

THE T. & R.

BULLETIN

THE INC.
RADIO SOCIETY
OF GT. BRITAIN

AND THE
BRITISH EMPIRE
RADIO UNION

Vol. 8 No. 12

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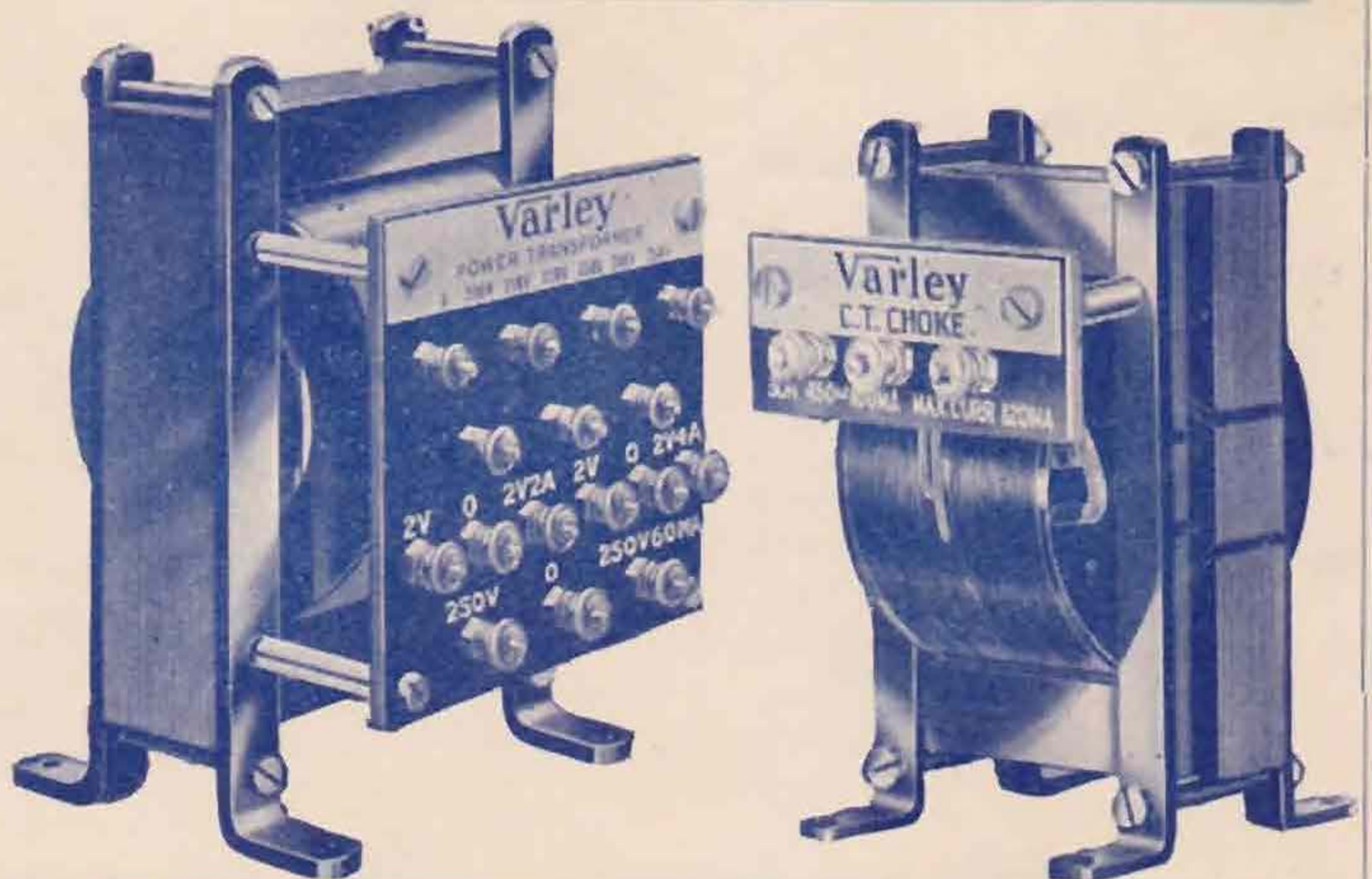
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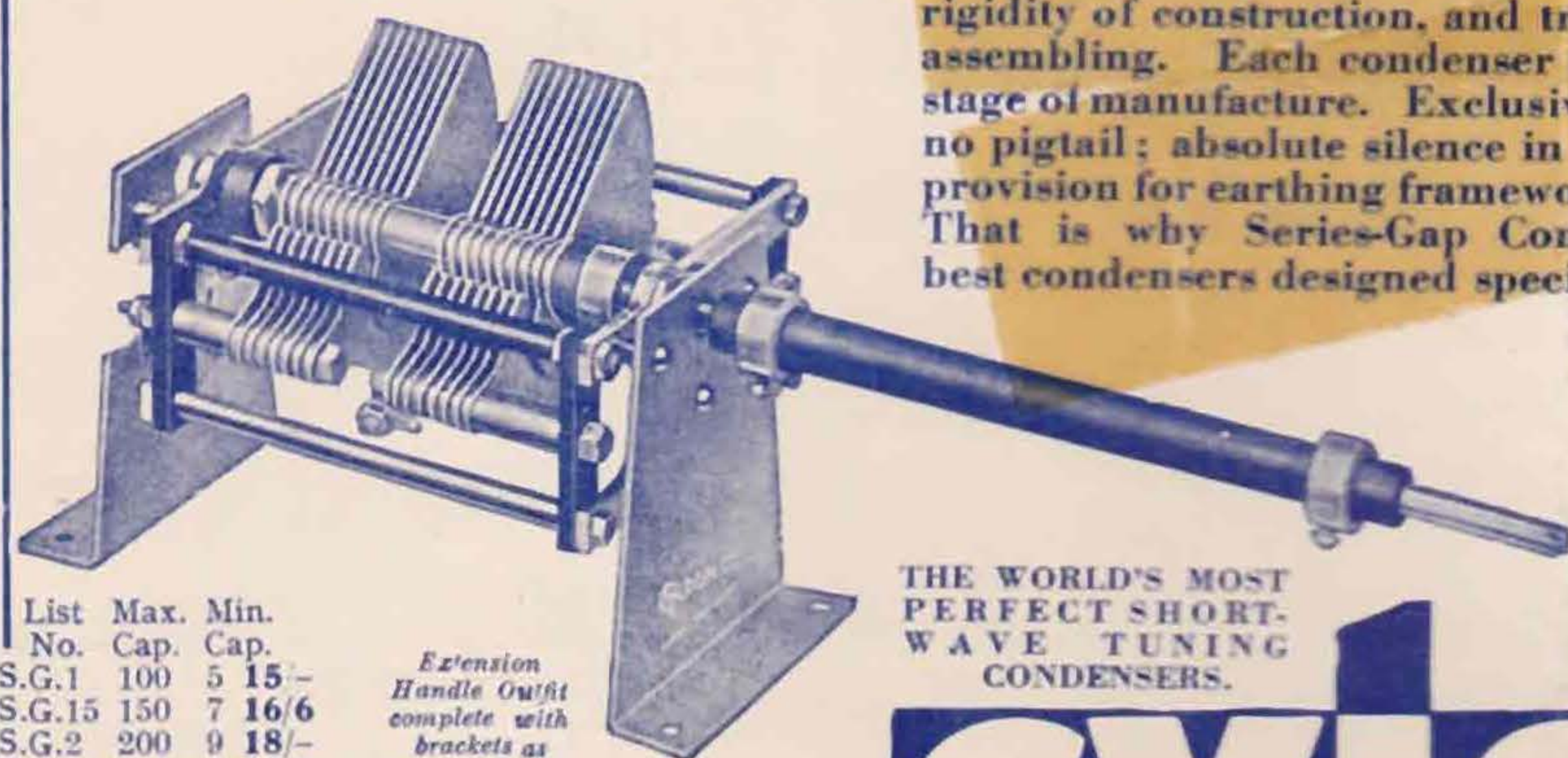
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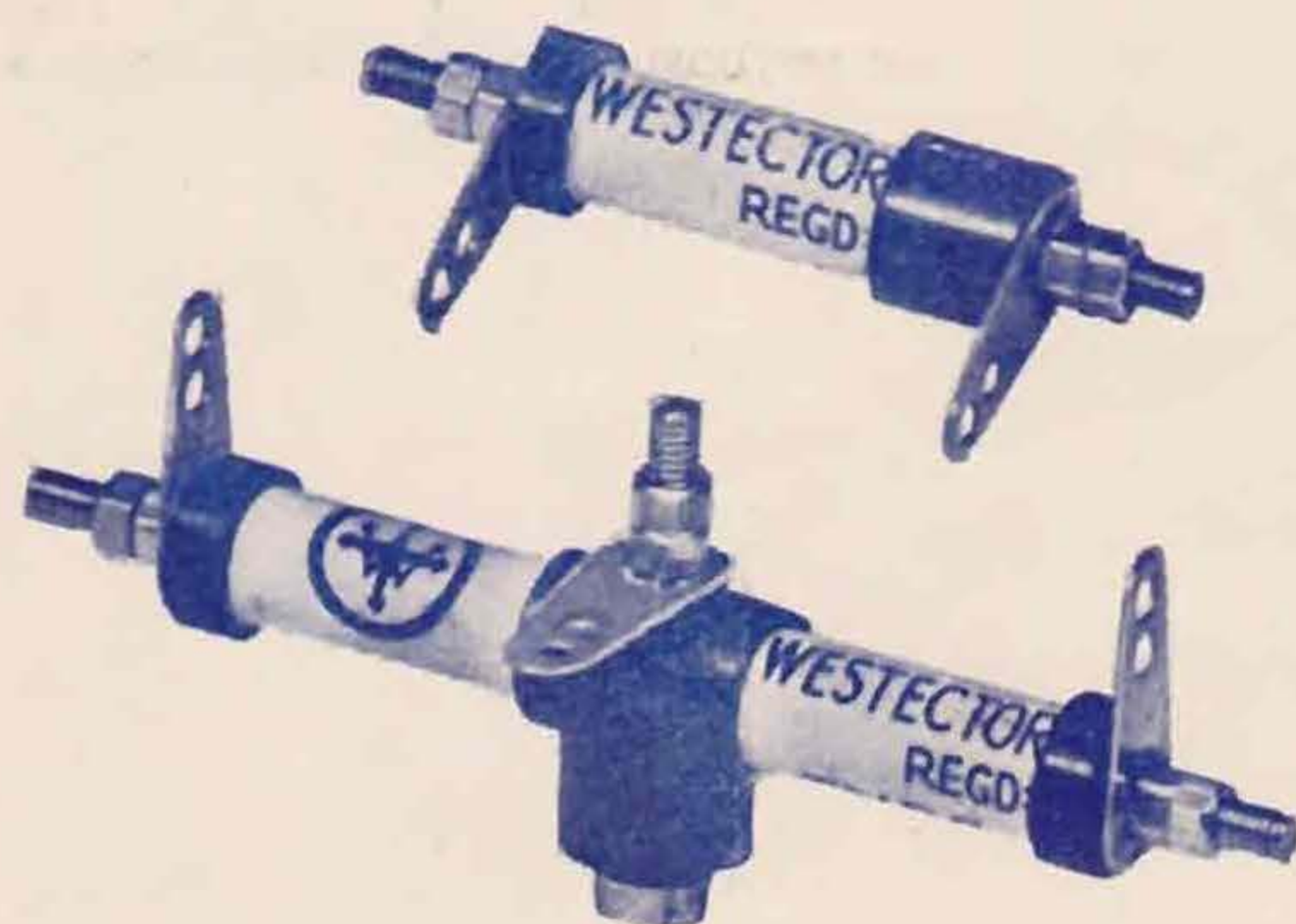
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June 18. District 9 Conventionette
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July 2. District 2 Conventionette
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VOLUME 8, No. 12.

