR6AI and ZD4BM to the list, to make his total 94-76.

New D.U.F. Claims Address

G2YS passes on information for those wishing to claim French certificates. The new R.E.F. Awards Manager is Edmond Dubois (F9IL), Aubencheul-au-Bac, par Aubigny-au-Bac (Nord), France. G2YS had the bad luck to have a batch of cards—sent by registered post to a previous address—mislaid. FY7YC, hearing of the loss, handsomely sent '2YS two duplicates.

National Convention Bristol Station

Don Davies, **G3RQ,** says that everyone who worked the Bristol Convention station GB3NCB should by now have received a QSL card; listener reports have also been acknowledged, but anyone still in need of a card may obtain one by sending particulars to Don at 51 Theresa Avenue, Bishopston, Bristol, 7.

Late DX News

Ws and PYs have been heard calling **ZD8AA** recently around 14050 kc/s during the early evenings. **LB3OD** is active on board ship. **LB1LF** is on Jan Mayen Is. **AP2U,** active on 14 Mc/s c.w., will soon be on phone. He QSLs by air-mail. XE2KW has been working Europe on 14 Mc/s phone around 1800. **MP4QAL** (Halul Is.) is on 14070 kc/s daily. QSL *via* I.R.T.S.

DX Addresses

AP2U: c/o 6 Roberts Market, Quetta, Pakistan.
EL2L: Sam Butler, Monrovia, Liberia.
KA2CG: U.S.C.G., Lorsta, A.P.O. 68, c/o San Francisco, California, U.S.A.
TI9MHB: P.O. Box 75, Oakland, Calif., U.S.A.
VP2KM: Box 152, St. Kitts, B.W.I.

" Our " Station

The following " verb. sap " is gleefully reprinted from the **Northern California DX Club's** *The DX'ER*. " Why is it that there appear to be so many twins operating amateur stations these days? My XYL says they must be twins, because they say on the air—' We are using this —We will QSL '—in fact it is We, We, We, all the time, yet only one name appears on the QSL card. She always feels sad for the other half of the twin, who never gets a chance to sign his name. Of course, my XYL is ignorant of the finer points of Amateur Radio and can be forgiven, if not silenced! "

* * *

And that rounds off the proceedings for this month. Please send your comments and reports to arrive by March 20. Good hunting and get those ten metre rotaries out of storage!

Empire DX Tour—1

READERS of the February issue of the BULLETIN will have seen on page 398 that something rather unusual in Amateur Radio circles is taking place. Sgt. Frank Johnstone (G3IDC) of the R.A.F. Amateur Radio Society is travelling from the U.K. to Australia and back, *via* many DX locations, from whence he will be operating a small portable transmitter in an effort to make as many contacts as possible with other amateurs.

During a brief stay in Cyprus, February 14-15, G3IDC/ZC4 completed pre-arranged schedules with G8FC, R.A.F.-A.R.S. Headquarters station at Locking, Somerset, and had QSOs with many other stations. The bands used were 3.5, 7 and 14 Mc/s, but because of heavy commercial QRM—which is continuous—3.5 Mc/s was unusable after 1600 G.M.T. Whilst on Cyprus, Frank Johnstone took the opportunity of meeting local amateurs and of explaining to them how their signals sound in the U.K.

On February 16 the " Iris " arrived at Aden in brilliant sunshine. A temporary aerial was once more erected and schedules with G8FC were maintained and several European and African stations worked.

During the period from February 19 to 21 the " Iris " made brief visits to various small islands in the vicinity, thus amateur activity was limited although some lucky people may have made contact with Sgt. Johnstone whilst at these rare DX locations. If such was the case, Headquarters would appreciate further details.

The transmitter used by Sgt. Johnstone is a mains operated all-band job with a maximum input of 40 watts to the final. The receiver is a 740 with, normally, a 100 feet long pi-fed (and end-fed) aerial. No masts have been taken.

Amateurs who wish to look for Sgt. Johnstone at his various locations should concentrate on 14 and 21 Mc/s, although an occasional excursion to 28 Mc/s might pay dividends, but *please* avoid calling on the frequency he is using. Sgt. Johnstone gave an assurance before leaving England that he would not reply to such calls. Incidentally, this is an ideal opportunity to compare signal strengths from many locations emanating from the same transmitter, with a minimum of time lost between transmissions.

Sgt. Johnstone will QSL all contacts and reports, either with overprinted " G " cards or specially printed versions. No cards will, however, be sent out until June, 1955, when his overseas tour is completed.

Start of B.B.C. V.H.F. Service

THE B.B.C. has announced that the first of its new v.h.f. transmitting stations, using frequency modulation, will be brought into service at Wrotham, Kent, twenty-three miles south-east of London, on May 2, 1955. The purpose of this and the other v.h.f. transmitting stations now being built by the B.B.C. is to reinforce the coverage of the existing medium-wave and long-wave services, reception of which is becoming difficult for many listeners because of the increasing interference from foreign stations and from electrical appliances of various kinds.

The new station will transmit the three B.B.C. programmes; the Light Programme on a frequency of 89.1 Mc/s, the Third Programme on 91.3 Mc/s, and the Home Service on 93.5 Mc/s. The effective radiated power will be 120 kW in each case, and the transmissions will be horizontally polarized. The station will serve the London area and South-east England within a range of about fifty miles.

The B.B.C. built Wrotham in 1950 as an experimental station with two transmitters to enable the problems of high power v.h.f. transmissions and their reception to be studied. A third transmitter is now to be added in readiness for the start of the regular programme service, and the present experimental transmissions from Wrotham will cease until April 7 while installation work connected with the additional transmitter is in progress. To assist the radio industry and trade in the London area during this period, there will be low-power test transmissions on 93.8 Mc/s from an experimental v.h.f. f.m. transmitter at Alexandra Palace, which will radiate the Home Service from 9 a.m. until 11 p.m. approximately, each day.

The third transmitter at Wrotham, which will carry the Home Service, differs from the two already installed in that it is built as two separate units for operation in parallel, with each unit capable of maintaining the service at reduced power in the event of a fault on the other.

Frequency Predictions and the DX Bands

By J. DOUGLAS KAY (G3AAE)*

NOW that the sunspot minimum is thought to have passed, propagation conditions can be expected to improve, and this will doubtless result in a renewal of interest in the DX bands. The higher frequency bands in particular will, it is hoped, again yield a rich harvest.

The curve of the approximate eleven year cycle of sunspot activity is not uniformly steep on both sides, but decreases from maximum to minimum about twice as slowly as the slope of the increase from minimum to maximum. Thus, if the sunspot minimum occurred about the middle of 1954, the winter of 1955 should show a great increase in the use of 21 Mc/s, while the winters of 1956-57 should see 28 Mc/s open to world wide communication again, with 21 Mc/s outshining 14 Mc/s as the mainstay for round the year daylight DX working.

Of course, 7 and 3.5 Mc/s will continue to produce their plums for those willing to burn midnight oil, and unearth generally S3 signals from under S9 commercial and mid-European amateur interference.

With these cheering prospects in view we are now commencing a monthly table of predicted optimum frequencies. Anything in the nature of a forecast is something of a gamble, and the figures quoted are given as a guide and are not guaranteed to be absolutely accurate. This is clearly impossible as not only is the ionosphere involved, but the amount of energy radiated, the efficiency and directivity of the radiator, and the efficiency of the receiving installation all have their effect. Additionally, lack of activity at the other end may lead you to believe that a certain band is dead, whereas in reality nobody is listening to your CQ. However, it is hoped that these tables will indicate the times when there is the best chance of establishing contact with the maior DX areas of the world.

The figures given are based on data kindly provided by the Engineer-in-Chief of the Post Office. This data has been amended as a result of a concentrated study of the behaviour of various amateur bands over a long period. We amateurs do try—and succeed—in getting through on much higher frequencies than would be considered for commercial circuits where continuity of service is the foremost consideration. Thus the figures quoted here are generally higher, and therefore more likely to be unreliable. We must remember, however, that our maximum power output is low and that the best results can only be obtained by using the highest possible frequency that will support communication.

At certain times of the day some circuits may be open on more than one band simultaneously, and where this is the case the periods overlap. Conversely there will be times when certain bands cannot be expected to be open to various areas. Where this occurs a single time is shown, and this represents the time when the MUF on that circuit is a maximum, and therefore the time at which freak propagation conditions are most likely to result in an unexpected opening.

With regard to 7 and 3.5 Mc/s, the absorption and noise level at these frequencies is much greater than on the higher frequencies, and it will be found that power plays a more important part than it does on the higher frequencies—10 watts and a good aerial can work the world on 21 or 28 Mc/s when the band is really open. Thus, although a kilowatt transmission from Capetown might put through a very readable signal on 3.5 Mc/s at 0300 G.M.T., one of 50 watts and a dipole aerial would probably be inaudible. These factors have made the predictions for 3.5 and to a lesser extent 7 Mc/s more of a gamble than those for the higher frequency bands. However, all real DX men relish a fight against great odds, and the greater the odds the more satisfaction obtained when a really long haul contact results from hours of patient listening and calling.

It is hoped that these tables will be useful and that they will, in some small measure, increase the pleasure of operating and result in the maximum benefit being derived from the various bands that are available.

If members do sustain regular communications outside the times indicated by the tables, it would be appreciated if they would forward details.

*18 *Fairfield Way, Barnet, Herts.*

March Predictions

BAND	NORTH AMERICA	CENTRAL AMERICA	SOUTH AMERICA	SOUTH AFRICA	NEAR EAST	MIDDLE EAST	FAR EAST	AUSTRALIA
28 Mc/s	1600	1530	1400	1145—1215	1215	1200	1230	0900
21 Mc/s	1600	1530	1145—1830	0900—1715	1130—1400	1200	1230	0900
14 Mc/s	1200—2030	1000—2100	0930—2100	0800—2000	0600—1830	0800—1700	0700—1630	0915—1400
7 Mc/s	2300—0200	2200—0200	2300—0800	2000—0200	2000—0600	2000—0200	1800—2300	0630—0730 1700—2100
3.5 Mc/s	2300—0800	0200—0500	0400	0330	2000—0400	0200	0200	0600

Council Proceedings

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, January 18th, 1955, at 6 p.m.

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

* * *

Welcome to New Members

The President, after extending a warm welcome to the newly-elected Members of Council (Messrs. Allen, Lane, Matthews, Metcalfe, Mitchell and Scarr), expressed the hope that the year ahead would be a happy and successful one in the history of the Society.

General Secretary Honoured

The President informed his colleagues that the General Secretary had been graciously honoured by Her Majesty The Queen, who had appointed him to be an Officer of the Most Excellent Order of the British Empire in the New Year Honours List.

Mr. Bartlett extended to Mr. Clarricoats the congratulation of the Council and assured him that the honour had given great satisfaction to members generally.

Mr. Clarricoats thanked the President and the other Members of Council for their good wishes.

Membership

Resolved (a) to grant Life Membership to Mr. E. R. Ayres (G8OS), (b) to elect 39 Corporate Members and 13 Associates, (c) to grant Corporate Membership to 32 Associates who had applied for transfer, including 7 whose original application for membership had not been proposed by a Corporate Member or supported by references, (d) to waive for a period of 12 months the subscription of Mr. S. H. Weaver on the ground that he suffers from blindness.

The Secretary reported that of the 941 members whose subscription became due on October 1, 1954, 202 became overdue on December 31, 1954. Of this number 25 were London, 92 were Country and 24 were Overseas Corporate Members and 61 were Associates. Of those overdue, 14 London, 49 Country and 18 Overseas Members held callsigns.

The Secretary submitted details of the 48 members (including 23 Associates) who had written to resign during the 5 weeks ended January 15, 1955. Only 7 had resigned on financial grounds. Of the remainder 10 had lost interest, 11 gave no reason, 10 did not wish to transfer and 10 gave miscellaneous reasons.

Banker's Orders

The Secretary reported that 911 members whose subscription became due between December 1, 1953, and November 1, 1954, had failed, notwithstanding several requests from Headquarters, to amend their Banker's Orders to provide for payment at the new rates.

Resolved that Regional, Zonal and County Representatives be asked to approach, privately, the members in their Region, Zone and County who had failed to amend their Banker's Orders.

Application for Affiliation

Resolved to grant affiliation to the Compton Bassett (R.A.F.) Amateur Radio Club.

Headquarters Station

Resolved to offer the Headquarters station to Mr. F. Ruth (G2BRH) for disposal at the best possible price.

Confidential Nature of the Proceedings of the Council

The President explained that the Proceedings of the Council were confidential until the Résumé of the Minutes of the preceding Meeting had been approved. Several Members expressed the view that the Proceedings should become common knowledge immediately after a meeting unless the Council ruled otherwise.

After discussion it was *Resolved* to adhere to the current practice, namely, that (i) the Proceedings of the Council shall remain confidential until the appropriate Résumé has been approved for publication, (ii) matters not referred to in the Résumé shall continue to be regarded as confidential.

Amateur Radio Exhibition, 1955

Resolved (a) to make a tentative reservation at the Royal Hotel for the week November 21-26, 1955; (b) to discuss the 1955 Exhibition at the February meeting of the Council.

Meeting in Birmingham

It was reported that the President of the Midland Amateur Radio Society (Mr. H. B. Bligh) had accepted an invitation extended to him by the Council to convene a meeting in Birmingham to discuss the R.A.E.N. and other matters of general interest to the Midland and Slade Radio Societies.

Resolved to authorize the President, Messrs. Milne, Cooper, Mitchell and the General Secretary to attend the meeting.

European V.H.F. Contest 1954

Resolved to present a miniature cup to the winner of the 1954 European V.H.F. Contest subject to the Secretary being satisfied that the winner was a fully paid-up member of his National Society at the time he won the Contest.

False S.O.S.

Apropos the matter referred to in the Proceedings of the previous meeting, a letter was submitted from the Commander-in-Chief, Home Fleet (Admiral Sir Michael Denny), in which he stated that (a) the original distress message bore the call sign of OH2AV/MM which is that of a "Finnish mobile *amateur* station," (b) the message was relayed to Niton W/T by a British *amateur* radio operator, (c) distress measures were then put into operation; three warships, seven merchant ships and one Royal National Institute lifeboat proceeded on search, (d) many hours later it was ascertained that the vessel reputedly in distress was still in harbour and had never proceeded to sea.

Admiral Sir Michael Denny commented "It is only natural that the mariner at sea in such circumstances should view with the greatest distress and disgust anyone guilty of originating false radio distress messages." Concluding his letter, Sir Michael Denny said "In my view any dismay at the press article felt by members of your worthy society, or its possible effect on their good name, falls to be compared with the good that results from a public understanding of the grievous

harm that may result from the improper use of radio in the field of maritime communication."

Mr. Milne reported that he had written to the Finnish Society asking to be advised whether or not the call OH2AV has been allocated to a Mobile Marine station.

Resolved to receive the letter from Admiral Sir Michael Denny.

420 Mc/s Tests and Contests

Resolved to publish a letter from a member in which he had criticized the Council and Contests Committee for deciding to delete the 420 Mc/s Tests from the 1955 Contests programme.

It was agreed that Mr. W. H. Matthews should reply to the letter in the same issue of the BULLETIN.

National Radio Show

Resolved to authorize the Secretary to advise the Radio Industry Council that the Society is prepared to participate in the 1955 National Radio Show on payment of a nominal sum for stand space.

Committees of the Council

The Committees of the Council for the year 1955 were constituted as shown in the list published in the February issue of the BULLETIN.

It was reported that Mr. C. Greenaway, who had been a member of the Contests Committee since before the 1939-45 war, and Mr. A. W. W. Timme, who had been a member of the same Committee for the past few years, had resigned.

The Secretary was instructed to write suitable letters of thanks on behalf of the Council to both Messrs. Greenaway and Timme.

Cash Account

Resolved to accept and adopt the Cash Account for December, 1954, as prepared by the General Secretary.

Reports of Committees

Resolved to accept and adopt the Report of the Contests Committee which met on December 9, 1954, and the Recommendation contained therein.

The Recommendation related to the award of the Victor Desmond Trophy to Mr. P. G. Day (G6PD), Winner of the Second Top Band Contest.

The meeting terminated at 9.55 p.m.

Application Forms

MEMBERS are reminded that application forms for the use of prospective Corporate and Associate members can be obtained on request from Headquarters.

T.R.s are invited to apply for a small supply of forms for distribution at local meetings or other functions.

London Lecture Meeting **Friday, March 25, 1955**

THE HISTORICAL DEVELOPMENT OF WIRELESS COMMUNICATION

By

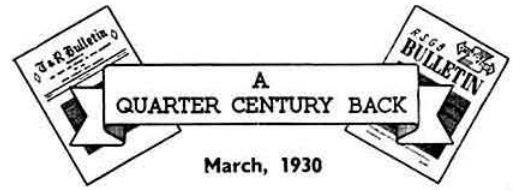
Maurice Child, Esq.

(Vice President)

at the

Institution of Electrical Engineers, Savoy Place, Victoria Embankment

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



A DESCRIPTION was published of "The R.S.G.B. Universal 3"—a battery operated receiver designed by the Editorial staff "with a view to reception on all bands from approximately 10 metres upwards." Valves recommended were the Mullard PM6D, PM5X and PM6. "On short waves the set brought in W2XAD and W2XAF (broadcast stations) at moderate loud speaker strength as well as a host of amateur telephony stations from all over Europe. Hand capacity effects were conspicuous by their absence and the receiver was found stable and easy to handle on all frequencies." B. & J. Wireless Ltd. supplied the coils, Wingrove & Rogers and T.C.C. the condensers and Pertrix the 160 volts h.t. battery.

* * *

The first of a series of articles entitled "Our Empire Stations" featured SU8RS and SU8WY, both of which were operated by British members of the Egyptian Signal Corps stationed at The Polygon, Cairo. SU8RS (operator Cecil Runeckles) used 46 watts derived from a 1,000 volts motor generator, battery driven. The transmitter used a modified Hartley with a Mullard T100 as oscillator. The receiver was an 0-v-2. "A screened grid h.f. unit has just been added and signals are at least 40 per cent stronger." SU8WY (operator Willie Wale) situated 300 yards from SU8RS, employed a Colpitts circuit with direct anode tap. "An AT120 is in use, whilst grid keying with an l.f. choke in the grid circuit was found to be the most satisfactory. Key clicks have been banished with this arrangement. The receiver used is a modified Schnell using two l.f. stages, the first transformer coupled and the second resistance coupled. A P.M.H.F. is used as detector whilst a PM2DX and PM256 follow in the amplifying stages."

* * *

Part 3 in the series "The Science of Television" by Maurice Gibson dealt in some detail "with the only really successful true-television system, namely the Baird system; the meaning of true-television only applying to the transmission and reception of living images. The heart of the whole system is undoubtedly the selenium or photo-electric cell by means of which the light impulses are converted into electrical impulses."

* * *

The meaning and calculation of impedance were explained by "Inconnu" in an article entitled "Engineering the A.C. Circuit" . . . Edward M. Uglow wrote about "Quality in Radio Telephony" . . . "Can the R.S.G.B. assist the Boy Scouts?" was the subject of an official statement from Headquarters . . . A District 2 Conventionette was held at the Mansion House, Rounday Park, Leeds, on February 22nd, with T. Woodcock (G6OO) in the Chair.

* * *

The death was announced of Mr. A. A. Campbell Swinton, F.R.S., M.I.E.E. "It was his efforts which largely brought the R.S.G.B. into being. In 1913 he undertook to be its first President, a duty which he continued when the Society was re-formed at the close of the (1914-18) war."

Society News

Investiture

AT the Investiture held in the Throne Room of Buckingham Palace on Tuesday, February 15, 1955, Her Majesty The Queen, invested the General Secretary (Mr. John Clarricoats) with the Insignia of an Officer of the Most Excellent Order of the British Empire.

At the same Investiture Lt.-Cdr. R. Brett-Knowles, G3AAT (Signals Officer to the British North Greenland Expedition) was decorated by Her Majesty with the Polar Medal.

London Lecture Meeting

MORE than 100 members were present at the Institution of Electrical Engineers on Friday, February 25, 1955, when Dr. R. C. Jennison (ex-G2AJV), of the Jodrell Bank Experimental Station (University of Manchester) lectured on "Radio Astronomy and the Radio Amateur." It is hoped to publish a precis of the lecture in an early issue of the BULLETIN.

Mr. Arthur O. Milne (Immediate Past President) deputised for the President (Mr. H. A. Bartlettt) who was prevented from attending, due to severe weather in the West Country.

After an informative discussion Mr. F. J. H. Charman, B.E.M., G6CJ (Past President) proposed a vote of thanks to the lecturer.

Lecture-Tape Library

THE Society acknowledges, with grateful thanks, the gift by Electric and Musical Industries, Ltd., of twelve 1200ft reels of their latest Type 88 Emitape. These tapes will be used for making recordings of lectures given to groups of R.S.G.B. members so that such lectures may be reproduced in other parts of the country.

Bristol Convention Film

THE film taken during the R.S.G.B. National Convention held in Bristol last September is now available for showing to groups of R.S.G.B. members and to Affiliated Societies. The film, 16 mm. silent, runs for about 15 minutes.

Applications for the loan of the film should be addressed to the Society's Honorary Film Curator, Mr. L. S. Gillham, 2 Parkstone Avenue, Hornchurch, Essex. A choice of dates should be included in the application.

The Journal of the Wireless Society of London

THE General Secretary will be glad to hear from any member who is in a position to supply the Society with the several issues of "The Journal of the Wireless Society of London" which bear the reference Vol. I. As far as can be ascertained these issues appeared during 1920 and 1921 and in all cases were reprints from the *Wireless World* which was then the Official Journal of the Society.

The following later issues are also required: Vol. II. Parts 1, 2, 3, 8 and onwards. Vol. III. Parts 2, 4 and onwards.

Society Tie and Blazer Badge

ABOUT four years ago, as the result of enquiries received from members, Headquarters invited a well-known Manchester firm of tie makers to quote for a special Society tie. The quotation, whilst quite reasonable in price, required the Society to place an order for a minimum quantity of 18 dozen. In view of that fact and in order to assess the likely demand, the Council decided to invite interested members to send a postcard to Headquarters. Unfortunately, the response was so poor—less than two dozen members wrote—that the project had to be dropped.

At frequent intervals since that time Headquarters have received enquiries from members concerning the possibility of the Society offering not only a tie but also a blazer badge. In order, therefore, once again to assess the probable demand, members interested in either or both projects are invited to send a *postcard* to R.S.G.B. Headquarters. T.R.s are requested to bring this enquiry to the notice of members at local meetings and to send in a postcard covering the probable requirements of the group.

It is anticipated that a rayon tie would cost about 12/6 and a silk rayon one about 15/-. A blazer badge would probable cost between 12/6 and 15/-.

I.A.R.U. News

THE December, 1954, issue of the Calendar of the International Amateur Radio Union records that the R.S.G.B. proposal to adopt the RSM Code, as approved by the Region I Division of I.A.R.U., has been adopted by 22 votes to 3. The A.R.R.L. voted against the proposal on the ground that the Code as set up is impractical for amateur usage. The League contend that very few amateurs are capable of judging whether defective modulation is due to spurious or parasitic oscillations or to frequency modulation or to over-modulation. Additionally, as a general policy, the League favours a minimum of special codes for telephony work.

A proposal to reinstate the Japan Amateur Radio League to membership in the Union was carried by 25 votes to none opposed.

The Calendar contains a proposal that the Radio Club of Bolivia should be admitted to membership. (The R.S.G.B. has cast an "Aye" vote in favour of the proposal.—Ed.). Following a request from the R.S.G.B., Union Headquarters have agreed to amend the W.A.C. Certificate boundaries to allow a contact with the Island of Socotra (150 miles off the eastern tip of Africa) to count as a contact with the continent of Asia rather than with the continent of Africa.

It is reported that the Australian Government has recently introduced a limited Amateur Operator's Certificate of Proficiency which allows those qualified technically to operate on 144 Mc/s and higher frequencies without having to pass a code test.

The following Societies have just completed a quarter-century of membership in the I.A.R.U.:—N.Z.A.R.T. (New Zealand); N.R.R.L. (Norway); E.D.R. (Denmark); S.S.A. (Sweden); U.S.K.A. (Switzerland); and I.R.T.S. (Ireland). Another Silver Jubilee is that of the Calendar itself. The first Calendar appeared in 1929. Present Member Societies on the roll at that time were A.R.R.L.; Canadian Section, A.R.R.L.; R.S.G.B.; A.R.I. (Italy); R.E.F. (France); S.A.R.L. (South Africa); and W.I.A. (Australia), with the predecessors of the following present Member Societies:—U.R.E. (Spain); V.E.R.O.N. (the Netherlands) and the U.B.A. (Belgium).

The Calendar lists dates and times of various international Contests organised by I.A.R.U. Societies. The list is largely a record of R.S.G.B. Contests and similar events.

HAVE YOU AMENDED *YOUR* BANKER'S ORDER?

The R.S.G.B. in Retrospect

1948—1950

By C. H. L. EDWARDS (G8TL)*

New Technical Booklets

THE following year, 1948, under the Presidency of Mr. V. M. Desmond, G5VM, saw the membership still rising—the grand total being 13,870. Undoubtedly, the surplus transmitter scheme had had something to do with this rapid increase. The *Handbook* and *Supplement* were now out of print, and the decision to break up the type was taken after 304,500 copies of the two publications had been sold. The first of a series of new Technical Booklets—intended to fill the gap before a new *Handbook* appeared—was *Microwave Technique*. Two further booklets—*Valve Technique* and *V.H.F. Technique*—appeared shortly afterwards.

The TVI Problem

Now that television was well established in London and the Home Counties, letters began to reach Headquarters from transmitting amateurs who had been advised by the G.P.O. to close down during TV hours because they were interfering with neighbouring viewers. The R.S.G.B. had for some years past realised that difficulties were likely to arise because of the harmonic relationship between the frequency of the London Television transmitter and certain amateur frequencies and had pressed the Post Office to quote the maximum permissible harmonic field strength, so that amateurs in the fringe areas would have some definite figure to work on. The G.P.O. were, however, not prepared to quote a specific figure but agreed to treat each case on its merits. At about this time the Society asked the G.P.O. to allow amateurs to operate in the industrial, scientific and medical bands, but after some discussion this was refused, as was a request for maritime mobile operation in the 21 Mc/s band.

Since the end of the war more than 50 local societies had become affiliated to the R.S.G.B., and in order to provide some form of competition it was decided to organize an inter-Affiliated Societies' Contest. National Field Day Rules for 1948 included one which limited the input to the final valve to a maximum of 5 watts. Much argument ensued but the rule remained, and, as usual, all the disputes were forgotten on the day and "a good time was had by all".

A further booklet—*Transmitter Interference*—was produced, and 10,000 copies ordered. Another meeting between the G.P.O. and the Society's Liaison Committee brought the release of the 145—146 Mc/s and the 420—460 Mc/s bands. Complaints by the Society regarding interference in the 28 Mc/s band by "radio sonde" balloons were investigated, and in consequence all meteorological stations were informed of the necessity to avoid interfering with amateur stations working on those frequencies. The Second Amateur Radio Exhibition, held at the Royal Hotel, London, in November, was opened by Dr. R. L. Smith-Rose (Director of Radio Research, D.S.I.R.).

The Society, in an endeavour to help the amateur in the television fringe areas, suggested to the British Radio Equipment Manufacturers' Association and the Radio and Television Retailers' Association that the sale of television sets should be restricted to the normal service area of the London station. The Society also put forward suggestions regarding the establishment of a protected limit of field strength. An encouraging reply was received but nothing much emerged.

In December, the G.P.O. announced that the Society's request for the release of further frequencies had been granted, these being 144-145 Mc/s, 1215-1300 Mc/s, 5650-5850 Mc/s and 10,000-10,500 Mc/s. Frequency as well as amplitude modulation was now permitted from 420 Mc/s upwards, with an input power of 25 watts. The number of licences issued by the G.P.O. increased by 1,200 during the year, making a total of 6,750.

No fewer than 700 candidates sat for the Radio Amateurs' Examination and of that number 528 were successful. The call sign GB3RS was issued to the Society for use when the Headquarters' equipment was operated as an amateur station.

1949

In 1949, with Mr. Victor Desmond still President, membership rose to 14,429—an all-time record.

Pressure was exerted on the Post Office for the release of the 21 Mc/s band but without success. In the House of Lords during the second reading of the Wireless Telegraphy Bill, Lord Sandhurst made some interesting and knowledgable observations about radio amateurs. "We in this country have a person known as the 'wireless amateur', commonly called a 'ham'. These amateurs work on short waves and are particularly liable and susceptible to interference. They are a valuable asset to the country, they are the breeding ground for our operators of the future, and they are the people who need protection far more than the ordinary household broadcast listener".

Because of the demands for frequencies between 40 and 60 Mc/s for television the 56-60 Mc/s band was lost to the Amateur Service as from midnight on March 31, 1949.

With the Festival of Britain planned for 1951, the Society enquired if there was any way in which it could participate. The Festival Authorities suggested that an amateur station should be operated from the South Bank site and a small Committee was formed to investigate the possibilities.

A Regional Representatives' Conference to discuss the Scheme of Representation was held in Birmingham and a second Old Timers' Dinner in London attended by seventy-five Old Timers.

The Proceedings of the R.S.G.B.—first published during the paper shortage—was discontinued because the R.S.G.B. BULLETIN was gradually becoming larger, typical issues running to 24 pages.

In April, 1949, Mr. A. E. Watts, the Society's G.P.O. Liaison Officer for nearly twenty years, resigned from that Office. The Society will always be grateful to him for maintaining good relations with the Post Office throughout that period and for his work at both the Cairo and Madrid I.T.U. Conferences.

The Society again requested the G.P.O. to permit an increase in power on the v.h.f. and u.h.f. bands from 25 watts to 150 watts, a request granted later in the year for all bands above 28 Mc/s, except 420-460 Mc/s where the maximum remained at 25 watts.

The Royal Naval Volunteer Wireless Reserve was re-established on a peace time basis during 1949 and a drive for recruits from the ranks of the radio amateurs took place.

Nearly 700 members attended the luncheon at the first post-war National Convention of the Society held at Belle Vue, Manchester, in October. An Amateur Radio Exhibition, held at the Corn Exchange, Manchester, in connection with Convention was well sup-

*28 *Morgan Crescent, Theydon Bois, Essex.*

ported by the radio trade. Much of the success of the event was due to the work put in by Mr. Ian Auchterlonie (G6OM) and other members of the Convention Committee.

During the year, two new booklets—*Receivers* and *Simple Transmitting Equipment*—were published. Lord Sandhurst opened the Third R.S.G.B. Amateur Radio Exhibition at the Royal Hotel. An entrance fee of 6d. was charged and the exhibition showed a profit to the Society of £150.

With the coming into force of the Town and Country Planning Act, 1947, several amateurs became involved in litigation regarding aerial masts and towers erected on their premises. The Society took legal advice and sent representatives to watch the interests of members at local inquiries.

1950

In January, 1950, Mr. W. A. Scarr, M.A. (G2WS), became President. During that month the Air Ministry accepted proposals put forward by the Society some time earlier in respect of aircraft distress messages. The Ministry agreed that after all normal distress procedure had failed, aircraft radio operators would, in such circumstances, call on a frequency within the 7000-7150 kc/s amateur band. Calls intercepted by amateurs were to be telephoned to the nearest Police Station. The scheme was approved by the G.P.O.

Twenty-fifth Anniversary of I.A.R.U.

In May, 1950, the twenty-fifth anniversary of the formation of the International Amateur Radio Union was celebrated by a Congress in Paris, the R.S.G.B. sending a delegation of six members. Matters considered were future I.T.U. Conferences, band planning, operating techniques, contests, and the regulations affecting licences in different countries.

By a unanimous vote the R.S.G.B. was requested to represent the interests of I.A.R.U. Member Societies in Region I and it was suggested that a Bureau should be established for that purpose at the London Headquarters of the Society. The U.K. delegates estimated that the cost of running the Bureau would be not less than £500 p.a. and expressed the opinion that the Council of the R.S.G.B. might be willing to accept financial responsibility for one year but not indefinitely. (That viewpoint was subsequently accepted by the Council.) The Conference agreed that there were too many international contests, several of which clashed with one another. It was left to the Region I Bureau to work out a plan which was to be submitted to each National Society for approval later.

A proposal was made that a further meeting should take place at a date nearer the next International Radio Conference to decide the all-important question of the number of delegates to represent the I.A.R.U. and the sharing of costs incurred by their attendance.

"*In the Workshop*" and "*Bright Ideas*" were new features in the BULLETIN, while Mr. Louis Varney (G5RV) contributed important articles on the suppression of TVI.

The Committee set up to investigate the possibilities of taking part in the Festival of Britain reported that it would not be possible to install and man an Amateur Radio Station on the South Bank site.

The Post Office refused a request from the Society for permission for amateurs to transmit television in the 420-460 Mc/s band but they stated they would be prepared to issue experimental licences on the merits of each case put forward. The G.P.O. also informed the Society that they had decided to abandon the revision of the then current licence. Instead, a new licence was to be produced and the Society would be given an opportunity of commenting on it. The Society protested about the operation of broadcasting stations in the 7 Mc/s band. In their reply the G.P.O. said that they, too, were anxious to improve the position but added that little could be done until the provisions of the Atlantic City frequency plan had been fully implemented.

Later in the year, Lord Waleran, in the House of Lords, and Mr. C. I. Orr-Ewing, M.P., in the House of Commons, raised the question of Amateur Television, with the result that channels were made available in the 2,300, 5,650 and 10,000 Mc/s bands. As a result of representations made by the Society, the G.P.O. agreed to allow the use of m.c.w. by new licencees during their first year on frequencies of 420 Mc/s and above.

After consultation with the Regional Representatives concerned, a suggestion, put forward by the Festival of Britain Authorities that the Society should arrange for an Amateur Radio station to accompany the Land Travelling Exhibition, was accepted.