THIS month's issue of the T. & R. BULLETIN sees the completion of Volume 8. It can, we think, be safely said that it has kept up the tradition of former volumes by being just a little better than its predecessor. That was our aim as outlined in the July, 1932, Editorial, and though we have not been able to do nearly all that was planned, we have done our utmost to adhere to the latter part of our slogan—"Bigger and Better Bulletins." To live up to the "Bigger" was beyond the limitations set by the Hon. Treasurer's Department of the Society.

This issue is also the last which the present Editor and Editorial Committee will be responsible for producing, and they desire to thank all members for the very generous way in which they have come forward with useful articles from time to time. Numerous letters of appreciation from both home and abroad are received every month, and we can but offer our thanks in return for their kind words and, in turn, pass them on to the various contributors and helpers not mentioned elsewhere.

To revert from the Editorial We to a more personal strain, I should like personally to tender thanks to the Committee for their assistance during past years; to Messrs. T. P. Allen (G16YW), A. E. Livesey (G6LI), F. Charman (G6CJ) and H. A. M. Clark (G6OT) for their personal services in connection with knotty technical problems; and last, but not least, to Mr. H. Bevan Swift (G2TI) for his careful attention to the BULLETIN during the enforced absence from Editorial duties of some of the Committee during the end of last year.

THE THIRD B.E.R.U. CONTEST.

We publish in this issue the long-awaited results of the Third Annual B.E.R.U. Contests, and we know that all members of the Society will join with us in congratulating Mr. G. G. Samson (ZL4AI), G. H. Todd (VS7GT) and Mr. E. N. Adcock (2BLG, now G2DV) upon winning the Senior, Junior and Receiving Challenge Trophies respectively.

Four important points are apparent from a study of the entry forms. First, the splendid support given by amateurs and amateur organisations in all parts of the Empire. Second, the presence on the air of a large number of Empire stations who do not appear to be active during the rest of the year. Third, the amount of interest shown by amateurs in foreign countries; and fourth, and by no means least, the fact that radio conditions were apparently excellent during the Senior event, and well up to average in most parts of the Empire during the Junior event.

(Continued on page 396.)

A MEDIUM POWER

CRYSTAL CONTROLLED TRANSMITTER

3 VALVES.
200 WATTS.

4 BANDS.
2 CRYSTALS.

A Medium Power Transmitter using two crystals for operation on the 3.5, 7, 14 and 28 mc. amateur bands, employing PM24M, LS5b and T61D valves. It is intended to operate with an input up to 200 watts, and a modulated input of about 100 watts may be expected.

PART I.

FOR some time past it has been apparent that many amateurs are using inputs of 100 or 200 watts with transmitters that are not up to 1933 standard in design or construction. It is hoped that the following description of a medium power transmitter for amateur operation will interest members both at home and abroad. It will be shown that in design the aim has been to produce a set built in a strong frame, with the minimum number of components but of the best quality, and intended more for operation than experimental work. This description should fill a gap in the work so far published in the pages of the T. & R. BULLETIN, being a really practical application of the theory of amateur short wave transmission.

The photographs show the transmitter as a compact unit, all R.F. apparatus being contained in the upper half, while the lower half is intended to house transformer and rectifier equipment for operation from A.C. mains. Part 2 * of this article deals with such apparatus, together with details of the keying and modulating systems. It will thus be seen that the R.F. portion proper only is dealt with in this issue.

* Part 2 will appear in the August issue.

The transmitter contains three R.F. stages, and is intended for operation on the 3.5, 7, 14 and 28 mc. amateur bands. These are the four main bands on which amateurs are permitted to use high power in this country, as licences for the 1.7 mc. band are not issued for inputs above 10 watts. The construction of apparatus for the 56 mc. band requires extra special care, and a separate transmitter is frequently used for this band.

In conventional transmitters a crystal oscillator may energise the aerial direct if lower power on the fundamental frequency of the crystal is required. If higher power is required, one or two stages of neutralised amplifiers are used. When, however, the frequency at which the aerial is to be excited is some multiple of the crystal frequency, one or more frequency multiplying stages followed by a power amplifier (neutralised) are very frequently used.