After the loss of the trawler *Milford Viscount*, the Society made an offer to the Ministry of Transport to place the experience and equipment of British radio amateurs at the disposal of the authorities should there be a similar incident in the future. The offer was later declined with the Minister's thanks.

The Sound Recording Board of Directors of the National Institute for the Blind and St. Dunstan's asked Headquarters if it would enlist the aid of members willing to advise present and future users of the Talking Book Library in the correct operation of record players. Many volunteers came forward and the service is still in operation.

As the result of representations made by the Society, permission to use telephony on frequencies of 420 Mc/s and above was granted to newly licensed amateurs during their first year.

During 1950, the contract for the printing of the BULLETIN, which for many years had been carried out by Sir Joseph Causton & Sons Ltd., was awarded to the South London Press Ltd.—a change which saved £1,200 a year.

The Postmaster General, the Rt. Hon. Ness Edwards, P.C., M.P., was amongst those who visited the Fourth Annual R.S.G.B. Amateur Radio Exhibition opened in November by Mr. Hugh Pocock, M.I.E.E., Managing Editor of the *Wireless World*. Mr. Edwards showed keen interest in a demonstration of Amateur Television and asked that his congratulations be conveyed to those whose ingenuity and ability had produced such outstanding examples of first-class design and workmanship.

The End.

Editorial Note

Members who would like to purchase a copy of "The R.S.G.B. in Retrospect", if made available in book form at a price not exceeding 2/6, are asked to communicate with the General Secretary.

Around the Trade

G.E.C. Airport Electrification is the title of a new brochure just published by The General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.2. The general principles involved in airport electrification schemes are first explained; details are then given of various types of G.E.C. equipment now in use at airports. There is a large coloured diagram showing the lighting layout for a typical airport. A copy of this beautifully produced publication can be obtained on application to the above address.

Mobile Column

By JOHN A. ROUSE (G2AHL)*

EFFICIENCY in mobile transmitters cannot be measured solely by the amount of r.f. output obtained for a given drain from the battery. It is of the utmost importance to obtain the very best results from every section of the equipment. As practically all mobile work is on phone, it is essential to make the most effective use of the modulator. It is a well-known fact that about half the energy in speech is at frequencies below 500 c/s and that intelligibility is conveyed by sounds between 500 c/s and 2500 c/s. Reduction or elimination of sounds outside this frequency range is, therefore, desirable.

The simplest method of reducing the low frequency response is to use small coupling condensers in the speech amplifier. As explained in the *Radio Amateur's Handbook*, a time constant of 0.0005 second for the coupling condenser and the grid resistor of the following stage has little effect on amplification at 500 c/s but will almost halve it at 100 c/s. Typical values for the components concerned are ½ Megohm for the resistor and 0.001 μF for the coupling condenser. High frequency response can be reduced by connecting a 0.001 μF condenser direct from the anode of the first valve in the speech amplifier to earth, by more elaborate "tone control" methods, a low pass filter or by "building out" the modulation transformer with suitable condensers.

Practical examples of modulators incorporating such frequency restriction are given in the *Radio Amateur's Handbook* and the *Radio Amateur's Mobile Handbook*. A design for the home station, to which the ideas are equally applicable, was described in an article by George Jessop (G6JP) in the January, 1955, issue of the BULLETIN.

While on this subject it is perhaps worth mentioning that there appears to be no source of supply of small modulation transformers for mobile use. Those in the SCR522 transmitters are, of course, suitable, but the surplus stocks seem to have been exhausted. Any member who knows of a type readily available is invited to send details for inclusion in this column. An article on their home construction would be a most useful addition to the literature.

Mobile Rally

The suggestion put forward last month by G5CV has aroused considerable interest. One idea, which certainly merits consideration, is that the rally should be held in Stratford-on-Avon, which, apart from being a point fairly easily reached, is a centre of historic and cultural interest offering excellent facilities for all concerned. Comments will be welcomed.

Notes and News

G3BID/M (London, N.W.3) has been active since November last, and whilst on the road has worked EA1FU, EA4EP, CT1OR and YU1GM on 14 Mc/s using 35-40 watts to a single 807 and a 12ft whip. The equipment is mounted in the back of a "utility", and power is derived from the car battery or from a separate 12 volt accumulator. CN8ML, CT1HL, CN2AW and YV5EC have been worked whilst stationary. '3BID also operates on 21 Mc/s. He records his thanks to the many British stations who have helped with reports and comments.

G3GXZ/M (R.A.E.N. E.C.O. for South Wigston, Leics.) is active on Top Band using a transmitter comprising a 6J5 v.f.o., 6SH7 buffer-doubler and 6V6 p.a., anode and screen modulated. The input is 10 watts. The aerial is a top loaded 3ft whip, the loading coil being wound with 32 s.w.g. enamelled wire on a $\frac{5}{16}$ in. diameter dowel to a total length of 8in. A Collins TCS receiver is used. H.T. is derived from a rotary converter. Tests show that the signal is RS58 within a radius of 15 miles and RS56 at 20 miles. Considering the small aerial used, these results are excellent.

G5KW/M reports that both he and **G8KW/M** hope to be operating mobile on 420 Mc/s shortly. '5KW has bought an old taxi which is being fitted out as a mobile Amateur Radio station, complete with telescopic mast. **G2DHV/M** expects to be active soon and will be on the Norfolk Broads in the early summer.

The ZC1 Mk II Again

Apropos our remarks last month regarding the New Zealand ZC1, **G3IIR/M** points out that it is not necessary to make up a new microphone cable in order to cure the vibrator ripple in the speech amplifier. The original cable is, in fact, four way with one lead cut off short. If the insulation is stripped back a short distance the fourth wire can be brought into use to provide an independent earth return for the press-to-talk circuit from the microphone jack plug. This has the effect of removing the common impedance which causes the trouble.

* * *

From remarks and discussions heard on the air, it seems evident that great preparations are being made for mobile and portable operation during the coming spring and summer. If *you* are active, or about to be, please send details as soon as possible for inclusion in the next "Mobile Column" (May issue). Hints and tips born of practical experience will be particularly welcome.

To those who contributed this month, grateful thanks.

*Assistant Editor, R.S.G.B. BULLETIN.

Radio Astronomy

A PAPER on Radio Astronomy by A. C. B. Lovell, O.B.E., Ph.D., F.Inst.P., F.R.A.S., Professor of Radio Astronomy, University of Manchester, and Director of Jodrell Bank Experimental Station, will be delivered to the Royal Society of Arts, John Adam Street, Adelphi, London, W.C.2, at 2.30 p.m., on Wednesday, March 23, 1955. Sir Ben Lockspeiser, K.C.B., F.R.S., Secretary, D.S.I.R., will preside. The paper will be illustrated by a film and lantern slides.

Applications for tickets should be addressed to the Secretary of the Royal Society of Arts.

Experimental Band III Transmissions

IN a statement issued to the Press, Belling & Lee, Ltd., who are to operate an experimental transmitter in Band III from next month, draw attention to the fact that nowhere in the world has a vertically polarized positively modulated transmission been used before for television on these frequencies. The results of the experiments to be carried out from the Croydon site will, therefore, be particularly interesting.

New Tuning Indicator

MULLARD, LTD., has announced the production of a new "magic eye" tuning indicator (type EM80) in which the luminiescent screen is viewed from the side, thus making the area of display quite large and clearly visible over a wide angle although the valve is a miniature all-glass type. It is for use in a.c. mains operated broadcast receivers.

Amateur Television

By M. BARLOW (G3CVO)*

WINTER is always a good time for constructional and experimental work, and preparations are now well advanced for the coming demonstration season. Long-term experiments on propagation are continuing with G3GDR and G2WJ/T regularly passing pictures on Saturday nights. Tests are being made in an attempt to obtain an estimate of signal strength received by counting the number of 10 kc/s beat notes produced on either side of the main carrier when vision is being transmitted. This is only a rough guide, of course, and depends on the picture content, but when 15 or more beats can be heard on each side of the carrier, a picture is usually resolvable provided the converter is a good one. If not, a bigger and better aerial is indicated. G3GDR and G2WJ/T both use 64 element stacks. At G3CVO, where a 16 element array is in use 25ft up, signals from G2WJ/T are still weak. Patterns can be perfectly resolved but live pictures are not so successful. The path lengths from G3GDR and G3CVO are about 32 miles and 12 miles respectively from G2WJ/T. This gives an indication of the difficulties involved in receiving pictures even over comparatively short distances.

Sub-carrier for Sound

Another experiment is being carried out to determine whether or not the sound channel can be successfully transmitted on a 3.5 Mc/s sub-carrier in such a way that both sound and vision are received on a normal television set using a 430 Mc/s converter. This necessitates only one transmitter, although if there *should* be a breakdown sound and vision both disappear. Although restricted audio bandwidth is quite acceptable for amateur work, harmonics of the 50 cycle frame pulses must be avoided; the problem is a most interesting one.

Notes and News

C. G. Dixon (Ross-on-Wye) has taken some very impressive colour photos to prove the success of his colour experiments. G2DUS/T (Baldock) has built a 405 line sync. generator and 45 Mc/s distribution unit into a TU6B box; a similar box contains a test card "C" monoscope. 70cm. tests with the CV82 continue. B.R.S.17902 (R.A.F. Henlow) has built a double i.f. 420 Mc/s converter, the intermediate frequency being 16 Mc/s for communications work and 45 Mc/s for vision. An R.F.105 unit acts as local oscillator, tuning 380-439 Mc/s. A. Critchley (St. Annes) has formed a local club and membership is increasing. He has built a flying spot transparency scanner with a 3FP7 scanner tube. John Adams (Iver) is constructing a 16mm. telecine scanner after the Philco pattern, in which the film is wrapped round a glass polygon, the advantage being that a picture is always produced no matter at what speed the film is running, whereas in the more common E.M.I. system the film must be running in synchronism.

A. Sale (Rayleigh), having erected a 5-over-5 array on a scaffold pole to clear local overhead cables, is now able to receive G2WJ and G3CVO on 420 Mc/s sound. His highly unorthodox converter (2in. square by 1in. deep) is mounted at the rear of the aerial. 390 Mc/s local oscillator injection is fed up the cable from below, the 45 Mc/s i.f. signal and crystal current being fed down, suitable filtering sorting everything out. Results are very good, no deterioration being noticed over a more conventional converter. P. Burrage (Saxmundham) is another economist—for his Staticon camera he is feeding sync. pulses one way down a co-axial cable, and getting suppressed video back again. B. Partridge (Bishop's Stortford), with the help of some friends, is building a Staticon camera. The transmitter is almost completed. The sync. unit produces a perfect raster even when only the blanking pulses are used. He hopes to be on the air shortly. D. Reid (Chelmsford) has completed the coils for a Staticon, whilst R. Martyr is struggling with corner reflectors on the top of a tall mast in order to receive G3CVO, whose pulse generator (partly completed) will use, in theory, only 8 valves to generate a full B.B.C. waveform. Ancillary equipment such as a production console, stabilized power supplies and a 5 channel r.f. distribution unit have been built. A new vision transmitter with a QQV06/40 in the p.a. is under construction. The modulator will be a small-scale version of that to be used in the new Crystal Palace station!

G3AST (Luton) has built a 35 mm. filmstrip scanner, using a 3FP7 with 5,600 volts (!) on the anode. Results are superior to those with a G.E.C. "E4" screen, although the spot size even with this e.h.t. is rather large. He recommends a dip in Engineers' Marking Blue for double layer screens, as this increases the contrast considerably. Two portable monitors using VCR517c tubes, and a new pulse generator have been constructed. GI3FWF/T (Lisburn) is using a VCR517c for scanning at 3 kV. Pictures are very good in spite of a rather high noise level. A G3BKQ-type 420 Mc/s converter was tried, but as the tuning was excessively sharp, the crystal tap was moved to the "hot" end of the line and the injection changed. A G3HAZ-type 8012 trebler was not successful due to lack of 2m drive. Video transmissions are on 438 Mc/s weekdays only during the winter. G2FKZ (Dulwich) has had to rebuild the transmitter power packs to handle peaks correctly. Video signals should be available in the early summer.

*10 *Baddow Place Avenue, Gt. Baddow, Essex.*

"Permabit" Soldering Irons

CONVENTIONAL copper soldering iron bits periodically require tinning and re-shaping, with the result that they wear out rapidly in constant service. To overcome this difficulty, Light Soldering Developments, Ltd., are now manufacturing "Permabit" instrument type irons with permanent bits which require no maintenance other than an occasional quick wipe with a piece of cloth. Similar in size to the "Litesold" fixed and replaceable bit irons, "Permabit" instruments are available for use on voltage ranges from 6-7 V to 230-250 V, a.c. or d.c. The lower voltage types should prove particularly useful in toolkits for portable or mobile use, as they can, of course, be operated from car batteries.

* * *

W. T. Henley's Telegraph Works Co. Ltd., 95 Aldwych, London, W.C.2, have recently issued a booklet dealing with radio frequency cables of their manufacture. Details are given of coaxial solid, twin solid and coaxial air space types, as well as different types of television feeder cables. A copy of the booklet (No. 498) can be obtained on application to the above address.

Broadcast Receiving Licences

DURING January, 1955, the total number of broadcast receiving licences in the United Kingdom rose to 13,903,950, including 4,307,772 for television, and 263,741 for car radios.

Tests and Contests

First Top Band Contest, 1955

ALTHOUGH the number of entries for the First Top Band Contest, 1955, on January 15-16, reflected the cold weather and the patchy conditions (deep fading and a high noise-level), some 300 stations are known to have been active. By successfully working more than half of these, Mr. P. G. Day (G6PD) of Knebworth, Herts—winner of the November, 1954, Contest—joins the elite few who have won two successive Top Band Contests. This time his transmitter was an EF91 v.f.o.-EF91 b.a.-5763 p.a.; it excited a dipole aerial to no mean purpose, while a BC348 sorted out the medley of incoming signals. G8GF of Brierley Hill, Staffs (6J5 e.c.o.-807 p.a.; half-wave end-fed; HRO), climbed from fifth to second place; G8KP of Wakefield, Yorkshire (6L6 v.f.o.-807 p.a.; 270ft end-fed; AR88) had to be content with third place.

European participation was lower than in November, with only HB9CM and OK1HI turning up regularly in the logs. The new scoring rates did not encourage DX chasing and, despite the seemingly inevitable overlapping with the Transatlantic Tests, no American contacts are reported by contestants, although G6BQ logged W1BB, '1BJP/1, '1SFE/1, '2GGL, '8ANO and K2BWR. Sudden increases in the signal strength of certain U.K. stations during times when the DX was coming in did not pass unnoticed, though on this occasion let us be charitable and say that it must have been due to the improvement in conditions!

An encouraging sign for the future is the keenness of the newer licensees—more than 50 stations in the G3J-series were about, many of them handling their equipment with the aplomb and operating skill of the regular contestants. The presence of so many newcomers gives point to the comment of one participant that "some stations would do well to reduce speed to 20 w.p.m. and send their call three times instead of thirty three."

The high percentage of those who found that the high noise level, and thawing snow on the feeders, made bed seem unusually attractive, gave added weight to the need to get off to a flying start while there were still plenty of stations about. G6PD, for example, exceeded 30 contacts in each of the first two hours, and had, in fact, piled up almost half of his final score by the end of the third hour. Stations in the more distant regions find this early period particularly frustrating as they feel that there is a tendency for stations in the more populous areas to concentrate on the louder signals. It was perhaps partly for this reason that although seven GM stations were active, no official entries were received—this is the more unfortunate since it means that no recommendation can be made in respect of the new Maitland Trophy for Scottish stations until next year. This problem—together with the highly controversial matter of the best length of the event—will be fully reviewed before the rules for the next Contest are drawn up.

Miss Ann Walford (G3GOX), although able to operate for only a limited time with a single-stage crystal oscillator, set an example that many OMs might follow by submitting an entry.

Check Logs

Useful check logs are acknowledged from: G2HKU, '3SB, '3ETP, '3GFG, '3HCN, '3HKO, '3IZI, '3JZQ, '6CJ, GI3HCG, GM3EHI and GW2HH.

Results: First Top Band Contest, 1955

Posn.	Call Sign	Points	Posn.	Call Sign	Points
1	G6PD	166	29	G3HDZ	76
2	G8GF	162		G4ZZ	76
3	G8KP	156	31	G3DWQ	74
4	G3BMY	155		G3IXX	74
5	G6HD	137	33	G3JII	72
6	G5TN	136	34	G3JIA	71
	G3ERN	136	35	G3IRL	69
8	G6BQ	134	36	G3GSZ	67
9	G2JF	131	37	G3JJG	66
10	G3IEW	128	38	GC3HFE	64
11	G6VC	124	39	G2KK	60
12	G3JML	116	40	G2HCZ	57
13	G3FMZ	115	†	G8JM	56
14	G3IGW	112	41	G3nWS	54
15	G3HQQ	110	42	GD3UB	52
16	G5SX	106		G3FAS	52
	G3ELZ	106	44	G2HOX	51
	G3YF	106	45	G3JVK	50
19	G3AZ	105	46	G3HTI	48
20	G5MR	104	47	G2ZR	46
21	G3FST	103		G3JFT	46
22	G3ABB	100	49	G3GOX	39
	G4NJ	100	50	G3DGN	38
*	G4BP	97	51	G3CO	37
24	G3HIW	97	52	G4DHV	36
25	G3JSK	93	53	G2AOL	35
26	G4CM	90	54	G2BLA	23
27	G3FZC	78	†	G2ABK	21
	G3BKE	78	55	G3JWT	19

* *Entry Invalid—Two operators.* † *Entry Invalid—No declaration.*

National Field Day
Important Rule Changes

OWING to misunderstandings which arose during 1953 and 1954 in the case of the Sutton and Cheam N.F.D. entries, it has been decided by the Council, acting on recommendations made by the Contests Committee, that the rules relating to working stations in the same Group or locality shall be changed. It has also been decided that contacts with mobile stations shall be permitted and shall count three points. The amended rules are set out below.

Amended Rules

(17.) Only one contact per band with a specific station during the contest will count for points. For the purposes of this rule G2XXX, G2XXX/A, G2XXX/M and G2XXX/P are all regarded as the same station.

(18.) An N.F.D. station may work any other station (portable or otherwise) provided that the operator of that station is not a signatory (operator or official entrant) of the N.F.D. entry (either A or B log) concerned.

(The original wording of Rules 17 and 18 is now cancelled.)

Addition.

(19.) C.—Between competing stations and mobile stations—

(a) Within the British Isles . . . . 3 points.

* * *

On the instructions of the Council the points claimed in the 1954 Sutton and Cheam entry for contacts with those members of that Group who did not reside within the official boundaries of the Group have been restored. Their score now reads: "A" station, 1.8 Mc/s. 201 points; 3.5 Mc/s, 242 points; total, 443 points; "B" station, 7 Mc/s, 224 points; 14 Mc/s, 40 points; total, 264 points; combined total, 707 points; position now 36th.

The Ant

Described by its Inventor, G. Toose-Edy

In response to requests from far and wide, the BULLETIN publishes this authentic description of "The Ant," that mysterious device which attracted so much attention at the 1954 R.S.G.B. Amateur Radio Exhibition.

The photograph reproduced herein in its hard black and white tones provides but a poor impression of "The Ant" as it was seen by the spell-bound thousands who stopped and stared at the colourful original, vibrant with life. Incidentally, "The Ant" might never have seen the light of day if "Eddie," G8TL, had not swiped it from the inventor's workshop late one night just before the exhibition opened.

HOW did The Ant all start? Well, how often have you heard of the "soup going up the Ant"? But have you ever *seen* it? No, of course not. If you use a meter, you can't see through the dial and even meters don't tell the truth, as the G.P.O. well knows. Then there is the flash lamp: you don't see the soup going anywhere, it is staying in the bulb. But with this new invention you see it going up The Ant "before your very eyes".

Some criticism was levelled at the exhibit because there was no wick to turn up. There was, but unfortunately it was still in the metaphorical, metaphysical, fourth dimensional stage and had not, as the soup, been brought into 3D. It was there alright but someone had turned it up and the soup had shot right through The Ant. Nevertheless, it was very much true to life for surely you've noticed soup dripping from the ends of some aerials when the owner has been calling CQ in a bottomless void or working that DX station no-one else can hear. Or is the drip at the other end? By the way, did you notice the piece of wet string properly insulated?

As a sop to the 5RV followers there was the harmonic trap larger than life but anyone in the know agrees that the bugs get through. Here you could see them but they ended up in a proprietary line—Abol Ant Killer which was suitably modified to Ant Filter.

"The Ant" showing the Grounded Grid, the Plate Link, the Piece of Wet String, the Balun, the Gugar Counter, the TVI Bug Filter and the Ant Powder to keep the bugs off the Ant.

The grinding noise you heard was to be expected; you can't expect a continuous line of bugs to die without a moan. So you see it wasn't necessary to resuscitate old Collin's coupler, even if you rename it pi—or should it be pies.

Since they put that black muck on the inside of valves, you've forgotten what a plate looks like (Old Timers please read anode) but here you see it again and genuinely link coupled—not half heartedly with a loose sort of coil somewhere in the vicinity. And the Ant terminated in a balloon.

The masterpiece, however, was the Big Switch—pull it and the bugs stopped—but did the soup stop going up the Ant, no! Now everybody is interested to know how the soup could still go up whilst the bugs stopped, but that information must be withheld.

Technical Details

Carbon tetrachloride (Pyrene to you) is just the thing for electrical fires and the exhibit stood some risk of that. Pyrene boils at 72° C. 24 volts through a resistance of the order (wonder boys' jargon) of 60 ohms shot the soup through the Ant, 20 volts was hardly enough so (clever this) 22 volts was about right. Just a spot of dye made all the difference—like hotel soup. A d.c. motor of doubtful characteristics took the mains on the fields; short the brushes and (maybe) you've got an induction motor and no TVI (crafty one that). Big Switch across brushes; closed=ergs, open no ergs; no ergs, no bugs=ergo of bugs as opposed to ergo of rye. Meccano 52 tooth gear wheel and worm wheel to suit comfortable bug speed (one you can read) and Meccano cut holes in their gadgets—hole=no contact therefore blinking eyes in Ant (that seems Queen's English).

Well, that's it, all yours, but don't follow it too slavishly. By the way, there was no dummy aerial because that was a fraud, even the G.P.O. knows that now, and any G2 plus three letters knows that they were handed around against G.P.O. calls or retained for purely local QSOs.

Slow Morse

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

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

Pirates Fined

EARLY in February, Sheffield magistrates found two people guilty of operating radio transmitters without licences, according to a report in the Sheffield *Star*.

In the first case, the defendant operated a radio transmitter without his son—a licensed radio amateur—being present. The son, it appeared, had ceased to reside at his parents' home. A fine of £10 was imposed, plus £3 3s. 0d. costs. The second defendant was fined £2 for a similar offence and £2 for installing a transmitter without a licence, and was ordered to pay £3 3s. 0d. costs.

Mr. G. H. Swann, prosecuting, said that the maximum penalty in cases of this nature is three months' imprisonment, a fine of £100, or both.

Forthcoming Events

REGION 1

Blackpool (B. & F.A.R.S.).—March 22, 7.30 p.m., G4PY, 5 Albion Avenue, Blackpool.
Bury.—April 14, 7.30 p.m., 52 The Drive, Seedfield, Bury.
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., Tarran Hut, Y.M.C.A., Chester.
Crosby.—Tuesdays, 8 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo.
Isle of Man (I.o.M.A.R.S.).—March 16, April 6, 20, Manor Guest House, Victoria Road, Douglas.
Lancaster (L. & D.A.R.S.).—April 6, 7.30 p.m., The George Hotel, Torrisholme.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., St. Barnabas Hall, Penny Lane, Liverpool, 15. **(M.R.S.).**—March 23, April 13, 8 p.m., Larkhill Mansion House, Queens Drive, Liverpool, 13.
Manchester (M. & D.R.S.).—April 4, 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester. **(S.M.R.C.).**—Fridays, 7.45 p.m., Ladybarn House, Mauldeth Road, Manchester, 14.
Preston.—March 25, 7.45 p.m., St. Saviour's Parish Hall, Manchester Road, Preston.
Rochdale (R.R.T.S.).—Fridays, 7.45 p.m., 1 Law Street, Sudden.
Southport.—Thursdays, 8 p.m., Y.M.C.A., off Eastbank Street, Southport.
Stockport (S.R.S.).—March 16, 30, April 13, 8 p.m., The Blossoms Hotel, Buxton Road, Stockport.
Warrington (W. & D.R.S.).—March 17, April 7, 21, 7.30 p.m., The King's Head Hotel, Winwick Street, Warrington.
Wirral (W.A.R.S.).—March 16, April 6, 20, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—March 25, April 15, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—March 22, 7.30 p.m., Cambridge House, 66 Little Horton Lane (A.G.M.).
Catterick.—Wednesdays, 7 p.m., Loos Lines, Catterick Camp.
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.
Doncaster.—April 12, 7.30 p.m., Y.W.C.A., Cleveland Street.
Gateshead.—Mondays, 7.30 p.m., Mechanics Institute, 7 Whitehall Road.
Hull.—March 29, April 12, 7.30 p.m., "Rampant Horse," Paisley Street.
Leeds.—Wednesdays, 7.30 p.m., Swarthmore Educational Centre, 3 Woodhouse Square.
Middlesbrough.—Thursdays, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.
Pontefract.—March 31, April 7, 8 p.m., Fox Inn, Knottingley Road.
Rotherham.—Wednesdays, 7 p.m., Cutlers Arms, Westgate.
Scarborough.—Thursdays, 7.30 p.m., B.R. Rifle Club, West Parade Road.
Sheffield.—March 23, 8 p.m., "Dog and Partridge," Trippet Lane. April 13, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spenborough.—March 23, Visit; April 6, 7.30 p.m., Temperance Hall, Cleckheaton.
York.—Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South).—April 4, 7.30 p.m, Friend's Hall, Watford Road, Cotteridge. **(M.A.R.S.).**—March 21, 7 p.m., Midland Institute. **(Slade).**—March 18, April 1, 15, 7.45 p.m., Church House, High Street, Erdington.
Coventry.—March 25, 7.30 p.m, Priory High School, Wheatley Street. **(C.A.R.S.).**—March 28 ("Radio Aids to Navigation," G3RF). April 7, 7.30 p.m., 9 Queens Road.
Kenilworth, Leamington and Warwick.—March 17, 7.30 p.m., Dalehouse Lane.
Malvern.—April 4, 8 p.m., Foley Arms.
Redditch.—March 22, 8 p.m., Scale and Compasses, Birchfield Road. April 7, 8 p.m., 10 Woodlands Road.
Rugby.—April 7, 7.30 p.m., B.T.H. Recreation Club, Hillmorton Road.
Solihull.—March 21, April 4, 7.30 p.m., Defence H.Q., Sutton Lodge, Blossomfield Road.
Stoke-on-Trent.—March 30, 8 p.m., Lions Head, John Street, Hanley.
Stourbridge.—April 5, 8 p.m., King Edward VI School.
Walsall.—March 23, April 13, 8 p.m., Technical College, Bradford Place.
Wolverhampton.—March 14, 28, April 11, 8 p.m., Stockwell End, Tettenhall.
Wrekin.—Venue and dates from G, Myatt, 10 Swan Street, Broseley.

REGION 4

Alvaston.—Tuesdays, Thursdays, 7.30 p.m, Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, nr. Derby.
Chesterfield.—Tuesdays, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—Wednesdays, 7.30 p.m., Derby College Arts & Crafts, Sub-basement, Green Lane.
Ilkeston (I. & D.A.R.S.).—Thursdays, 7 p.m., Ilkeston College of Further Education.
Leicester (L.R.S.).—March 28, 7.30 p.m., Holly Bush Hotel, Belgrave Gate.
Lincoln (L.S.W.C.).—April 6, 7.30 p.m., Technical College, Cathedral Street.
Mansfield (M. & D.A.R.S.).—No March meeting. April 12, 7.30 p.m., Denmans Head Hotel, Market Place, Sutton-in-Ashfield.
Newark.—April 3, 7 p.m., Northern Hotel, Appleton Gate.
Northampton (N.S.W.C.).—Fridays, 7 p.m., April 1, 6 p.m., Club Room, 8 Duke Street.
Nottingham.—March 18, April 15, 7.30 p.m., Sherwood Community Centre, opposite Woodthorpe Drive, Sherwood.
Peterborough.—April 6, 7.30 p.m., 21 Hankey Street.
Worksop.—April 4, 7 p.m., King Edward Hotel.

REGION 5

Chelmsford.—April 5, 7.30 p.m., Marconi College, Arbour Lane. **(B.A.T.C.).**—April 14, 7.30 p.m., G3CVO, ("Aspects of N.T.S.C. Colour Television.")
Lowestoft and Beccles (L. & B.A.R.C.).—March 30, April 13, 7.30 p.m., Y.M.C.A., Lowestoft.

REGION 6

Cheltenham.—April 7, 8 p.m., Great Western Hotel, Clarence Street.
Gloucester (G.R.C.).—Thursdays, 7.30 p.m., The Cedars, 83 Hucclecote Road, Gloucester.
High Wycombe.—March 22, 7.30 p.m., G3FAS, 51 Tyzack Road, Totteridge.
Jersey, C.I.—March 29, 7.45 p.m., Chamber of Commerce, Royal Square, Jersey.
Oxford (O. & D.R.S.).—March 23, April 13, 7.30 p.m. Club Room, "Magdalen Arms", Iffley Road, Oxford.
Portsmouth.—Tuesdays, 7.30 p.m., British Legion Club, Queens Crescent, Southsea. (Club room open every evening.)
Southampton.—April 2, 7 p.m., 1 Prospect Place.
Stroud.—Wednesdays, 7.30 p.m. Subscription Rooms.

REGION 7

London (L.M.L.C.).—March 18, April 22, 12.30 p.m., Bedford Corner Hotel, Bayley Street, off Tottenham Court Road, W.C.1.
London (R.S.G.B.).—March 25, 6.30 p.m., I.E.E., Savoy Place, Victoria Embankment, W.C.2 ("The Historical Development of Wireless Communication," Maurice Child).
London (U.H.F. Group).—April 7, 7.30 p.m., Bedford Corner Hotel, Bayley Street, off Tottenham Court Road, W.C.1.
Acton, Brentford and Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick, W.4.
Barnes, Putney and Richmond.—April 1, 337 Upper Richmond Road, S.W.14.
Bexleyheath.—March 24, April 14, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Bromley (N.W.K.A.R.S.).—April 8, 8 p.m., Shortlands Hotel, Station Road, Shortlands, Kent.
Chingford.—March 25, April 8, 8 p.m., venue from G4GA (SIL 5635) or B.R.S.19765 (SIL 6055).
Chislehurst and Sidcup.—April 13, "Seven Stars," High Street, Footscray.
Croydon.—April 5, 7.30 p.m., "Blacksmiths Arms," 1 South End, Croydon.
Dorking.—Tuesdays, 7.30 p.m., 5 London Road.
East Ham.—Tuesdays, 8 p.m., 12 Leigh Road.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway, W.5.
East London.—April 17, 2.30 p.m., Town Hall, Ilford.
Enfield.—March 20, 3 p.m., George Spicer School, Southbury Road, Enfield.
Finsbury Park.—March 15, April 19, 7.30 p.m., 16 Albion Road, Stoke Newington, N.16.
Guildford and Woking.—March 27, 3 p.m., Royal Arms Hotel, North Street, Guildford ("Junk Sale").
Hendon and Edgware.—Wednesdays, 8 p.m., 22 Goodwins Avenue, Mill Hill.
Hoddesdon.—April 7, 8 p.m., "Salisbury Arms."
Holloway (G.R.S.).—Mondays and Fridays, 7 p.m., Grafton School, Eburne Road, London, N.7.
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road.
Kingston (K. & D.R.S.).—Alternate Wednesdays, 7.45 p.m., Penrhyn House, Penrhyn Road.
Lewisham (R.A.R.C.).—Wednesdays, 8 p.m., Durham Hill School, Downham.
Norwood.—March 19, April 16, Windermere House, Weston Street, Crystal Palace.
Southgate and Finchley.—April 7, 7.30 p.m., Arnos School, Wilmer Way.
Slough.—April 5, venue from G2HOX or G3BTP, 13 Quaves Road, Slough.
Sutton and Cheam (S. & C.R.S.).—March 15, April 19, "The Harrow," Cheam Village.
Welwyn Garden City.—April 5, 8 p.m., Council Offices, Welwyn Garden City, Herts. ("First Steps on Two," J. Hum, G5UM.)

REGION 8

Brighton (B.D.R.C.).—Tuesdays, 7.30 p.m., Eagle Arms, Gloucester Road.
Chatham (M.A.R.T.S.).—March 28, April 11, 25, 7.30 p.m., Services Rendered Club, 14 High Street, Brompton, Chatham.

(Continued on page 449)

Slow Morse Practice Transmissions

G.M.T.	Call	kc/s	Town
Sundays			
09.00	G3GYV	1900	Whitley, near Warrington
09.30	G3BKE	1900	Newcastle-on-Tyne
10.00	G6MH	1990	Southend-on-Sea
10.30	G3DGN	1920	New Barnet
11.00	G2FXA	1900	Stockton-on-Tees
12.00	G3LP	1850	Cheltenham
12.00	G3JBU	1850	Northampton
12.00	G15UR	1860	Belfast
14.00	G5AM	1900	Witnesham, Ipswich
21.00	G2FIX	1812	Nr. Salisbury
23.30	G13CFI	1900	Coleraine, N.I.
Mondays			
19.00	G3NC	1825	Swindon
19.00	G3JBU	1850	Northampton
19.15	G2FRX	1850	Plymouth
21.00	G3BLN	1900	Bournemouth
21.00	G3FSM	1900	Brentwood
22.15	G2BRH	1900	Ilford
Tuesdays			
18.30	G2FXA	1900	Stockton-on-Tees
18.30	G3JMP	1875	Bristol
20.30	G3GDZ	1905	Kingsbury, N.W.9
21.00	G3EFA	1855	Southport
23.30	G13CFI	1900	Coleraine, N.I.
Wednesdays			
19.00	G3HUB/A	1902	Chelmsford
22.30	G3FBA	1910	Bath
23.30	G13CFI	1900	Coleraine, N.I.
Thursdays			
19.00	G3NC	1825	Swindon
19.15	G2FRX	1850	Plymouth
20.00†	G2CPS / G2CNX / G3GWT	1910	Hull, Yorks.
20.30	G3DGN	1920	New Barnet
20.30	G3JQM	1878	Barwick, Yeovil
22.30	G3ADZ	1940	Southsea
23.00	G3LA	1915	Brentwood
23.30	G13CFI	1900	Coleraine, N.I.
Fridays			
18.00	G3GEN	1900	Gloucester
19.00	G3BLN	1900	Bournemouth
20.00	G3IIH	1900	Wirral
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees

† *Alternately.*

Slow Morse transmissions are organised by Mr. C. H. L. Edwards (G8TL), 28 Morgan Crescent, Theydon Bois, Essex. Members using the service are requested to send listener-reports to the stations concerned.