Two crystals are used in this transmitter, one in the 3.5 mc. band and the other in the 7 mc. band. The choice of these two crystals is controlled by a two-way switch on the panel called the "Crystal Selector" switch. A twin holder is provided and, once placed in position, the crystals should never require attention, except for an occasional clean.

A further switch on the panel, called the "Valve Selector" switch, allows the choice of one or two of the valves prior to the power amplifier valve being used. If No. 1 valve is a crystal oscillator, No. 2 acts as a frequency doubler. No. 1 can, however, work at 3.5 or 7 mc.; the output from the frequency doubler is therefore 7 or 14 mc. For operation on 3.5 mc. the crystal is connected to the second valve (by means of the valve selector switch), and this is followed by direct amplification by the power amplifier. The 7 mc. crystal may be treated in a similar manner. If the power amplifier valve acts as a second doubling stage, an output on 28 mc. may be obtained.

By means, therefore, of two crystals and three stages there are available one point in the 3.5 mc. band, two points in the 7 mc. band, one point in the 14 mc. band, and one point in the 28 mc. band.

Interchangeable coils are provided where necessary, but this point is dealt with later.

The question of aerial tuning always presents difficulty when planning a set which may be used by different amateurs, each with their favourite aerial. Provision has been made for a parallel tuned aerial system such as is frequently used with Zeppelin feeders. Any alteration to series tuning will offer no difficulty to the constructor, and it may be that both series and parallel will be required, depending upon the frequency band in use.

One word of warning—when using "direct-on" aerials with neutralised power amplifiers, the neutralising capacity may need adjustment with change of aerial tap, or change of band. When, however, a coupled aerial is used, the valve in use will remain properly neutralised, irrespective of aerial coupling, or frequency in use.

Having given a brief account of the type of transmitter being described, the detailed construction of the frame and the various stages will follow, and Part I will conclude with notes on the operation.

General Construction.

Frame and Screen.

The framework consists of angle-iron, and measures 30" × 18" × 16". At a distance 15" from the base two wooden lengths of 1" × 1" are fixed to each side to take the base board of the transmitter. The lower compartment is to house the power supply on a second base-board mounted 1 in. up from the extreme bottom of the frame. The transmitter baseboard consists of a piece of 5-ply 18" × 16". The framework may be covered entirely with 5-ply in order to exclude dust and dirt, with sides and back removable. These could be fitted with ball-catches, and fit between the top covering of the frame and a 2-in. wide strip of 5-ply bolted to the bottom of the back and sides. The top covering will also carry the two stand-off insulators for aerial connection.

The screening box for Nos. 1 and 2 stages is made of copper gauze of 16 mesh, stretched on a framework with removable end pieces. The framework measures 18" × 9" × 8", is constructed of 1" × 1", and just fits between the two side angle-pieces of the front iron framework. The screen therefore consists of a top and back, and two removable ends. The screening of the front and bottom is gauze, attached to the panel and underside of the base-

board respectively. The removable end pieces are fitted with ball-catches which serve to make contact to the rest of the screen. The front piece of gauze is taken below the baseboard and soldered to the bottom screen. A wire soldered to the back of this is taken up through the base-board to make contact with the back of the screen.

In order to keep dust out of the interior the whole screen may be given a coat of fairly thick celluloid solution. This will dry and form a transparent covering to the screen, which will be dust proof. Care must be taken, however, to leave a small amount uncovered in order to ventilate the interior.

When the screen is complete and ready for fixing, the construction of Nos. 1 and 2 stages should be complete except for the connection from the anode of No. 2 stage to the coupling condenser in the grid of the power amplifier. It will be found quite easy to remove valves, crystals and coils through the ends of the screen.

The panel is of black paxolin, matt finished, suitably engraved. The dials of the power amplifier tuning and aerial tuning condensers are standard Cyldon 4 in., and the dials of the tuning condensers of Nos. 1 and 2 stages are standard Indigraph.

The three meters shown in the photograph are Ferranti, two being 0-50 ma., and one 0-500 ma. The left hand one is for the plate current to No. 1 stage, the middle for No. 2 stage, and the right hand one for the power amplifier. Although the power amplifier valve is unlikely to run at more than 200 ma., a 0-500 milliammeter was used in preference to the next lower reading available, 0-150 mas., as with a T61D, for example, fully driven and mis-tuned, an anode current of 300 to 400 mas. is possible.

Stages 1 and 2.

In order to assist a newcomer to amateur radio, it may be as well to give a few brief facts concerning crystals.

The quartz crystal is used to control this transmitter because it possesses certain valuable properties. When it is subjected to an electric strain it contracts (or expands) and similarly, when subjected to pressure (or tension) will produce an electric strain between its faces. Thus if an alternating potential is applied we shall have a mechanical oscillation of a definite frequency, providing the alternating potential applied corresponds to the natural frequency of the quartz crystal. The dimensions of the crystal govern its natural frequency.

In practice the crystal is supported between two flat plates, usually connected between grid and filament of a valve, in the anode circuit of which is a coil and condenser. Oscillation is obtained when the anode circuit is tuned to very nearly the natural frequency of the crystal, the necessary feed-back being obtained through the valve capacity in the usual way. It will be seen therefore that the crystal takes the place of a tuned grid circuit.

Now a few words concerning frequency doubling.

When we have obtained oscillation of a definite frequency from the crystal, we require to multiply that frequency a certain number of times in order to obtain oscillations at the frequency at which

we wish to transmit. To do this we use the frequency multiplier, usually called frequency doubler, because in practice it is easier to deal only in second harmonics which give us a relationship between all the amateur bands. Its function is quite simple; the grid of a valve is supplied with oscillations from the constant frequency source, a tuned circuit being connected to the anode of twice the frequency of the supplied oscillations, or driving source. Then if the valve is biased back so that the resultant wave-form is rich in harmonics, a large amount of high-frequency energy will be found in the anode circuit, whose frequency is exactly twice that of the driving source. This process may be repeated several times, although as the frequency is increased it will be found that the efficiency of the frequency doubler falls off.

immediately in front of this is the Eddystone high frequency choke. The coil holder is to the right of this, with the anode by-pass condenser just in the rear. The fixed condenser in the foreground is the grid-choke by-pass. The vertical fixed condenser seen between the crystal holder and the bottom of No. 1 stage tuning condenser is the grid coupling condenser for No. 1 valve.

The construction of No. 2 stage, seen on the left in the photograph, is identical with No. 1. The only exception being that the anode by-pass condenser, having to withstand a greater high tension voltage, is of the vertical 500-volt working type.

Returning to No. 1 stage tuning condenser, C_1 in the diagram, this has a capacity of .0005 mfd., the reason for this being that it is intended to tune