Forthcoming Events (Contd. from page 448)

REGION 8 (continued)

Hastings (H. & D.R.C.).—March 22, April 5, 19, 7.30 p.m., Saxon Café, Denmark Place.
Isle of Thanet (I.o.T.R.S.).—Fridays, 7.30 p.m., Hilderstone House, Broadstairs.
Maidstone (M.K.A.R.S.).—Tuesdays, 7.30 p.m., Elms School, London Road.
Worthing (W. & D.R.C.).—April 11, Adult Education Centre, Hawley Street.

REGION 9

Bath.—March 21, Venue from G3FBA (Telephone No. 3861).
Bristol.—March 18, April 15, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol.
Exeter.—April 1, 7 p.m., Y.M.C.A., St. David's Hill.
Falmouth.—March 17, April 7, "The Fifteen Balls," Penryn.
North Devon.—April 7, G3BO, Rosebank, Westcombe, Bideford, Devon.
Plymouth.—March 19, April 16, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.
Torquay.—March 19, April 16, 7.30 p.m., Y.M.C.A., Castle Road.
Weston-super-Mare.—April 5, 7.30 p.m., Y.M.C.A.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

Cardiff.—April 11, 7.30 p.m., "The British Volunteer," The Hayes, Cardiff.
Neath and Port Talbot.—April 13, 7.30 p.m., Royal Dock Hotel, Briton Ferry.

REGION 13

Berwick-on-Tweed.—April 12, Waterloo Hotel, High Street, Berwick-on-Tweed.
Dunfermline (D.R.S.).—Thursdays, 7.30 p.m., behind 34 Viewfield Terrace, Dunfermline.
Edinburgh.—March 17, 31, April 14, 7.30 p.m., Chamber of Commerce Rooms, 25 Charlotte Square, Edinburgh.
Hawick.—March 27, Victoria Hotel, Hawick.

REGION 14

Falkirk.—March 25, April 8, 7.30 p.m., The Temperance Café, High Street, Falkirk.
Glasgow.—March 30, 7 p.m., The Christian Institute, 70 Bothwell Street, Glasgow, C.2.

Affiliated Societies

THE following are additions to the list of Affiliated Societies published in the August, 1954, issue of the BULLETIN.

AMATEUR RADIO SOCIETY OF TRINIDAD AND TOBAGO, 3 Coryat Street, Curepe, Trinidad, British West Indies.

COMPTON BASSETT AMATEUR RADIO CLUB (G3HXZ), c/o Sgts' Mess, R.A.F. Station Compton Bassett, near Calne, Wilts.

ILKESTON & DISTRICT AMATEUR RADIO SOCIETY (G3JSZ), c/o J. Eaton, 74 Station Road, Langley Mill, Nottingham.

STUDENTS' UNION RADIO SOCIETY, Northern Polytechnic and National College of Rubber Technology, Holloway, London, N.7.

Regional & Club News

BRISTOL.—At the February meeting, the " G5FS Memorial Challenge Trophy " was presented to Council Member R. G. Lane (G2BYA) who was judged to have given the best lecture by a local member during 1954. There was also a film show arranged by G2BYA. At the meeting on March 18, the speaker will be R. E. Griffin (G5UH) and his subject " G.P.O. Repeaters and Land Lines ". A visit to the G.P.O. Repeater station in Bristol will take place in April.

BRITISH TWO-CALL CLUB.—Lt.-Col. Sir Evan Y. Neapean, Bart., Royal Signals (G5YN), who is now in Germany has been elected President for 1955. The Vice-President is Ken Ellis (G5KW). British radio amateurs who have held calls in two or more countries are invited to apply for membership. *Hon. Secretary:* G. V. Haylock, A.M.Inst.E. (G2DHV), 63 Lewisham Hill, London, S.E.13.

CHELMSFORD AMATEUR TELEVISION CLUB.—Recent meetings have included an illustrated lecture on " Colour Television " at which there was an attendance of 55, and two lectures on " Seventy Centimetre Television Converters ", by A. Sale, during which reception of signals from G2WJ/T was demonstrated. *Hon. Secretary:* M. Barlow (G3CVO), 10 Baddow Place Avenue, Great Baddow, Essex.

CHELTENHAM.—At the A.G.M. on February 3, excellent progress was reported despite a slight fall in membership. The Annual Three Towns Dinner (Cheltenham, Gloucester and Stroud) has been postponed until later in the year. Subjects for forthcoming lectures include " Single Sideband " and " Transistors ".

GRAVESEND AMATEUR RADIO SOCIETY. — At the recent A.G.M., held in the new club room at the Terrace Hotel, the following were elected to the Committee: *President:* E. J. Parker (G3EJK); *Chairman:* J. Irlam (G3JBT); *Hon. Treasurer:* P. F. Jobson (G3HLF); *Hon. Secretary:* R. E. Appleton, 23 Laurel Avenue, Gravesend; *Committee Members:* V. H. S. Curling (G6VC), F. B. Allen (G3JVU) and R. D. Hill. Meetings are held on Thursdays and prospective members, including newcomers, are always welcome. On March 17, G6BQ will talk on the grid dip oscillator; on March 24 there will be an Auction Sale.

ILKESTON & DISTRICT AMATEUR RADIO SOCIETY.—This Society, which was founded in April, 1954, meets on Thursdays in Room 5, College of Further Education, Field Road, Ilkeston, by courtesy of the Governors. The building, a new one, is well equipped with test gear, laboratory facilities, film projector and canteen. The future programme includes Morse classes, lectures on sound reproduction, constructional work and visits to places of interest. The club station (G3JSZ) is active. Prospective members are invited to contact the *Hon. Secretary:* J. Eaton (G3EZZ), 74A Station Road, Langley Mill, Nottingham.

MEDWAY AMATEUR RECEIVING & TRANSMITTING SOCIETY.—At the recent A.G.M., Lt.-Cdr. (E) R. H. N. Johnston (G2ZP), was elected Hon. Treasurer in place of C. J. Baker (G3HQS), who has resigned for business reasons. All the other officers were re-elected. *Hon. Secretary:* D. H. Brett, 14 Connaught Road, Chatham, Kent.

RAVENSBOURNE AMATEUR RADIO CLUB.—Meetings are held at Durham Hill School, Downham, on Wednesdays from 8-10 p.m. The club station (G3HEV) is active on Top Band. *Hon. Secretary:* J. H. Wilshaw (B.R.S. 18936), 4 Station Road, Bromley, Kent.

READING RADIO SOCIETY.—The Society's Annual Dinner was held at the White Hart Hotel, on March 11, and the A.G.M. on the following day. At the meeting, on March 26, at the Abbey Gateway, there will be a lecture on " Radio Interference ", by a representative of the G.P.O. *Hon. Secretary:* L. A. Hensford (G2BHS), 30 Boston Avenue, Reading.

Southampton Group's Fourth Annual Dinner was held at the Court Royal Hotel, Southampton, on January 21. From left to right (standing), G2FGD, G3GNY, G3GOY, G3ECV, G3BHS, G2DSW, and G5LR; (seated) Mrs. G2FGD, YL G3GNY, Mrs. G3GOY, Mrs. G3BHS and Mrs. G5LR.

ROMFORD & DISTRICT RADIO SOCIETY.—The following were elected at the A.G.M.: *Chairman:* F. Simmons (G2FWJ); *Hon. Treasurer:* E. Boxer (G3AUG); *Hon. Secretary:* N. Miller, 55 Kingston Road, Romford; *Committee Members:* G. Creevy, J. C. Perry (G3EBF) and R. F. Stevens (G2BVN).

SCARBOROUGH AMATEUR RADIO SOCIETY.—J. H. Jones (G3GBH) has been elected *Chairman* for 1955. The club station (G4BP) has taken part in a number of recent contests. Monthly lectures on basic radio are being given by G5VO and G2YS. *Hon. Secretary:* P. B. Briscombe (G8KU), 31 St. Johns Avenue, Scarborough.

SOUTHEND & DISTRICT RADIO SOCIETY.—Recent activities have included a visit to the Barking Power Station—the largest steam generating station in Europe. " Frequency Modulation " was the subject of a lecture by H. Wilkinson, holder of the " Pocock Cup " for the " best workmanship in home constructed gear." *Hon. Secretary:* J. H. Barrance, M.B.E. (G3BUJ), 49 Swanage Road, Southend-on-Sea.

SOUTHAMPTON.—About twenty members and their ladies attended the Group's Fourth Annual Dinner and Social, at the Court Royal Hotel, on January 21. An excellent meal was followed by a lively programme of games and dancing, with G2FGD as the Master of Ceremonies.

SOUTH MANCHESTER RADIO CLUB.—Classes for the Radio Amateurs' Examination are held on Monday evenings at Ladybarn House, Mauldeth Road, Fallowfield. There will be a Junk Sale at the meeting on March 25. On March 11, Harry Whalley (G2HW) was due to lecture on " Tank Circuits ". *Hon. Secretary:* M. Barnsley (G3HZM), 17 Score Street, Bradford, Manchester, 11.

TORBAY AMATEUR RADIO SOCIETY. — George Western (B.R.S.20605), who is blind, has been elected an Honorary Member. He is being coached in technical subjects by B. Symons (B.R.S.19991). Both are learning Morse. At the February meeting, John Hawke (G3FUT) gave an interesting talk on " Audio Amplifiers ". Arrangements for N.F.D. will be discussed by local members of the R.S.G.B. at the meeting on March 19. The A.G.M. is arranged for April 16. *Hon Secretary:* L. H. Webber (G3GDW), 43 Lime Tree Walk, Newton Abbot.

Representation

THE following are additions to the list of Town Representatives published in the December, 1953, issue.

Region 3—Staffordshire
West Bromwich and Handsworth
W. G. Johnson (G2BJY), 22 Lyndon Road, West Bromwich.
Warwickshire
Solihull and District
W. S. Carter (G5QI), The Ards, Dorridge Road, Dorridge.

Region 7—London South
Mitcham
M. A. Pyle (G2BLA), 45 Holne Chase, Morden.

Vacancies
Messrs. R. C. Parnaby, G2DPA (Hull), J. S. K. Stephens, G8WC (Portsmouth) and S. E. Fryer, G3ERO (Hendon, Mill Hill and Edgware) have resigned as town representatives. Nominations for their successors should be made in the prescribed form and sent to reach the General Secretary by not later than April 30, 1955.

Can You Help ?

● C. Taylor (B.R.S.11567), c/o W. E. Bassett & Associates, 522 Little Collins Street, Melbourne, C.1, Australia, who requires the circuit diagram of the Transmitter-receiver Unit type 2 (part of the TR.1148-A equipment) ?

● D. C. Terry (B.R.S.20460), 32 Ardoch Road, Catford, London, S.E.6, who requires the circuit diagram and any other information for the German Wehrmacht Transmitter 30.W.SA which covers 1.12 to 3 Mc/s in three bands ?

● H. H. Thompson (G2FXK), 82 Walsall Road, Aldridge, Staffs., who wishes to buy or borrow the instruction booklet and/or circuit diagram for the Webster Electronic Memory Wire Recorder and the American Transmitter-receiver type TR-19-ARC (142 Mc/s crystal controlled) ?

● R. Woodham (B.R.S.20207), 13 Martin Road, Copnor, Portsmouth, who requires information on the Ohm Meter Series 834-S manufactured by the Precision Apparatus Co., of Elmhurst, New York ?

● The Technical Editor (I1BEY), of *Radio Rivista*, journal of the Italian National Society, who requires technical details of the Wireless Set No. 21 (ZA1829). Information may be sent *via* J. W. Swinnerton (G2YS), 29 Station Avenue, Filey, Yorks.

● W. E. Lee (B.R.S.20349), 1 Spratton Villas, Wellington Street, Matlock, Derbyshire, requires information on the addition of an S meter, bandpread and noise limiter to the R.1155. He also requires details of a suitable converter for Top Band.

● G. W. Moore (VS6CJ), c/o Wireless Dept., Butterfield & Swire, 1 Connaught Road Central, Hong Kong, who wishes to buy a copy of the technical manual for the U.S. Receiver type BC1147A?

● G. H. Harrison (ZC5SF), St. Gummarusstraat 37, Antwerp, Belgium, who requires details of the ex-R.A.F. transmitter-receiver type TR3546 ?

Letters to the Editor

The 420 Mc/s Tests

DEAR SIR,—I note that the Contests Diary for 1955 omits any reference to a 420 Mc/s TEST. Instead, there are two CONTESTS. I wish to protest against this in the strongest possible terms. Any contest on the 420 Mc/s band, under average or worse conditions must favour the London stations, due to the relatively high activity there. Under good conditions, the high power, well-sited stations have the advantage.

Within the next year or so, a number of 150 watt stations, operating from excellent sites will be active in the London area and it is therefore only a matter of time before we see a "battle of the giants" on 420 Mc/s, with the others just "also rans."

More important than the foregoing, however, is the ill-feeling caused by the fact that the CONTEST is not fair to all. If one hopes to make a high score with modest equipment, from a poor location (which is the situation in which the average amateur finds himself) then the only choice open is either to go portable or else operate from an alternative address at a good site. If these facilities are not available, then as a potential winner, one is automatically eliminated!

I do not think that to organize events on such lines has anything to commend it. Reference to the results of the last 420 Mc/s Contest shows that 75 per cent of those active on the band, did not feel it was worth while entering, WHY? Yet, despite this, the Contests Committee has the audacity to state in the December BULLETIN that "the majority of the workers on the band consider that the time has now come when a point-scoring Contest can be run successfully on 420 Mc/s."

The 1954 420 Mc/s Tests proved most disappointing and I submit that this was due to the "Contests Complex" which is written into the rules. For example, in the July BULLETIN we read:—"Rule 2—Any mode of transmission may be used, provided that the entrant adheres to the terms of his licence." May I enquire what "mode of transmission" the B.R.S. man uses? Why was a 420 Mc/s test log entry, submitted by a B.R.S. member sent back to him, with an insulting letter and why did not the Contests Committee mention this in the report, published in the December BULLETIN?

Why, as we are supposed to do tests, are we restricted to only one contact with any specific station on each week-end? In view of the fact that it is a TEST, why is it necessary to demand a list of stations worked, with the distances?

It would be interesting to know what genius thought up Rule 6, which effectively eliminates those who have worked as a team on this band!

Surely, the whole purpose of a 420 Mc/s Test should be to encourage the circulation of ideas and new techniques amongst those interested in the development of the u.h.f. bands. We need to encourage and help the newcomer as well as the ardent stalwarts.

The recent R.S.G.B. Exhibition showed that there is no shortage of new ideas, techniques or equipment. The Contests Committee, however, seems to want to suppress the 420 Mc/s Tests and substitute a Contest.

It is significant that the Chairman of the Committee once stated that the 420 Mc/s Tests had "always been a headache for them." Apparently it is now just too much trouble. If they are not prepared to organize a 420 Mc/s Test, then why cannot the event be handed over to a sub-committee or even a new committee or must I assume that the entire resources of the Society cannot succeed in organizing such a Test?

Yours faithfully,

Dulwich, London, S.E.22. C. E. NEWTON (G2FKZ).

DEAR SIR,—I have every respect for Mr. Newton (G2FKZ), having worked with him on a number of projects over the years, and it is to give him and others further information to enable them to assess better Council's decision on contests, and 420 Mc/s events in particular, that I am replying to his letter.

To G2ADZ I have previously stated (February, 1955, issue) that, generally, contests have factors over which there is no control, except the D/F event which falls in a class where competitors' equipment equality is better than any: other contests are less ideal in this respect, and location, in varying degree.

If one must have equality before a contest be arranged, then there can be no contests where members choose their own equipment, power and location. Contests serve to produce activity at stated times and places and give fun in participation as a primary function, but they cannot be fair to all.

There appears to be a misconception in the minds of some members as to the authority of the Contests Committee. It is true that the Contests Committee in common with other Committees set up by the Council have the power to deal with matters of detail, but when it comes to questions of policy they, like all other Committees, are required to bring such questions to the notice of the Council in the form of recommendations. It is the Council that has to decide whether or not to accept the recommendations.

In the case of the Contests Committee, the Technical Committee and R.A.E.N. Committee, the Council wisely invites a certain number of non-Council members to serve as co-opted members. Such members are experts in their particular field and as experience is gained the service which they can give to the Society becomes more and more valuable.

Council serves the members; if evidence collects on the table before the Contests Committee that a contest is popular, it remains; if inequality of a controllable nature appears, adjustment of the rules must be made; if a contest is neglected it must be abandoned, hence the changing picture of "Contests Diary."

Several years ago 420 Mc/s needed to be developed and activity encouraged but experience and equipment did not exist; therefore the conception of a Test was developed. The Tests were excellent and produced the needed results. In recent years requests began to arrive calling for Contests, so in 1954, both types of event were organized.

The evidence on the table during 1954 showed that interest no longer existed in sufficient quantity to warrant the necessary printing, judging and award for 420 Mc/s Tests, and that 420 Mc/s Contests had become the primary interest.

420 Mc/s Tests: 4 members interested, 3 entrants.

420 Mc/s Contests : 40 members interested, 10 entrants.

No purely receiving contest has ever been really successful.

The remark attributed to me has been quoted out of context and will be better understood with these comments.

For the Tests, members submitted evidence of work done—equipment, circuits, results, etc.—anything to prove their worth, and many excellent entries were received, some voluminous enough to fill a BULLETIN on their own. These sheaves of paper and details had to be studied separately, firstly by individual members and finally by the Committee as a whole. There were many facts to consider, unusual ones, and the degree of excellence varied from contestant to contestant; each in his own particular field of enquiry. It was extremely difficult to be sure that the judging was fair and that the really outstanding member had been found for the award—so different from the point-scoring contest where, largely, the contestant judges himself. Would all this be fairly covered by the expression "always been a headache to them," meaning the Contests Committee?

Rule 6 was not thought up by a genius, it was agreed by the whole Committee! It certainly must have had a touch of genius for, from results, it appears that there would have been but one team, one contestant, one award.

And finally, the insulted B.R.S. member. The particular 420 Mc/s Test entry contained conditions never previously laid down by any member as to copyright and a demand including that the entry be returned to the sender "complete, intact and not marked or defaced in any way whatsoever." What might this involve—legal proceedings? damages? Would judgment, comment or quotation be considered libel? It was decided that the entry could not be accepted on the competitor's conditions and was therefore rejected as an entry and carefully returned. Who was insulted?

Yours faithfully,

W. H. MATTHEWS (G2CD).

Seven Kings, Essex. Chairman, Contests Committee.

A Compact 75 Watt Table Top Transmitter for 14, 21 and 28 Mc/s

DEAR SIR,—I have read with interest and appreciation the article by George Jessop (G6JP) published in the January, 1955, issue of the BULLETIN. However, there are several points which I feel should be clarified.

(1) In the opening paragraph, the filter used with the transmitter should, of course, be a *low*-pass type.

(2) In Fig. 1, the switch section S2b indicates *increasing* frequency with anti-clockwise rotation whereas sections S2a and S2c both indicate *decreasing* frequency. This might lead to some confusion. The connections to the top and bottom contacts on S2b should, of course, be reversed.

(3) The provision for v.f.o. input is very unorthodox! The author does not indicate what kind of v.f.o. output circuit should be employed to feed into the high capacitative input to V1, caused by the retention of C1 and C2 in the v.f.o. position of S1. It would appear desirable to employ another wafer on S1 which could be used to disconnect C1 and short-circuit C2 and RFC1 in the v.f.o. position.

(4) Still referring to Fig. 1 of the article, XL should, I suggest, be wired between the upper end of RFC2 and the control grid of V5 as is normal practice for such anti-parasitic devices.

(5) The speech would surely sound "woolly" after encountering C30 and C31 in Fig. 1 since both these condensers are given as 0.01 μF. Together with C12 in Fig. 2, this means the modulation transformer is effectively loaded with a capacity of 0.025 μF which represents a reactance of only 6,000 ohms at 1000 c/s. I suggest that C30 should be 0.001 μF while C31 need only be 100 or 200 $\mu\mu$F for effective harmonic by-passing. (Incidentally, RFC4 should be a v.h.f. choke, not an ordinary choke as indicated, since its function is to prevent harmonics of 14, 21 and 28 Mc/s getting into the 550 volts h.t. line.) By the same reasoning, C10 and C11 (Fig. 2) should not be 0.01 μF or the modulation transformer primary will be heavily damped: 0.001 μF at the most should be used in this position. The author refers to T2 as a "modulation transformer (Collins or similar)." It would be helpful to indicate the type and necessary connections or at least to give the anode-to-anode impedance figure for V4 and V5 as well as the modulating impedance for the p.a. (4,400 ohms).

(6) The mounting of the clamper valve (V6, Fig. 1) inside the p.a. screening box is generally considered to be bad practice, because the valve will be in an intense r.f. field and may pick up (by capacity coupling) sufficient r.f. voltage to cause a tendency for unwanted feedback on the control grid circuit of V5. However, since V6 is virtually earthed *via* C25 it is possible that this is sufficient protection against such an effect.

(7) At the author's figure of 160 volts for the working screen voltage on V5, the *total* screen current flowing through R28 must be 8.3 mA. This seems rather low with a control grid current (total) of about 7 mA average to an 829B. The valve manufacturers' figures suggest a screen resistor of only 13,300 ohms at 600 volts h.t. with a total screen current of 30 mA for a total grid current of 12 mA, the recommended screen voltage being 200. Something rather nearer these figures would seem desirable: say, at 550 volts h.t. and a total control grid current of 7 mA, a total screen current of 20 mA at 200 volts, R28 should therefore be 17,500 ohms. As it is, according to the author's figures, and allowing a total of 7 mA for control grid current and 8.3 mA for screen current, both included in the figure of 125 mA measured in the cathode of V5, the true anode input to V5 is only 60 watts and not 75 watts as stated.

(8) In Fig. 1, the live 6.3 volt heater line is shown connected to the 300 volts positive input terminal.

(9) The value (1 Megohm) for R12 in Fig. 2 seems very high for use with such a relatively low impedance valve as a B65. Should this be reduced?

(10) The grid bias rectifier V7 (D77) in Fig. 2 is heated from the earthed 6.3 volt heater supply. There will thus be 230 volts a.c. between its heater and cathodes when using the bias voltage supply transformer shown. Is this safe?

May I say that the idea of putting RFC3 on the low r.f. potential side of L (the p.a. tank coil) is very sound, but I think that its value ought not to be identical to that of RFC2 in the p.a. grid circuit for fear of l.f. parasitic oscillation.

I trust Mr. Jessop will accept my remarks as constructive criticism of his article.

In conclusion, I should like to draw attention to the advisability of connecting yet another choke across C28. Should the blocking condenser, C27, break down, the h.t. or power supply fuse would then blow because of the d.c. path to earth thus offered. This would prevent the possibility of a dangerous h.t. voltage appearing on the aerial circuit. I must confess that I have not shown such a choke in my own articles and I take this opportunity of urging its inclusion.

Yours faithfully,
LOUIS VARNEY, A.M.I.E.E. (G5RV).

Chelmsford, Essex.

DEAR SIR,—I thank you for giving me an opportunity to reply to the letter from Mr. Varney. My comments are as follows.

(1) A low, not high, pass filter is, of course, used.

(2) The circuit diagram is quite conventional and the fact that the switch S2b appears to operate in the opposite direction to S2a and S2c is not incorrect for such a diagram. It would be wrong if Fig. 1 were a wiring diagram. The more recent service data sheets covering receivers, etc., do, in fact, show switch wafer diagrams to overcome this type of query.

(3) The v.f.o. used during testing was a Wilcox-Gay and its rather large output was not troubled by the relatively high input capacity to V1. I agree that the addition of another wafer on S1 to disconnect C1 and short circuit C2 and RFC1 in the v.f.o. position would be an improvement.

(4) The anti-parasitic choke XL in the grid of the p.a. valve should, of course, be as close to the actual valve connections as possible and be connected between the junction of C20 and RFC2 and the valve grid; not as shown in Fig. 1, 8 and 9.

(5) The value of C30 is given incorrectly and should be 0.001 μF, not 0.01 μF. In the case of C31, an 0.01 μF was in fact used, and while I agree with the suggestion that it need only be 100 or 200 $\mu\mu$F, nevertheless the comparative tests were made with an 0.01 μF condenser. Those tests were made against an earlier transmitter where no speech frequency restriction had been introduced and the reports were complimentary. It should be remembered that with a crystal microphone and appreciable bass frequency cutting, "woolliness" would be considerably reduced. The frequency response (Fig. 4) of the speech amplifier was taken with C10, C11 and C12 in position.

Regarding the modulation transformer, a Woden type UM1 would be a suitable component.

(6) The clamper valve is fitted with a screening can and ideally should be mounted outside the p.a. screening box. However, no feedback was encountered with the arrangement shown.

(7) The cathode current for the p.a. stage should have been quoted as 135 mA, not 125 mA, and the value of R28 as 22,000 ohms, not 47,000 ohms. The 47,000 ohms resistor was used originally when the rating of the transmitter was 50 watts, as was the 160 volts. The final value of 22,000 ohms for R28 was specified as a compromise for use with either 829B or 5B/254M valves in the p.a. stage.

(8) This is an obvious error.

(9) The values of R12 and R13 were unfortunately transposed in the caption to Fig. 2.

(10) The heater/cathode voltage of the D77 is below 230 volts a.c. and is satisfactory. The valve is commonly used in a series chain across 250 volts maximum a.c. in television receivers.

Yours faithfully,
GEORGE JESSOP, A.M.Brit.I.R.E., Assoc.I.E.E. (G6JP).

Eastcote, Pinner, Middlesex.

More About Lundy

DEAR SIR,—As possibly the only amateur to have operated from Lundy, I would like to add a little to Mr. Anthony Cockle's letter in the February issue of the BULLETIN.

The "commando" style landing which he visualised, is somewhat similar to that which I experienced on my first visit to the island some years ago. The radio link to Hartland Point had broken down on the transmitter side and no communication had been possible for three days —a serious state of affairs in an emergency.

Someone thought of Amateur Radio and I was asked if I would go over to Lundy by air. Because there are no facilities for night flying I had only one hour in which to locate the fault—a fairly easy one—and get the transmitter on the air again. Since then I have spent several holidays on the island looking over the gear during my visits.

Originally, the equipment was situated at the old lighthouse, which meant a walk of half a mile for the agent every time there was any traffic—no mean job for a man approaching his seventies, as those who have seen Lundy in its wild moments will know. For that reason, two years ago I moved the station to the hotel where it is now installed above the bar in the Marisco Tavern.

I will see what can be done about portable operation from there—perhaps this coming summer.

Yours faithfully,
JACK CALDWELL (G8US)

Bideford, Devon.

DEAR SIR,—I found G3IEE's letter in the February issue of the BULLETIN especially interesting as I believe I am the only amateur to have held portable permits for Lundy. (It is incorrect to call it Lundy Island.) I worked there in 1951 and 1952.

The legal position of the island is straightforward, and the "pocket kingdom" conception is a myth fostered by the late owner and the Press.

The island cannot claim any independence from the United Kingdom in law; moreover, it is part of England, its residents voting in English elections, and taking part in the English census; and at one time using English ration cards.

One curious anomaly does exist. The radio-telephone equipment used on the island is privately owned, is not licenced, and handles third-party traffic for gain. It is the only installation of this kind which I know of in England.

The authorities did not grant me a separate prefix for operation from Lundy, and I doubt whether they would have done if pressed.

Lundy is, however, the ideal location for v.h.f. equipment. There is available a 90 foot disused lighthouse tower, whose base is over 500 feet above sea-level. It might be possible to transmit on centimetric wavelengths from here to Southern Ireland or the mountains of Wales. But it is unlikely that a licenced GL station will soon be heard on the air.

Yours faithfully,
Acomb, York. J. H. O. PARKER, LL.B. (G3FFL).

British North Greenland Expedition

DEAR SIR,—Reading the account of radio activity in the B.N.G.E. which you published last month, prompts me to express my thanks, on behalf of us all, for the help of the R.S.G.B. Not one of us is a member and yet the BULLETIN was sent to relieve our tedium and, above all, our QSL cards were expeditously dealt with. One result of all this is that the activities of amateurs have been brought to the notice of many people who, previously, were entirely ignorant of their existence. On many occasions whilst we were in Greenland, amateurs succeeded in providing communication when non-amateur operators had failed, thus proving that Amateur Radio is more than just a hobby.

Yours faithfully,
R. BRETT-KNOWLES (Lt.-Cdr., R.N.),
Signals Officer, B.N.G.E.

Mobile Operation

DEAR SIR,—With the increasing interest in mobile operating I feel that attention ought to be drawn to the legal position should the operator/driver be involved in an accident. If it were established that the driver was using a microphone or operating controls at the time of the accident it would surely invite a charge of driving "without due care and attention," if not a more serious one.

Perhaps a member in the legal profession would like to comment on this aspect of mobile working?

Yours faithfully,
London, W.1. J. C. ALDRED (G8UQ).

LONDON LECTURE MEETING

March 25, 1955: Mr. Maurice Child.

"THE HISTORICAL DEVELOPMENT OF WIRELESS COMMUNICATION"

(with demonstration of early apparatus).

The meeting will be held at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2. Buffet Tea from 5.30 p.m. Meeting commences at 6.30 p.m.

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Corporate Members, Home (Licensed)

G3HK †R. NEWSHAM, 45 Crosby Street, Maryport, Cumberland.
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G3JOL V. W. COLE, Saracens Head Hotel, Daventry, Northants.
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G3KBK †T. G. MUSGROVE, Millbank Farm, Bedlington, Northumberland.
G3KCI W. CRAVEN, 20 Collingwood Road, Great Yarmouth, Norfolk.
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G3KEA R. W. APPLETON, 10 Serjeant Street, Peterborough, Northants.
G3KEF *T. J. FISHPOOL, 258 Brownshill Green Road, Coventry, Warwicks.
G3KEG C. C. ROGERS, 100 Sparth Road, Clayton-le-Moors, Accrington, Lancs.
G3KEP *D. M. PRATT, 27 Woodlands Grove, Cottingley, Bingley, Yorks.
G8QQ †E. P. JONES, 11 Northcote Road, Mangotsfield, nr. Bristol, Gloucestershire.
GI3HXV R. R. PARSONS, 134 Benmore Drive, Finaghy, Belfast, N. Ireland.
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20527 *A. G. GARDNER, 46 Marlborough Road, Bearwood, Smethwick, 41, Staffs.
20528 *A. G. FURZE, "Catherine," River View Road, Vange, Essex.
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20544 *D. W. BENJAMIN, Glyn Rheidol, Cwmrheidol, Capel Bangor, Aberystwyth, Cards.
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20547 *R. J. L. PRATT, 15 Hellards Road, Stevenage, Herts.
20548 *J. McLEOD, Rosedene, Tytler Street, Forres, Morayshire.
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20550 *H. F. BARKER, 2 Shinfield Rise, Reading, Berks.
20551 *G. SLAUGHTER, 6 Leggatts Wood Avenue, Watford, Herts.
20552 W. J. BLANCHARD, Coronation Road, Ulceby, Lincs.
20553 7592680, W.O.II W. J. NORTHCOTT, R.A.O.C., 6 Franshawe Road, Chadwell St. Mary, Essex.
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20555 W. H. NICHOLS, Byways, Brampton, Huntingdon.
20556 4099227, CPL. R. C. MALONE, 194 Squadron, R.A.F., Felixstowe, Suffolk.
20557 E. H. MATHEWS, 7 Tyrrell Road, South Benfleet, Essex.
20558 A. J. A. WALDREN, 107 Bath Road, Hounslow, Middlesex.
20559 A. D. GOOD, 28 Eastbourne Grove, Heaton, Bolton, Lancs.
20560 F. C. CHARLTON, 25 Chatburn Road, Chorlton-cum-Hardy, Manchester, 21.
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20562 O. GITTINS, Diplomatic Wireless Service, c/o Foreign Office, London, S.W.1.
20563 *H. J. HOPKINS, 42 Westward Rise, Barry, Glam.
20564 J. A. L. JORDAN, 22a Thistle Street, Edinburgh, 2.
20565 *P. J. FOX, Minions, Liskeard, Cornwall.
20566 *D. A. HOWES, 252 Gower Road, Sketty, Swansea, Glam.
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20572 *C. BRAY, 9 Marine Terrace, Liverpool, 22.
20573 *J. W. TRANMER, 4 Stapleford Avenue, Newbury Park, Ilford, Essex.
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20575 *A. Y. WILES, 157 Bollo Lane, Acton, London, W.3.
20576 *T. J. BENNETT, Southfield, Owlsmoor, nr. Camberley, Surrey.
20577 *K. WOORALL, "Rydal," Whitehouse Road, Eastwood, Leigh-on-Sea, Essex.
20578 *R. GRAH, 76 Ashland Road, Sheffield, 7, Yorks.
20579 *V. M. RIX, 4 Inglesham Road, Penhill, Swindon, Wilts.
20580 *B. DARBY, 17 West Street, Blackheath, Birmingham.
20581 *R. F. HILLS, 27 Elms Road, Harrow Weald, Middlesex.
20582 *E. U. E. F. GREEN, 67 Forest Road, Barkingside, Ilford, Essex.
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20584 *A. J. BROCK, 98 Dora Road, Wimbledon, S.W.19.
20585 *J. H. B. WHITE, 12 Highfield Road, Timperley, Cheshire.
20586 *G. E. LANE, 2 School Lane, Horbury, Yorks.
20587 *A. JARVIS, 516 Kingsbury Road, Erdington, Birmingham, 24.
20588 *V. H. SLANEY, 32 Highland Grove, Worksop, Notts.
20589 *H. FRENCH, 18 Beeches Road, West Bromwich, Staffs.
20590 *V. OLIVA, 12 Hartham Road, Holloway, London, N.7.
20591 *F. W. MAJER, 87 Strone Road, Forest Gate, London, E.7.
20592 *R. V. CORNELIUS, 47 Harborough Road, Polygon, Southampton, Hants.
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20595 *E. J. H. ROGERS, 31 Lynton Avenue, Tettenhall, Wolverhampton, Staffs.
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20601 *C. P. HOWARD, 124 Rose Lane, Liverpool, 18.
20602 E. J. FALLON, 8 Queens Road, Lipson, Plymouth, Devon.
20603 W. H. MARTIN, 70 Twyford Road, Eastleigh, Hants.
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20611 J. CRADDY, Newlands, Lead Lane, Ripon, Yorks.
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20614 P. JACKSON, 119 East Common Lane, Scunthorpe, Lincs.
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20618 A. E. BARKER, 140 Burnway, Hornchurch, Essex.
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J. W. RAYSON, 29 Roseville Street, St. Helier, Jersey, C.I.
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*Denotes transfer from Associate Grade. †Denotes re-elected.