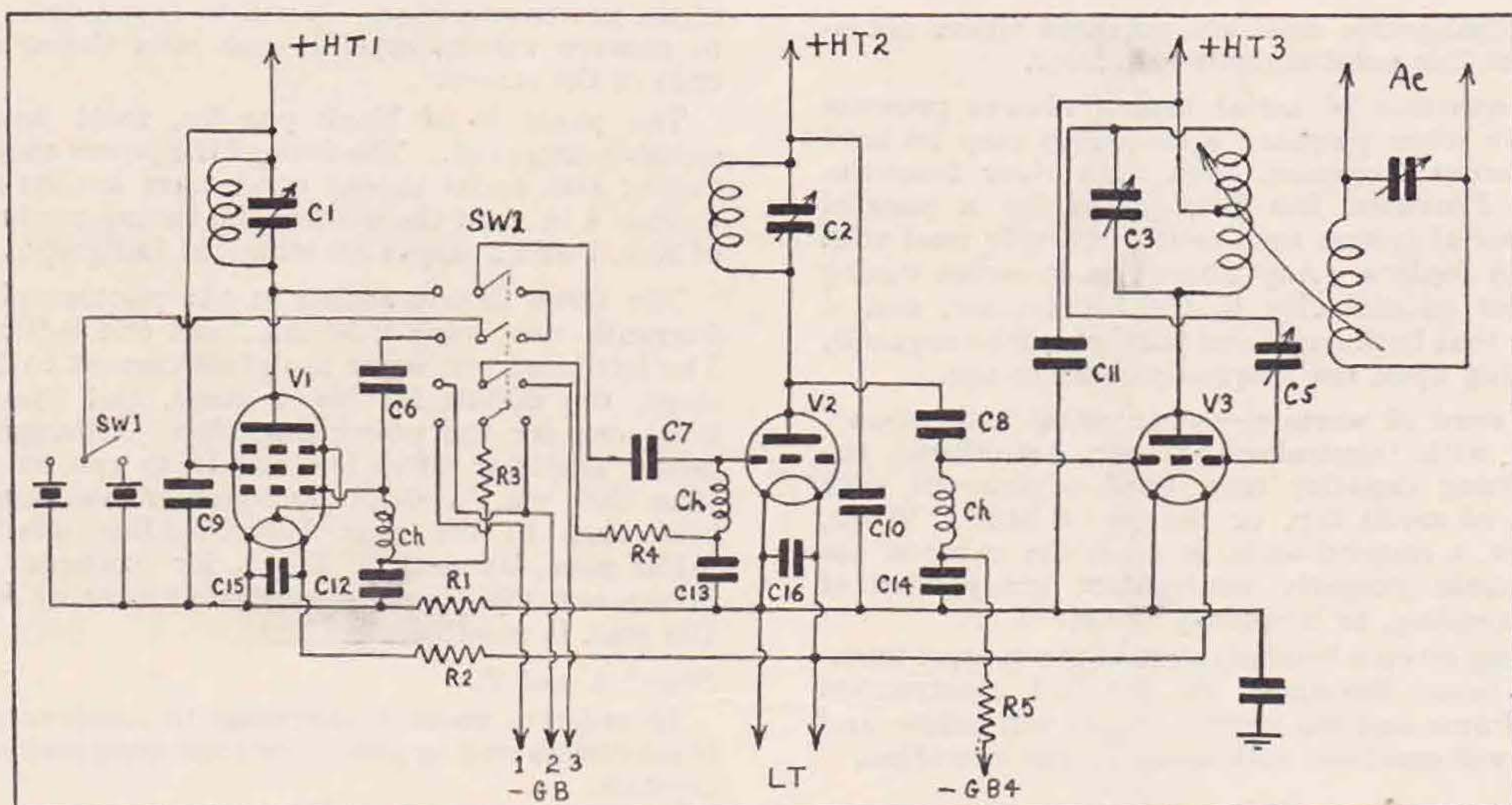


FIG. 1.

Complete circuit diagram of the H.F. part of the crystal controlled transmitter.

- C_1 —0005 mfd. Cyldon receiving.
 C_2, C_3 —0001 mfd. Cyldon transmitting.
 C_4 —00015 mfd. do.
 C_5 —See text.
 C_6, C_7 —002 mfd. TCC upright, Type 34.
 C_8, C_{10} —002 mfd. TCC 500v. working.
 $C_9, C_{12}, C_{13}, C_{14}$ —002 mfd. TCC flat, Type "S."
 C_{11} —002 mfd. TCC 2,000 volt working.
 C_{15}, C_{16} —2 mfd. T.C.C., Type 50.

- R_1, R_2 —One ohm.
 R_3 —5,000 ohms, spaghetti (Burne-Jones).
 R_4 —10,000 ohms, spaghetti (Burne-Jones).
 R_5 —10,000 ohms, Varley 10-watt type.

SW_1, SW_2 —Utility switches (crystal selector single pole change-over and valve selector four pole change-over). Ch—Eddystone chokes. Valves, coils, grid bias and H.T. values—see text.

It may be stated here that it is quite general to obtain amplification of high frequency energy through one or more frequency doubling stages.

* * *

Referring to Fig. 2; this is a photograph, taken from the back, showing stages 1 and 2 before the addition of the power amplifier, and with the copper gauze screen removed. In the centre will be seen the two Eddystone valve holders, behind which is the Q.C.C. twin crystal holder, and behind this again, and mounted on the panel are the two selector switches. The switch on the right is the crystal selector, and wires to it can be seen going up from the crystal holder. To the right of this again is the No. 1 stage tuning condenser, and

one coil to both the 3.5 and 7 mc. bands. The coil is, of course, not interchangeable, and is only mounted on a standard holder for the sake of convenience.

The gauze seen at the back in the photograph is that portion of the screen attached to the panel, and is suitably cut to allow for the mounting of the switches and condensers.

The valve selector switch, SW_2 in the diagram, is wired so that the two sets of contacts carrying high frequency are to the front, the foremost set operating in the anode circuit of No. 1 stage and the grid circuit of No. 2 stage. This is shown as the top set of contacts in the diagram. The contacts carrying grid bias are consequently nearest the panel, and the wires carrying high-frequency

are kept short. The reason for the grid bias switching is to allow (1) the bias on No. 2 stage to be automatically changed when this stage is being used as a crystal oscillator, and (2) the bias on No. 1 stage to be raised to such a point as will prevent anode current flowing when this stage is not in operation. It is obvious that No. 2 stage will require two entirely different values of grid bias depending on whether the stage is used as a crystal oscillator or frequency doubler. The grid resistances R_3 and R_4 in the diagram are Burne-Jones spaghetti type and of 5,000 ohms and 10,000 ohms resistance respectively.

The resistances R_1 and R_2 in the diagram are in the filament wiring to No. 1 valve, which is a FM24M, a directly heated pentode, with a filament consumption of 4 volts 1 ampere. As the filament

grid choke by-passing condensers, so that the connections to and from these may be as short as possible.

It need hardly be stated that all leads carrying high frequency, in addition to being kept as short as possible, should be of a large gauge solid wire. *The Power Amplifier.*

This set is intended for use with valves of the DET1S/W or T61D type. These are valves capable of handling 150 watts and, in some cases, higher. This point is dealt with in the concluding section.

A study of the characteristics of these valves will show them to be medium impedance valves with a high mutual conductance. With an anode dissipation of 60 watts an input of 200 watts is within limits. A most important point in power