Radio Amateur Emergency Network

THE following is a list of E.C.O.s whose appointments for 1955 have been approved by the R.A.E.N Committee. Additions and deletions to this list will appear in the regular R.A.E.N. news feature from time to time.

REGION 1

Bebbington.—L. N. Goldsbrough (G3ERB), 54 Kings Lane, Bebbington, Cheshire.
Blackpool.—W. S. Horsfall (G3GXX), District Bank Chambers, Blackpool.
Southport.—T. F. Wareing (G3EFA), 105 Shellfield Road, Southport.

REGION 2

Barnsley & District.—W. D. Heath (G3ABS), 4 Dalton Terrace, Derby Dale, Huddersfield.
Beverley.—F. Marshall (G2CPS), 92 Flemingate, Beverley, Yorks.
Flamborough.—W. R. Metcalfe (G3DQ), Carr Farm, Flamborough, Yorks.
***Hornsea.**—Lt. Col. A. C. Dunn (G2ACD), 142 Newbegin, Hornsea, Yorks.
Hull.—R. Burwell (G4LH), 46 Grafton Street, Hull, Yorks.
Leven.—H. M. Rix (G5GX), "Greenroof," Leven, nr. Hull, Yorks.
Middlesbrough.—T. Griffin (G3GUV), 10 Balder Street, Middlesbrough.
Sheffield.—J. R. Petty (G4JW), 580 Redmires Road, Sheffield, 10.

REGION 3

Lichfield (South Staffs.).—E. A. Mathews (G3FZW), 1 Shortbutts Lane, Lichfield, Staffs.
Stoke-on-Trent.—V. J. Reynolds (G3COY), 90 Princes Road, Hartshill, Stoke-on-Trent.

REGION 4

Grimsby.—F. R. Petersen (G3ELZ), 58 Peaksfield Avenue, Grimsby, Lincs.
Peterborough.—L. Critchley (G3EEL), 36 Waterloo Road, Peterborough.
Retford.—M. White (G3BTU), 39 Trent Street, Retford, Notts.
South Wigston.—M. Kind (G3GXZ), 62 Clifford Street, South Wigston, Leics.

REGION 5

Acle.—H. Hunt (G3HRW), 2 Station Road, Acle, Norwich, Norfolk.
Chelmsford.—R. Ferguson (G4VF), 33 St. Fabian's Drive, Chelmsford, Essex.
Clacton-on-Sea.—W. J. Mason (G3HSM), 39 Victory Road, Clacton-on-Sea.
Felixstowe.—R. A. Wilson (G4RW), "The Hollows", Newry Avenue, Felixstowe, Suffolk.
Holt.—D. F. Willies (G3HRK), "The Wilderness", Grove Road, Holt, Norfolk.
Lowestoft.—Dr. A. C. Gee (G2UK), "East Keal", Romany Road, Oulton Broad, Lowestoft, Norfolk.
Norwich.—H. Staff (G4KO), 59 Charles Avenue, Thunder Lane, Thorpe, Norwich.
Royston.—A. R. Mee (G3ERV), 20 Greendrift, Royston, Herts.

REGION 6

Cheltenham.—J. J. Yeend (G3CGD), 30 St. Lukes Road, Cheltenham, Glos.
Oxford.—E. B. Grist (G3GJX), 51 Home Close, Wootton, Abingdon, Berks.
Portsmouth.—L. Rooms (G8BU), 51 Locksway Road, Milton, Portsmouth, Hants.
Southampton.—R. Gardner (G3CGE), 62 Rosewall Road, Maybush, Southampton.
Witney.—J. E. Swayne (G3BLE), 12 Oxford Hill, Witney, Oxon.
Wolverton.—F. H. Dewick (G3HIU), 47 Gloucester Road, Wolverton, Bucks.

REGION 7

Godalming.—R. Betton-Foster (G3DBB), "Windy Ridge", Bushbridge Lane, Godalming, Surrey.
Ilford.—S. Sawyer (G3IPL), 166 Stadbroke Grove, Ilford, Essex.
Romford.—S. Poole (G3IMP), 26 Cross Road, Romford, Essex.
Sidcup.—A. Swindon (G3ANK), 135 Station Road, Sidcup, Kent.
Sydenham.—E. Rayner (G6IO), 44 Lawrie Park Gardens, Sydenham, London, S.E.26.

REGION 8

Broadstairs (Isle of Thanet).—G. A. Partridge (G3CED), 11 Ethel Road, Broadstairs, Kent.
Steyning.—B. C. O. Oddy (G3FEX), "Bonigen", Maudlyn Close, Steyning, Sussex.
Whitstable.—M. D. Homes (G3JMC), 53 Clare Road, Tankerton, Kent.

REGION 9

Bristol.—S. T. Crowther (G3JMP), 91 Passage Road, Westbury-on-Trym, Bristol.
Dorchester.—C. Biggs (G2TZ), Winterbourne Abbas, Dorchester, Dorset.
Stratton-on-the-Fosse.—G. W. Tonkin (G5RQ), "Ingsdon", Downside, Stratton-on-the-Fosse, nr. Bath, Somerset.
Torquay.—F. J. Wadman (G2GK), 106 Warbro Road, Babbacombe, Torquay, Devon.
Weston-super-Mare.—W. C. Holley (G5TN), "Waverley," Worlibury Hill, Weston-super-Mare.

REGION 10

Aberdare.—C. R. Mountjoy, M.M. (GW3ASW), "Pant Villa", Cwmbach, Aberdare, Glamorgan.
Pembroke Dock.—G. Courtenay-Price (GW2OP), Bangeston Hall, Pembroke Dock.

REGION 11

Aberystwyth.—V. C. Morgan (GW3FRK), "Hafan", Comins Coch, Aberystwyth.

REGION 13

Berwick-on-Tweed.—T. Kennedy (G6UC), 22/4 Main Street, Spittal, Berwick-on-Tweed.

REGION 14

Larbert.—O. M. Derrick (GM3OM), 261 Main Street, Larbert, Stirlingshire.

REGION 15

Armoy.—G. Henry (GI3BHK), "Carrowlaverty", Armoy, Co. Antrim.
Belfast.—W. E. Caughey (GI2DZG), 35 Gilnahirk Park, Cherry Valley, Belfast.
Derry.—Dr. J. J. Cosgrove (GI3HXM), "Stacumnie", Culmore Road, Derry.
Portadown.—J. Thompson (GI3ILV), 1 Westland Road, Portadown.

**County Controller.*

Book Review

SINGLE SIDEBAND FOR THE AMATEUR. A digest of *QST* articles prepared by Headquarters Staff of the A.R.R.L. 176 pages fully illustrated, *QST* format. Obtainable from R.S.G.B., price 12/- post free.

This collection of the most noteworthy *QST* articles on s.s.b. must make an instant appeal to all real amateurs. S.s.b. technique is somewhat more complex than A3, but experience seems to show that it is more effective, less costly, and more considerate to others on our crowded bands. It is not unreasonable to think that perhaps a day will come when only s.s.b. telephony will be permitted, and that this might indeed be very beneficial to Amateur Radio. Be that as it may, here is a wealth of practical information on fundamentals, methods, and apparatus, presented in a style and with an accuracy that is expected in A.R.R.L. publications.

The articles have been contributed by more than 30 authors and cover both transmitters and receivers. They have been co-ordinated and edited, so that the book is not merely a reprint; the many small items which have been added give the book an individuality. The balance is well kept; the number of articles on general principles is 11, on modulation and modulators 7, on detection 4, on filter systems 13, on s.s.b. receivers 6, on phasing systems 6, on linear amplifier design and testing 19, and on accessories 10. Let it be said, before making a criticism of one aspect of A.R.R.L. publications, that this new work is timely, attractive, technically in the top grade, and strongly recommended to all R.S.G.B. members.

The A.R.R.L. is primarily concerned with U.S. conditions; this is natural, but Amateur Radio, all over the world, is influenced so much by A.R.R.L. technical publications that the responsibility of the A.R.R.L. is supra-national in this field. This is evidently not fully appreciated at Hartford, for all A.R.R.L. publications are exasperating in one particular detail. One becomes enthusiastic about a clever piece of gear described, and decides to build it—or as nearly the same as one can manage. The list of components almost invariably contains an item which is described as a " 5 plate Dinkie condenser ", or a " Tiny Tim smoothing inductor with 200 turns removed ", and leaves a sense of infuriated frustration in many non-U.S. shacks.

It should be possible to give the electrical dimensions concerned, in international units, in addition to these more colourful descriptions; even if it means that someone has to measure the inductance or capacitance of a specially constructed item. The make and catalogue number of a coil former do not mean anything to a man who cannot obtain one; he wants to know the diameter.

Those who are producing such excellent publications will realise, one hopes, how much more useful the information could be, even perhaps to many U.S. readers.

T.P.A.

New Books

STUDIO ENGINEERING FOR SOUND BROADCASTING. By Members of the Engineering Division, British Broadcasting Corporation. General Editor, J. W. Godfrey. Size 8½in. x 5½in. 208 pages, 108 diagrams, 9 plates. Published, by arrangement with the B.B.C., for *Wireless World*, by Iliffe and Sons, Ltd. Price 25/-.

This book was compiled for the primary purpose of training B.B.C. Technical Staff in the general principles underlying operational procedures at the Corporation's studio centres. It is now made generally available in the belief that broadcasting staff throughout the world, on both the engineering and non-engineering sides, will find a great deal of interest and practical value in its pages. Some of the information is specific, in that it relates to equipment and procedures specially designed to meet B.B.C. requirements, but the greater part of the text, dealing with principles of audio-frequency engineering, has a very general application.

The first chapter explains the development of the chain of acoustic and electrical equipment necessary in transmitting a broadcast programme. Subsequent chapters deal with transmission quantities; acoustics for broadcasting and microphone placing; amplifier equipment; studio technical equipment, including outside broadcasting, recording and other facilities; control rooms and their equipment; programme circuits on Post Office lines, monitoring facilities; and the broadcasting organisation's own communication system.

No effort has been spared to ensure technical accuracy, combined with clear and straightforward presentation. The technical level is practical rather than academic.

FUNDAMENTALS OF TRANSISTORS. By Leonard M. Krugman. 140 pages, illustrated. Printed in the United States and published in the United Kingdom by Chapman and Hall, Ltd., London, W.C.2. Price 21/-.

Essentially practical in scope, this book is intended to serve the initial needs of engineering students and engineers. It should also prove of considerable interest to radio amateurs and technicians. Advanced physical and mathematical concepts have been purposely avoided but the fundamentals necessary to assure a complete understanding of basic transistor operation, performance and characteristics have been included. The section on transistor oscillators describes a number of circuits familiar to amateurs, including the Hartley, Clapp and Colpitts.

The author is a member of the U.S. Signal Corps Engineering Laboratories.

WORLD RADIO-TELEVISION HANDBOOK. Ninth Edition. 160 pages. Published in Copenhagen by O. Lund Johansen. Available in the United Kingdom from Wm. Dawson & Sons, Ltd., London, W.C.2. Price 9/6.

The enthusiastic broadcast listener to overseas programmes for whom this book is chiefly intended will find within its pages all that he wants to know about the activities of the stations he hears, or strives to hear. Details are given of the companies or concerns responsible in each country for broadcasting, followed by a list of addresses, leading personalities, frequencies, wavelengths, powers, interval signals, operating periods and call signs.

The number of channels assigned to short-wave broadcast stations operated by the B.B.C. totals 96, of which number four are in the " exclusive " portion of the amateur 7 Mc/s band and another seven between 7150 and 7300 kc/s.

The book contains a comprehensive list of the short-wave broadcast stations of the world, arranged in order of frequency.

VALVES FOR A.F. AMPLIFIERS. By E. Rodenhuis. 152 pages, 95 illustrations, many tables. Printed in the Netherlands and available in the United Kingdom from Cleaver Hume Press, Ltd., London, W.8. Price 10/6.

This book is an addition to the Philips Technical Library. The first chapter gives general hints on amplifier construction and this is followed by a description of the class of valve suitable for the various stages. Chapter 3 describes specific valves and includes operating data. There is then a short chapter which contains hints on the practical uses of valve data. Chapter 5 describes components and circuits and chapter 6 (practically half the book) gives details of eight different circuits ranging from a 3 watt gramophone amplifier up to a 100 watt amplifier using a pair of EL34s in the output.

The book is intended for the use of radio amateurs interested in the construction of amplifiers. It serves that purpose well.

Silent Keys

G. R. SLAUGHTER (G3WB)

We record with sorrow the death on January 14, 1955, of Mr. G. R. Slaughter (G3WB), of Gainsborough, Lincolnshire. Although he was first licensed in 1936 Mr. Slaughter spent practically the whole of his free time at the bench. He was more interested in experimental work than in transmitting.

During the war he frequently entertained Service personnel stationed in Lincolnshire. He was a staunch Society member who never missed a local meeting.

Our sympathies are extended to his three sisters and one brother.

F. G.

HANS ELIAESON (SM5WL)

His many friends in this country will grieve to learn of the death of Hans Eliaeson (SM5WL), of Bromma, Sweden, on February 17 after an illness lasting several weeks. Hans, whose powerful signal was a Sunday morning landmark on the 14 Mc/s band, was Editor of *QTC*, official journal of the Swedish National Amateur Radio Society for whom he had worked, in an honorary capacity, with great efficiency and enthusiasm for many years.

He will be a great loss to his fellow amateurs in Sweden for, besides being a tower of strength to S.S.A., he was in the forefront of Swedish Amateur Radio in a number of fields, not the least of these being his splendid DX record. He had a warm and lovable personality which endeared him at once to all those who were privileged to meet him. He visited Great Britain on several occasions and was always a most welcome guest. On his last visit, a few years ago, he was accompanied by his equally charming wife Inga-Lisa and it is to her and her two sons that the thoughts and sympathy of their many friends in this country will now be turned. SM5WL will be heard no more but the memory of a kindly and gentle man who was blessed with the happy gift of making friends wherever he went will linger long in the minds of those who knew and respected him so deeply.

A floral tribute was sent to the funeral from the President, Council, Headquarters Staff and Members of R.S.G.B.

A. O. M.

RAY RAGHEB (SU1MR)

It is with deep regret that we record the death of Ray Ragheb (SU1MR) on December 12, 1954, at the Anglo-American Hospital, Cairo. Ray had been ill for some years and was due to fly to England on the day preceding his death.

The outstanding signal put out from his station, operated in conjunction with his wife Margaret, will long be remembered by his friends all over the world.

To his wife and three sons we offer our sincere condolences.

C. R. P.

For Your Bookshelf and Shack

R.S.G.B. PUBLICATIONS

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

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★ ★ ★

SIMPLE TRANSMITTING EQUIPMENT. Full constructional details for three simple but effective transmitters, a stable v.f.o. unit, and a crystal-controlled frequency standard. Information on simple transmitting aerials is also included. (52 pages.) **Price 2/-.**

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Orders for certain of the following American publications can only be accepted from residents in the United Kingdom and British Empire. Prices quoted include cost of postage and packing.