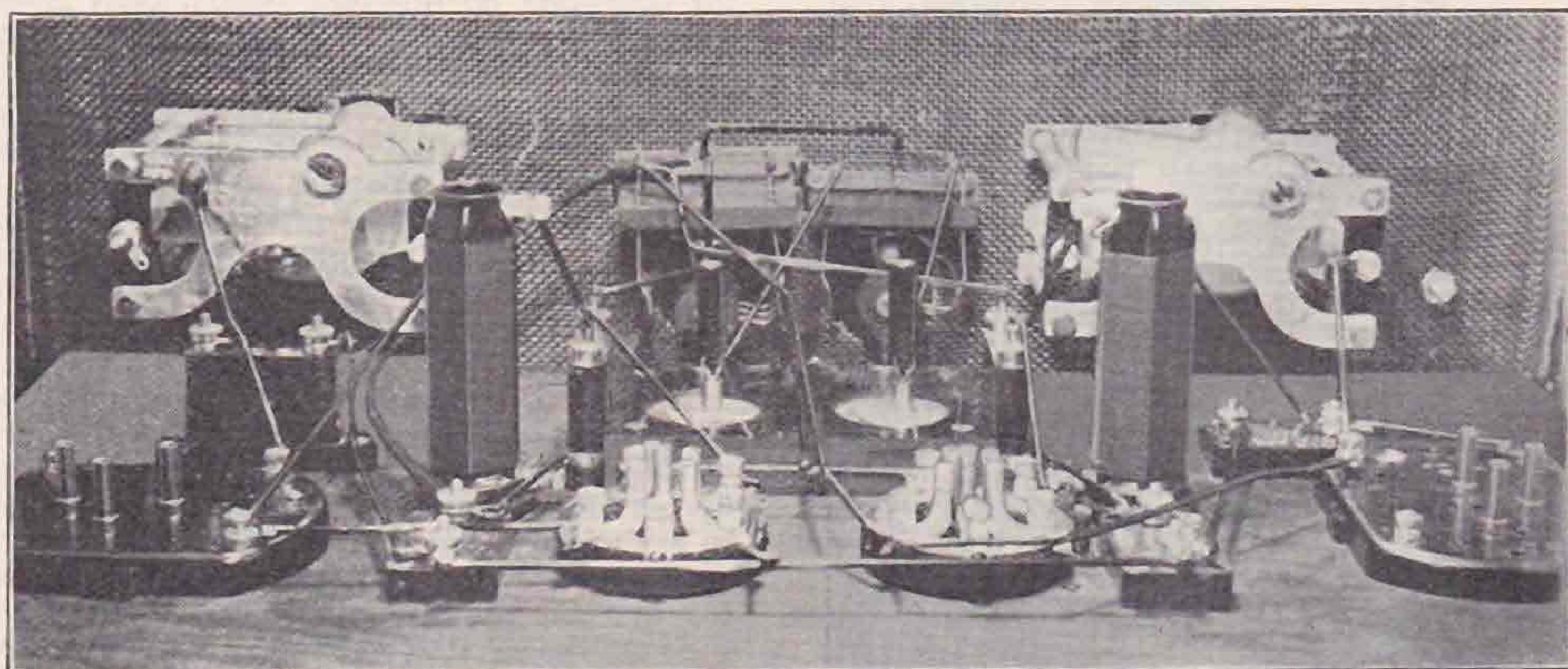


FIG. 2.

Photograph showing the details of Nos. 1 and 2 stages taken from the rear with the screen removed. Note the positions of the components and the short wiring obtained. The length of this compartment is less than 18 ins.

supply to the whole transmitter is 6 volts*, these small voltage dropping resistances are necessary. Their value is, of course, 1 ohm each.

Across the filament of each of the two valves is a 2 mfd. condenser, C_{15} and C_{16} in the diagram. These condensers are mounted on the underside of the baseboard, immediately below their respective valves.

All grid bias and high tension wires are taken through holes in the baseboard, drilled near their points of connection, and are wired in rubber covered flex.

It is impossible to over-emphasise the importance of taking all points of zero high frequency potential to the filament connection by the shortest possible path. The filaments of one valve must be linked to the next valve by a correspondingly short lead.

Referring to the photograph, Fig. 2, examples of this can be seen in the placing of the anode and

amplifier design is the provision of adequate filament emission. Unlike amplifiers dealing with L.F. currents, an amplifier such as is employed in this transmitter is heavily biased to cut-off point when undriven. A drive of such magnitude is then provided that the grid is swung well into grid current. By working under these conditions with high anode volts an efficiency of 65 per cent. on 7 mc. is possible. There is, however, an optimum drive to give highest efficiency; although an increase above this optimum value increases the output it does so at the expense of a considerably greater anode input power.

The positions of the components in the power amplifier circuit should be clear from Figs. 3 and 4. The valve holder is mounted on 2-in. ebonite legs, and the coupling condenser (C_8 in the diagram) is between this and the screen. In this position the lead from the anode circuit of No. 2 stage is kept very short and passes through a small hole in the screening to the coupling condenser. The H.F. choke, choke by-pass condenser and grid leak are mounted near the valve holder.

The neutralising condenser (C_5 in the diagram)

*An additional note on this appears in part 2 with special reference to the T61D valve.

can be seen in Fig. 3 to the right of the vertical frame. It is secured to the baseboard by a short strip of paxolin in order that it may be so placed to admit of very short wiring.

As no make of condenser on the market was suitable for neutralising a medium power transmitting valve, one had to be made for the purpose. The aim was to obtain maximum leakage path without introducing difficulties in construction. Two pieces of paxolin, $\frac{3}{16}$ in. thick, were used as end plates. One end plate was drilled to carry

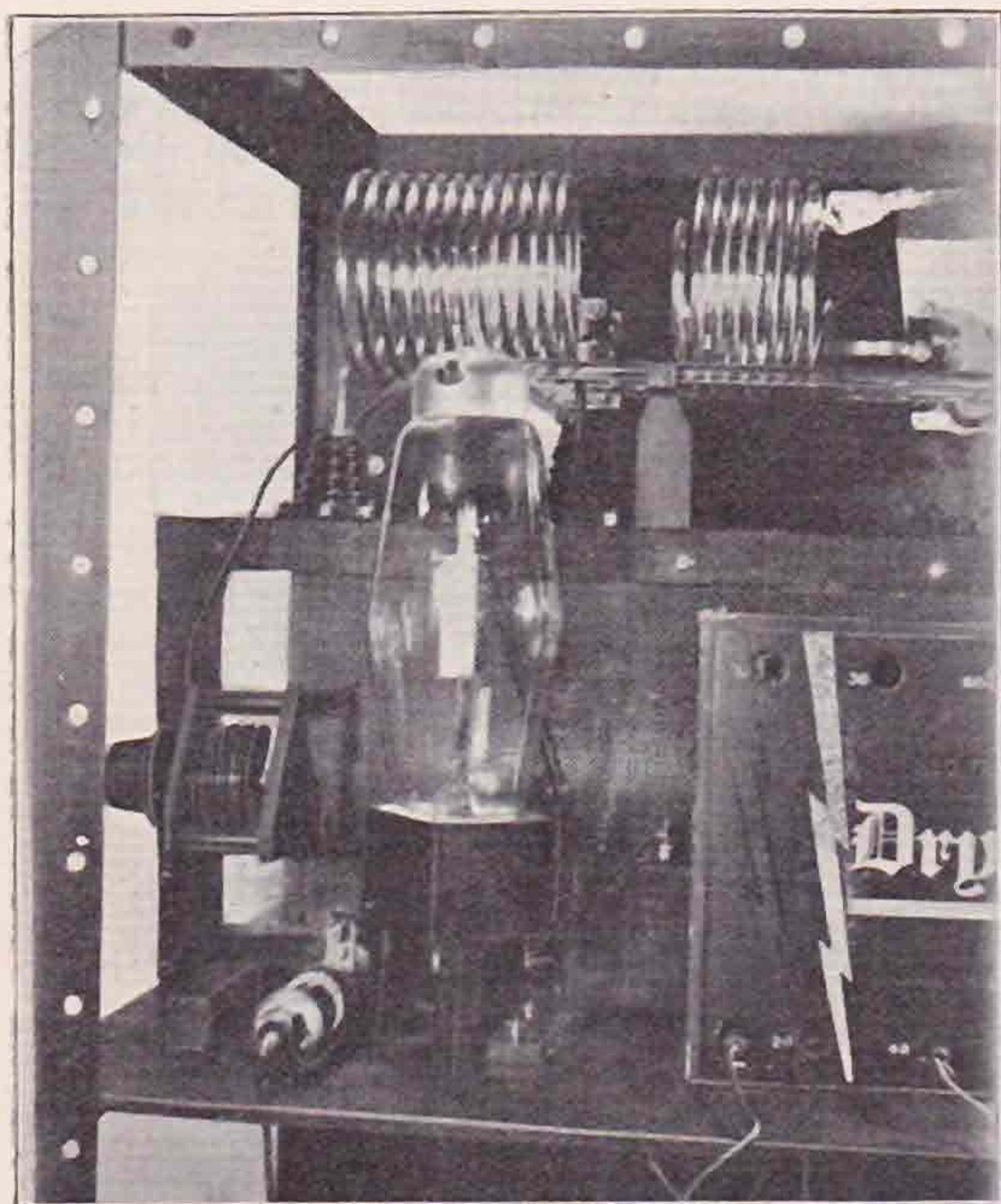


FIG. 3.

Shows the Power Amplifier stage. The neutralising condenser is clearly shown to the left of the valve. The H.F. choke in the grid circuit is hidden by the valve. Part of the grid bias battery is visible to the right. The coils shown are (left) the anode coil and the aerial coil for 7 mc. The glass rods (on which the latter coil slides), together with one of the wooden pillars supporting them, are clearly visible.

the rotor only, and the other the stator only. Three lengths of ebonite tube, $1\frac{1}{2}$ in. long, were used as distance pieces between the end plates and held by short screws at each end. A leakage path of some 5 ins. was obtained by this means. The stator consists of five vanes, $1\frac{3}{4}$ in. diameter, and the rotor four vanes. These are standard midget condenser vanes, and the spacing between adjacent fixed (or moving) vanes is $\frac{1}{4}$ in., giving a clearance of almost $\frac{1}{8}$ in. between vanes.

It was impossible to employ a midget condenser double spaced for the purpose, as the clearance between the rotor with its spacing washers and the nearest edge of the stator vanes was insufficient and flash over occurred.

The minimum capacity of this condenser is very low, and the maximum about 25 mmfds. This is

ample for neutralising the valves mentioned at the head of this section or for any similar valve.

The neutralising capacity required for a T.61D valve is about 10 mmfds, and that for a DETISW about 7 mmfds. It will be seen, therefore, that the maximum of this condenser could be considerably reduced.

Three Eddystone stand-off insulators, fitted with sockets, are screwed on the back edge of the wooden frame making up the screening box for Nos. 1 and 2 stages. These are to take the power amplifier anode coil, and are placed so that their flanges just touch; the distance between sockets is, therefore, the same as the diameter of the base of the insulator. The relative positions of the insulators with regard to other apparatus can be seen from the photographs.

The anode coils are, of course, interchangeable for operation on different bands, their sizes being found from the table. For the purpose of neutralising these coils are centre-tapped.

The anode tuning condenser, C_3 in the diagram is a Cyldon .0001 mfd. transmitting type. The aerial tuning condenser is a .00015 mfd. similar type. The method of fixing these condensers requires a little explanation. The mounting brackets and extension outfits supplied are employed, as it is obvious that both rotors and stators of these condensers are at H.F. potential.

A wooden crossbar, $1" \times 1"$, is cut to fit between the side angle pieces at the top of the frame. The condensers are mounted by means of the brackets, upside-down on the lower side of this bar, but in order to lower the condensers a little, two further pieces of wood, $1" \times 1" \times 4"$, are fixed between the cross bar and the mounting brackets. This position of the condensers allows the 4-in. dials to be suitably placed with regard to the top edge of the panel. The extension rods are cut to 2 ins. long.

As the aluminium brackets were used it was considered advisable to employ American white wood for both cross bar and additional blocks. If paxolin supports had been used it would not have been necessary to take this precaution.

The mounting for the aerial coil for a universal set, such as this, presented some difficulty. The following scheme has been adopted, and although not perfect, has proved very satisfactory, being easily adaptable to various types of coupling.

Two glass rods, $10\frac{1}{2}$ ins. long are fixed $2\frac{1}{4}$ ins. apart and $2\frac{1}{2}$ ins. above the screen on two wooden T-pieces fixed in line with the three stand-off insulators on the screening box frame. The position of these rods, visible in the photographs, is carefully chosen so that the aerial coil may be very tightly coupled to the anode coil when desired. On the other hand, the length of the rods allows very loose coupling also. Connections between the aerial tuning condenser and coil is made with lengths of copper tape, terminating in strong clips. This makes a firm connection and allows the coil to be moved easily.

Two Eddystone stand-off insulators complete with the wing nuts are fixed to the front of the wooden top covering of the frame and serve as aerial terminals. The connections between these and the aerial condenser pass through large holes in the wood.

Operation.

Bias and H.T. Valves.

No. 1 stage is intended to operate at a maximum anode voltage of 250, while No. 2 stage should have a maximum of 450 volts on the anode. Both anode

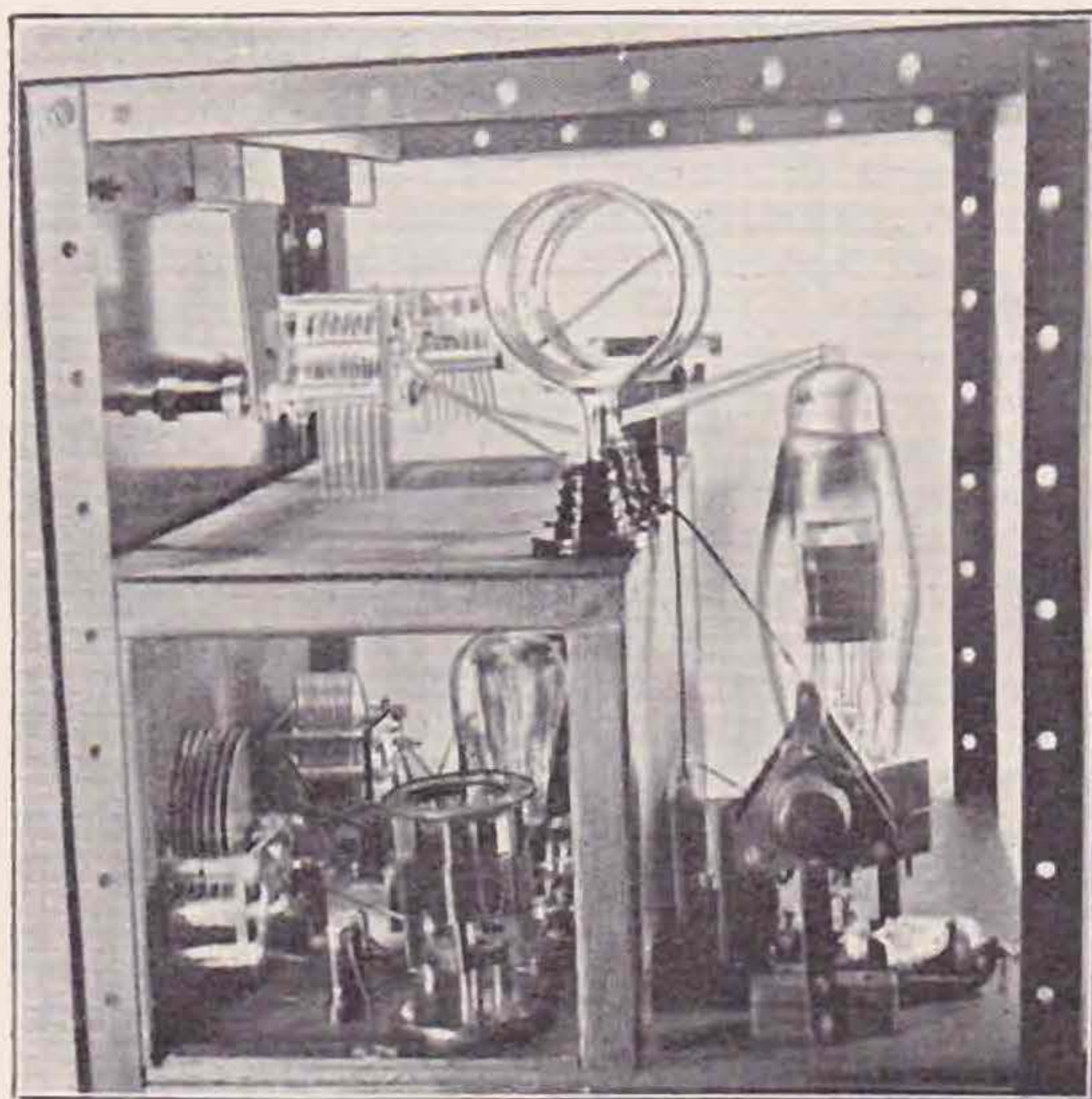


FIG. 4.

This is a view of the right-hand side of the transmitter, showing the disposition of the Power Amplifier apparatus with respect to the screen. Some of the apparatus of Nos. 1 and 2 stages can be seen as the ends of the screening box have been removed; the coil, condenser and valve in the foreground belong to No. 2 stage.

and auxiliary grid of the first stage work at the same voltage, and the milliammeter shows the total current to this stage. The power amplifier stage is supplied with a maximum of 1,200 volts.