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RADIO ANTENNA MANUAL (Editors & Engineers Ltd.)	27/-
SURPLUS CONVERSION MANUALS, Vol. I & II (Editors & Engineers Ltd.) per vol.	18/6
***THE RADIO AMATEURS' MOBILE HANDBOOK.** (Cowan Publishing Corporation)	17/6
***ANTENNA BOOK, 6th Edition** (A.R.R.L.)	13/6
***SINGLE SIDEBAND TECHNIQUES.** (Cowan Publishing Corporation)	12/6
SINGLE SIDEBAND FOR THE AMATEUR (A.R.R.L.)	12/-
HINTS AND KINKS (A.R.R.L.)	9/6
COURSE IN RADIO FUNDAMENTALS (A.R.R.L.)	4/6
HOW TO BECOME A RADIO AMATEUR, 11th Edition (A.R.R.L.)	4/6
LEARNING THE RADIOTELEGRAPH CODE (A.R.R.L.)	2/6
QST. Monthly journal of the American Radio Relay League. Yearly subscription	36/-
CQ. Monthly publication of Cowan Publishing Corporation. Yearly subscription	29/-

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AC Power Packs, 1000V 500 mA, £4, 450V + 300V both 250 mA 6.3V, £3. Receiver R208 less p.p., £4. T1131 Driver Deck, £1, mA meters 200, 100, 5, .5 mA, 5/- each. Valves 4/- each, 35T, PT15, KT8C, 6L6, 6V6, GU50 6K8, etc. 36 Oakwood Avenue, Borehamwood, Herts. Tel.: Elstree 1040. (541

AERIAL Coils for A.R.88 receivers available, P.C.A. Radio, Beavor Lane, Hammersmith, W.6. (559

AMATEUR requires 25-40W Band-switched cw/phone transmitter (Table-Topper). Might exchange S20, 11 Ridley Drive, Sankey, Warrington. (543

AR77E, perfect condition, manual, Box original spares, R.C.A. matched speaker, £30, Model 40 Avometer, £10, Ronette Crystal microphone, Crystals, etc. Going QRT, London area, Box 545, National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (545

AR88D; S-meter; instruction book; spare valves. Case unmarked. Kept tiptop condition by keen DX man, £48, (£46 if buyer collects.) G2YS, 29 Station Avenue, Filey, Tel.: 3350. (549

AR88D, CR100, HRO and S27 type receivers, and corresponding QRP, QRO and mobile transmitters. Prefer buyer collects. Enquiries BRS 18788, Hastings 5724. (564

ATTRACTIVE QSLs. Send for samples from the Ham Printer, G6MN. Bridge Street, Worksop, stating G or B.R.S. (531

BARGAINS: 6V6, 807 transmitter with 500V, p.p, on 19in, chassis, 7083 kc/s crystal, 2 meters, £4. Modulator pp EL36s 8W with mod. transformer, £5. Signal generator less power pack, 1800kc/s to 80 Mc/s, £5. Twin TZ40s, 150W final on 19in, rack, £4. 600V pack 6.3V, 19in. chassis, £3 10s. 550V 7.5V ditto, but on wood, £2. Seen Birmingham. Particulars free. Box 528, National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (527

BARGAIN: two of each, Rectifiers, 24V 8A, £1, 600V 30mA, 5/-. 8μF 750V oil filled, 4/-, 1μF 1400V d.c., 21/-, .01μF, 5kV d.c., 3/-, PT15, 5/-. Spare for T1154, S.a.e. post extra, V. Cedar, 9 North Drive, S.W.16. (563

B.C.348, Complete with p.p. and speaker in polished cabinet, £15 or offers. L. H. Myles, 11 Burnside Avenue, Stockton Heath, Warrington, Lancs. (527

B.C.342N, receiver in good condition complete with R.F. 24 unit, £25, carriage extra, surplus to requirements. Walters, 23 Alton Road, Bristol, 7. (567

CAN you locate for amateur an R.1155 (Model L or N only; covering 1.8 Mc/s band). Good condition essential. Also would pay £1 for 1155 Handbook. Box 569, The National Publicity Co., 36/37 Upper Thames Street, E.C.4. (569

CLASS D wavemeter, carefully modified for 6V a.c., £4 10s. Wanted: SCR522 modulation transformer. G3HQI, 59 Doncraile Street, London, S.W.6. (555

CLEARANCE, re-equipping, HRO Senior b/s coils and p/p, 5RV 75W TVI-proof transmitter, Double Beam Scope, VHF receiver, 5ft 6in. rack, 2ft 6in. rack, 3 Power Packs, Modulator, p/p 807s, variac, low pass filter, 32ft sectional mast, and large collection meters, valves, relays, condensers, resistors, coil turrets, coils, switches, etc., £110 all, or offer. Buyer collects, Fenton, Gay Bowers, Danbury, Chelmsford, Phone: Danbury 518. (536

COMPLETE compact 40W station 3.5 to 14 Mc/s, B2 transmitter, 2 crystals, spare valves, R1155 receiver as new, output stage, crystal calibrator (less crystal) top band convertor, power packs £16. Wanted: BC348, R107, G3JIC, 11 St. Paul Street, St. Helens. (523

CR100/2, good condition, new valves, needs attention, £15. Premier 9in. TV O.K., £10. Both carriage extra. Stamp for details. 3 Gorecourt Road, Sittingbourne, Kent. Tel.: 429. (544

ELIZABETHAN type transmitter (150W) TVI proof. Working on all bands except 21 and 28 Mc/s (requires alignment). Built in " AR88 cabinet by G4BI." Modulator SP61, 6J5, 6L6, 2X807 in Class B zero bias, £25 10s. or offers. Also transformer 1200-0-1200 at 200mA 220V input, £1, or would exchange for a 250-0-250 at 100mA with 220V input. K. C. Young, 147 Castlewood Drive, Eltham, S.E.9, London. (532

EXCHANGE BC221 complete with calibration book and service manual for Lowther Master tone control unit which must be in mint condition. Box 546, The National Publicity Co., Ltd., 36/37 Upper Thames Street, E.C.4. (546

EXCHANGE Collins TCS10 Transmitter, BC348N and 195/905 kc/s aircraft receivers, Marconi 1250V/250mA power unit, 2/83p.a., for commercial tape recorder. Going QRT, 3 Rockford Walk, Southdene, Kirkby, Liverpool. (542

FOR sale: Clapp v.f.o made by Geloso, Milan. Valve line-up, 6J5, 6AU6 and 6V6. Power requirements 400V 32-54mA. Completely bandswitched 10-80 metres and capable of an output of 3.5mA per band. Further details and drawings on request. As new, £8. BC348 built-in power pack, good condition, £16. Carriage paid. Small Labgear absorption wavemeter covers 4 to 14 Mc/s, 10/-. Q.C.C. crystal 7026 kc/s with certificate, 15/-. G3HJT, 29 Unwin Avenue, E. Bedfont, Middlesex. (570

FOR SALE, R.S.G.B. BULLETIN July 1934 to June 1954 (less April 1935); Wireless World 1950 to 1953, QST October 1947 to September 1950, Radio News December 1947 to November 1953, Offers please. Loveland, 37 Crockford Park Road, Addlestone, Surrey. (526

FOR sale: R1155 (unmodified), £5. R208 a.c., £5. R1132, £5. Power unit type 3, 50/-. Control unit type 1A, £1. Spare valves Radiotone transmitter LS1, 5/- LV1, 5/- EZ12, 5/- GR150DA 5/-. Allen, Colne Meadows, Coppermill Road, Wraysbury, Bucks. (561

GRID dip oscillator, all bands wanted, good price paid. For sale: DET 12s HK54s, TZ40s. Martin, Castlemount, Worksop. (521

G3IDG needs " CQ," January, March, April, June, November, December 1945, May 1946, " Radio " before 1936, " R/9 " before April 1935, " QST " before 1924. Lots " Amateur Radio," " Breakin," " Ham Chatter," " QTC," " Radio ZS," " Xtal," " Calling CQ " (de Soto). 95 Ramsden Road, London, S.W.12. (551

HALLICRAFTERS S20, perfect, £20; matched paid RK28, £5; headsets, 2/6 pair, T20, 25/- pair; R107 with manual, £9, carriage paid. Wanted AR88 speaker, Lawson, 23 Alington Grove, Wallington, Surrey. (537

HAM-built rack mounted p/p 1500V 250mA, 5V 4A. Solid job £7 or offers. Assorted valves, etc. S.a.e. for list. Perkins, G3MA, 40 Calton Road, Gloucester. (525

HRO senior 1,7 to 30 Mc/s bandspread 14 and 28, Speaker, power pack, £22. Woden UM3, 79/-. Reiss microphone, 30/-. TU5B VFO, 50/-. Wanted cheap S640. Lots other gear. S.a.e. list. G2FCI, Little Pleasance, Ashburton, Devon. (547

HRO for sale complete with power pack and coils all bands, two bandspread, in good order, £21. J. Foster, G2JF, Wye College, nr. Ashford, Kent. (552

LABGEAR 5 band turret type 5023, 100pF Eddystone cond type 836. 45/-. Handbook AR88LF, 12/6, BC221, 7/6. Low pass filter 5RV, 35/-. Labgear wave trap, new, 8/-. D. Flowers, 89 Staines Road, Feltham, Middlesex. (550

MAGAZINES, " BULLETINS " 131 issues from August 1942, 15 " Radiocraft " from November 1947/1949, 42 " Wireless World's " from 1946/1950, 7 Brit. I.R.E. Journals 1946/1954, Offers Greenwood, Corner Cottage, East Dean, Eastbourne. (556

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

MORECAMBE holiday, near sea, overlooking bay and lakeland mountains, ham shack, write brochure. G3AEP, " Ferncliffe," Drewton Avenue, Morecambe. (530

(Continued on page 464).

EXCHANGE AND MART SECTION (Cont.)

MUST clear in hurry, don't delay. BC342 less case, £11, BC1147, £20, BC614D Speech amplifier, less odd parts, £12. U.S.A. Dinghy transmitter (S.O.S.), £5. HRO senior with power pack, coils 50 kc/s to 30 Mc/s (9 coils 3 of them b/s), £27. Panda PR120V transmitter altered here and there but good, £75. Evershed 500V Megger, £7. Any decent offer accepted if you hurry, please allow for carriage and packing. Box 539, National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (539

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

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

QST collection for sale, 250 copies from 1933-1955. £10 or nearest offer plus postage. Box 535, National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (535

RCA, RAK7, (USN) 0.3-23 Mc/s, 9 bands, 6V, St rec and p.p. Very good condition, £15. Wanted handbook or gen on same. 26 BULLETINS for sale, 12, 1954, 9, 1953, 5, 1952. Offers Box 565, The National Publicity Co., Ltd., 36/37 Upper Thames Street, E.C.4. (565

SALE: Eddystone 840 receiver, as new, used for less than six hours. Owner is not a ham and receiver is superior to his requirements. Offers to G3LP, 143 Brunswick Street, Cheltenham. (534

SALE, owner going overseas, transmitter 150W phone TVI-proof on 80, 40, 20, 15 and 10m band switched WBCs, Franklin, buf, buf or double parallel 807s, C.R.T. and phone monitor built in. Fully relay controlled. Enclosed in standard rack 30.n. high, £65. Receiver double super "S" meter, £15. BC221 modified for modulator, £20. On air all bands until sold. Consider any reasonable offers near above prices. Box 540, National Publicity Co., Ltd., 36-37 Upper Thames Street, London, E.C.4.

SALE, Receiver R1471 3.0 Mc/s to 30 Mc/s, 5 band turrett, 2RF, mix., oscillator 2 IF., crystal filter, Mains power pack £20. Read, 4 Wendover Drive, New Malden, Surrey. Malden 4459. (529

SALE, Suit beginner, 40W, 7 Mc/s, cw transmitter, 3 decks, p/pack, transmitter, aerial tuner, five meters, 3 crystals, key, all components Eddystone, Dubilier, Cylden, Woden, £15, G3IHT, 99 Woodfield Drive, Romford. (553

STATION for sale, comprising S640, two transmitters, four power units, mod, amplifier, table microphone, v.f.o. crystal calibrator, electronic key, S meter, aerial tuner, specially built table fitted to take above with aerial relay and mains filter, 20ft mast, S.a.e. details and photo. Buyer pays carriage, £55. Box 520, National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (520

TOP band phone/cw transmitter,with microphone and crystal. Requires mains and aerial only to operate, £6. UM2 modulation transformer, £2. Microphone floor stand, 12/6. Power pack 500V, 150mA, 6.3V, 5A, £2 10s. Valves 807, 504, VR150/30, VR105, VS68; Crystals 7051, 7310, all 5/- each. Everything carriage paid. Charlton, 74 Court Way, Twickenham, Middlesex. (548

TRANSFORMER and Filter design Engineer required to take charge of design and manufacture. Qualifications and experience essential. Apply to Personnel Manager, Pye Telecommunications, Ltd., Ditton Works, Cambridge. (560

TRANSFORMERS. Primary 240V. Secondary 250mA, 1750-0-1750 tapped 1250 and 750 £5. Woden DTF12 2.5V 10A CT, 25/-. PCS12 swing choke 5-25H 250mA 27/6. Zenith 10H 250mA choke 10/-. Pair new Raytheon 866 and one used STC 2V/400V lot 25/-. Condensers 2000V working one 1 μF, two 2μF, one 4μF, lot 17/6 or all above £9 15s. Valves: New two 813 42/6 each, used T20 7/6, two Eimac 35T 12/- each, two HF100 10/- each. New RF 26 convertor 28/6. Two Eddystone 2kV 60+60 pf tank condensers 7/6 each. Ferranti 3 inch flush round M.C. mA meters, 50, 100, 150mA 8/6 each. Carriage extra. Lot to clear £19. G5KM, 9 Woodstock Road, Barnsley, Yorks. (524

TRANSFORMER Woden 750V 250mA. Transformer 400V 120mA x 6.3V 145V. Transformer 2.5V 10A twice. Transformer 6.3V 5A, 65V, 195V 85mA. Choke Woden 5/25H 250mA swinging. Choke 10H 250mA. 2 x 866 1 x 5R4. Condensers, bleeders, meter, switched. All on standard chassis and panel complete unit £10. Army 12 transmitter £15. First class condition. 832 and base 25/-. 832 20/-. Buyers collect transmitter and power unit. Lawn, 20 Croft Road, Godalming, Surrey.

WANTED, Aerial tuning units B.C.939a, P.C.A. Radio, Beavor Lane, Hammersmith, W.6. (558

WANTED, B.C.610 Hallicrafters, ET4336 transmitters, AR88Ds and LFs receivers and spare parts for above, also BC221 frequency meters. Best prices, P.C.A. Radio, Beavor Lane, Hammersmith, W.6.

WANTED: HRO coils, receivers, power packs, AR88Ds, AR88LFs, SX28s, BC348s, AR77s, and many other types, also laboratory test equipment and R54/APR4, TN17, TN18 and TN19 units. Details please to R. T. & I. Service, 254 Grove Green Road, Leytonstone, London, E.11 (LEY 4986). (101

WHO wants "Short Wave Mags" 1937/39; "QST" 1935/41; "Radio" 1941/45, "BULLETINS" 1934 to 1947, offers, Barton, 82 Hamsey Green Gardens, Warlingham, Surrey. (566

150W phone/cw transmitter, £17. Receiver chassis home built 20/40/80 one RF; BFO, etc., £5; another 2-RF 2-IF 20m over £4; T1403 (modified) with good power pack, £7 10s., all carriage extra. Edge, Hyfrydle, Chirk, nr. Wrexham. (562

APPOINTMENTS SECTION

Situations vacant

ELECTRONIC ENTHUSIASTS are offered opportunities by J. Lyons & Company in the development and maintenance of electronic computers. A basic theoretical knowledge is the only essential, but radar experience in the Services and some knowledge of directing the work of others would be an advantage. Applications should be addressed to Control Office, Cadby Hall, London, W.14. (568

INDICATING instrument calibrators with moderate technical knowledge and initiative. Good position for the right man in an expanding concern. British Physical Laboratories, Houseboat Works, Radlett, Herts. Radlett 5674. (554

RADIO and Television Service engineer required for expanding company in Slough area. Excellent prospects for rapid advancement for man of proven ability. Write with full details of experience and stating salary required to Telefonic Radio, Ltd. (G3XC), 1 Station Approach, Slough. (538

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SENIOR ENGINEER—with experience of production engineering of prototype electronic equipment, having a working knowledge of Electronic Circuitry.

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SENIOR INSTRUMENTATION ENGINEERS—with a degree or H.N.C. and experience of the design of transducers for electronic or bridge measuring systems.

SENIOR ENGINEER—to lead a group concerned with development and field trials of ground radar. Previous experience essential.

SENIOR RADAR & ELECTRONIC ENGINEERS—for field and flight experiments of radar equipment. Degree or H.N.C. standard preferred but applicants without these standards but with a wide experience of this type of work will be considered.

SENIOR ENGINEER—for missile telemetry installation planning. Applicants must be familiar with existing telemetry systems and measuring techniques. Suitable to a man with trials experience.

JUNIOR ENGINEERS & LABORATORY ASSISTANTS—are required to assist in the above work. Vacancies also exist for Junior Staff with experience or an interest in micro wave techniques.

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All of the above posts are permanent, progressive and pensionable after qualifying period; attractive salaries are offered to the successful applicants. Applications to Dept. C.P.S., 336/7 Strand, W.C.2, quoting Ref. S.A.38E.

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