GB1 in the circuit diagram biasses the grid of No. 1 valve (crystal oscillator) when in use. This

value should be about 25 volts, which allows an anode current of 15-20 mas. when this stage is not oscillating.

The bias for No. 2 stage when used as a frequency doubler is obtained from tap GB2. This value should be about 100 volts for the anode voltage stated above. When the valve selector switch Sw2 is in the opposite position, so that No. 2 stage is a crystal oscillator, the high bias from GB2 is transferred to the grid of No. 1 valve, so that no anode current shall flow. The grid of No. 2 valve then receives its bias from tap GB3. This value is about 10 volts.

The switch Sw2 should never be left in a neutral position, as otherwise both these valves will have their bias disconnected.

The bias to the power amplifier will naturally depend on the valve used, and the H.T. supplied to its anode.

If this valve is a T61D, the bias value for 1,000 volts H.T. is about 70 volts. This is approximately cut-off point, to which a power amplifier valve should always be biased. By "cut-off," it is meant that valve of grid-bias which just prevents anode current from flowing when the valve is in a non-oscillating and non-driven state. The value of bias for any valve can readily be found, therefore, by reference to the makers' curves.

Tuning.

The following remarks on the adjustment of this transmitter will apply to operation on the 7 mc. band from a 3.5 mc. crystal. With the filament of the valves switched on and 7 mc. coils in No. 2 stage and the power amplifier, the crystal selector switch should be turned in the correct position for using the 3.5 mc. crystal and the valve selector switch to its No. 2 position, indicating that all valves are in use.

When the H.T. to No. 1 stage is switched on, this valve should pass about 15-20 mas. With the condenser at about 75°, oscillation should be obtained, and the milliamps will rise to about 30.

A further test of oscillation may be made by

COIL TABLE.

| | 3.5 MC. | 7 MC. | 14 MC. | 28 MC. |
|-----------------|--|--|---|---|
| No. 1 Stage ... | 10 turns spaced 10 to inch | 10 turns spaced 10 to inch | — | — |
| No. 2 Stage ... | 27 turns spaced 12 to inch | 10 turns spaced 10 to inch | 4 turns spaced 5 to inch | — |
| P.A. ... | 26 turns centre tapped, spaced 6 to inch | 12 turns centre tapped, spaced 3 to inch | 6 turns centre tapped, spaced 3 to inch | 4 turns centre tapped, spaced 1 to inch |
| Aerial ... | 15 turns spaced 6 to inch | 7 turns spaced 3 to inch | 5 turns spaced 3 to inch | 3 turns spaced 2 to inch |

Coils for Nos. 1 and 2 stages are wound on standard 6-pin formers, supplied by the Quartz Crystal Co. The power amplifier coils are supplied by Loomes Radio; that for the 3.5 mc. band is wound with 14-gauge enamelled wire on a 3½ in. Becol former. The 7, 14, and 28 mc. coils are self-supporting copper tube. All power amplifier coils are terminated in stout plugs to suit the sockets in the mounting insulators.

using the familiar Neon lamp or a flash lamp bulb in a single turn of wire. Either of these indicators should be satisfactory. If the H.T. is now switched on to No. 2 valve, the anode current to this should exceed 50 mas., the maximum to which the meter reads. Upon tuning this stage to resonance a drop in milliamps to about 30 will be obtained. The Neon lamp or flash-lamp bulb may again be used as a test on the anode circuit of this valve.

It may be as well to mention here that as the filament of the power amplifier valve is alight, considerable grid current will flow in this valve and place a comparatively heavy load on the previous valve. As, however, the grid current in a valve falls when power is applied to the anode, a high feed to No. 2 stage, with frequent heating of the plate, when the set is being adjusted, need not cause alarm. It will also be found that the higher the input to a loaded power amplifier (obtained by raising the anode voltage as much as possible) the lower will be the input to No. 2 stage. As this input falls, so will the anode voltage (H.F.) rise, and so we see that the greatest driving ratio (input power of power amplifier to input power of No. 2 stage) is obtained with high H.T. volts (hence high anode power) on the power amplifier. Driving ratios of over 1-10 are easily obtained by this means.

The next point to consider is neutralisation, and it is assumed that no H.T. has been applied to the final stage. As the power amplifier anode coil is centre-tapped, and this point "earthed," for any H.F. voltage induced at one end of this coil there will be induced an equal voltage at the other end, but in phase opposition. Such voltages can only be induced when the anode coil is in tune with the anode coil of No. 2 stage (or with its harmonic), and this latter coil may be rightly regarded as the grid coil of the power amplifier. H.F. leakage between circuits could cause this induced voltage in the anode circuit, but shielding has been provided to minimise this. Hence the grid-anode capacity of the valve is the path for this induced voltage. To effect neutralisation, therefore, we insert an additional capacity between the end of the anode coil remote from the anode and the grid. This is known as the neutralising capacity, and it will be seen, therefore, that equal voltages, of the same phase, would *tend* to be induced at opposite ends of the anode coil. As the only coupling that should exist between grid and anode circuits is the grid-anode capacity of the valve, it is obvious that this capacity is now cancelled and no H.F. voltages or currents can be induced from the grid to anode circuit. Similarly, induction in the opposite direction cannot take place, and it is this feedback from anode to grid circuit that we wish to prevent in order to obtain stable operation of the power amplifier.

Still with no H.T. on the final stage, neutralisation may be effected by the following means. It is desired to find a value of neutralising capacity such that there will be no change in the load of No. 2 stage, when the tuning of the anode circuit of the amplifier passes through resonance, as it has already been stated that voltages will only be induced in the anode circuit when it is in tune with the grid circuit. The Neon lamp or "single turn bulb" as an H.F. indicator on the driving circuit is a simple yet effective test. A point should be

found on the neutralising condenser such that no flicker can be noticed on this indicating device when the anode circuit of the amplifier passes through resonance. In practice this will be found to be a very simple operation.

The H.T. may now be switched on to the power amplifier stage and the circuit tuned to resonance, i.e. until the feed current is a minimum.

It is not intended to deal at length with the adjustment or tuning of the aerial. Some form of H.F. indicating device should be included in the aerial lead-in or feeder system. If a coupled system is used, the tuning and coupling should be adjusted so that a reasonable load is placed on the power amplifier, indicated by an increase in the anode feed current, and at the same time the ammeter in the aerial or feeder will give an idea of the current in the aerial.

With a tapped-on form of aerial, the tapping of this point on the amplifier anode coil must be found with care, the usual indicating device for this type of aerial being a voltage indicator, such as neon lamp. Frequently with this type of aerial, the power amplifier will require to be re-neutralised after the aerial has been connected owing to the unbalancing of the anode coil capacities.

It is an excellent point to neutralise with any form of aerial coupled to its required degree, but this can, of course, only be carried out by trial or error.

Referring again to the circuit diagram, it will be seen that one side of the filament is earthed through a condenser. Although not essential, it is frequently useful to tie the filament of the power amplifier to earth potential, as this is an aid to stability, and hence to general efficiency. Its value may be .1 mfd., and should be capable of withstanding high voltage in the event of a breakdown or short circuit elsewhere.

This concludes the first part of this article dealing with the construction and operation of a crystal controlled transmitter. It is intended to deal with modulation and keying system in the August issue, when details of a suitable power supply for operation from A.C. mains will be given.

STRAYS.

Will the pirate using G6NF's call and working local European stations please ask them not to QSL as G6NF cannot find time to answer all the cards!!

* * *

Mr. J. A. Cuthbertson (G5CU), Dunromyn, Cross Lane, Burniston Road, Scarborough, is willing to entertain a London member and his wife for a week during the summer in exchange for reciprocal entertainment during the R.M.A. Exhibition.

* * *

BERS147 (Mr. G. M. Manuell, R.F.A., Olna, c/o G.P.O., London) is desirous of obtaining a copy of the December, 1927, issue of Mullards' publication, "Radio for the Million." Can any member oblige him?

* * *

Mr. J. E. Cory (G5CY) proposes visiting Antwerp and Cologne during August and would like to hear from any member willing to accompany him.

STATION DESCRIPTION No. 33.

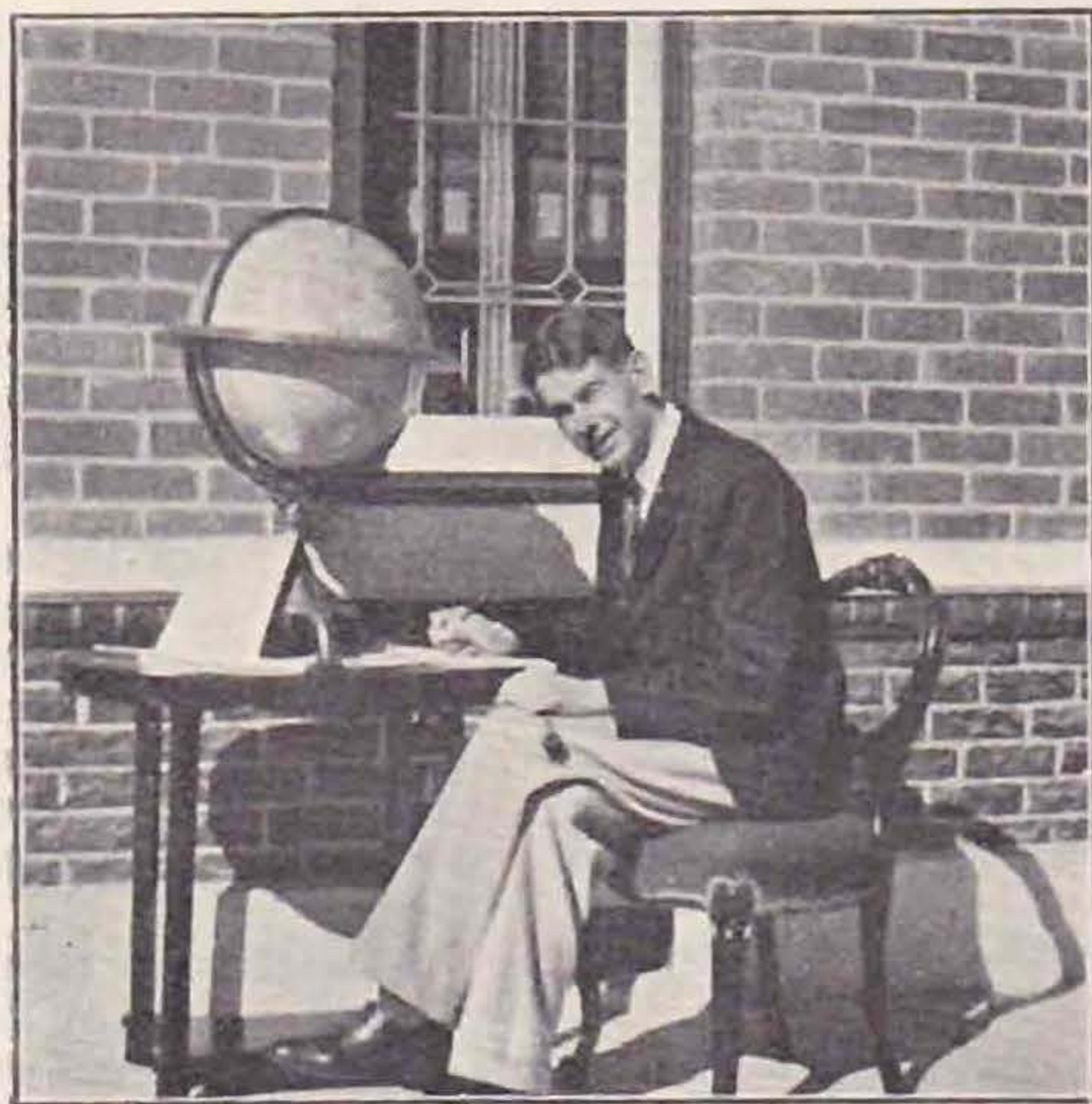
ZL4AI

The description of ZL4AI, which is reproduced here, represents, without doubt, the finest piece of work yet accomplished by the B.E.R.U. Empire Link Network.

As soon as it was known that Mr. G. G. Samson had a reasonable chance of being judged the winner of the Senior B.E.R.U. Contest, an urgent E.L.S. message was sent from Headquarters asking for a description of his station to be sent off in time for publication in this issue. Mr. Hunter (G2ZQ), a London E.L.S. who has been in daily contact with ZL4AO, immediately decided to attempt the task of copying the description via radio, with the result that within a few days of the request being made, the full story was in our hands.

We take this opportunity of congratulating Mr. J. Hunter and Mr. N. Shrimpton, the operator at ZL4AO, upon an achievement which will long be remembered.

ZL4AI first came on the air in 1926 when a 5-watt tube was used in a Hartley circuit: this was soon increased to two 5-watt tubes in parallel, and with this outfit a fair amount of DX was worked on the then 32-metre band. This transmitter used a Hartley circuit which employed a grid rejector circuit thereby controlling the



ZL4AI with the world at his finger tips.

frequency of the transmitter. In 1928 the power of the station was increased to 75 watts output at 2,000 volts, using one U.X.852 valve.

At the beginning of 1931, upon the return of ZL4AO from England, a joint transmitter was built up by ZL4AO and ZL4AI. The transmitter of this station consisted of two 75-watt tubes in push-pull in a T.P.T.G. circuit. This transmitter was used by ZL4AI in the B.E.R.U. tests of 1931 and 1932.

At the end of December, 1932, it was decided to make a "bird" of the B.E.R.U. tests, and since it was felt that greater success could have been

attained in the 1932 tests if a good signal had been obtained on 14 mc., crystal control was decided upon, with the added provision that equal power outputs should be obtained on both 7 and 14 mc.

With the valuable assistance of ZL4BT and ZL4AO the following transmitter was built up:—

A crystal oscillator working on 3.5 mc.; a frequency doubler; a 7½-watt amplifier; a 75-watt stage, which doubled for 14 mc., and was used as a neutralised amplifier on 7 mc.; followed by two 75-watt tubes in push-pull. The 75-watt stage was biased to work best as a doubler, and when used as an amplifier, with the same bias, the same output was obtained.

Since the same transmitter was used for both 7 and 14 mc., flexibility was necessary, and this was obtained by tuning both bands with the one coil and condenser in the 75-watt amplifier-doubler stage and using plug-in coils in the final push-pull stage, no reneutralising being required.

For power supply, the 75-watt tubes were supplied with 1,500 volts from mercury vapour rectifiers, no filter being used on the final stage. The frequency doubler stage and the 7½-watt stage were supplied from a 600-volt power supply and the crystal stage from a 250-volt supply, these two packs being also used for bias for the following stages.

The input to the final stage was 80 milliamps per tube at a nominal transformer voltage of 1,500, though the actual voltage was considerably less, due to poor regulation in the transformer, and particularly in the supply lines, the voltage on the 10-volt filaments dropping ¾ volt when the key was pressed.

The receiver at ZL4AI is an A.C. receiver consisting of a T.R.F. stage, S.G. detector, and one audio stage; the audio originally consisted of a pentode, but signal strength was too great for headphone work, and so a 227 has been substituted.

A fair amount of experimenting has been done at ZL4AI with different types of antenna systems. During the 1932 B.E.R.U. tests it was definitely proved that a full-wave 7 mc. zepp. was too directional for B.E.R.U. work. Hence a vertical antenna and counterpoise was used after the first

(Continued on page 390.)

THE B.E.R.U. CONTESTS—1933.

PLATITUDES seem hardly necessary in reporting the results of the Third Annual B.E.R.U. Contest. So many have contributed to its overwhelming success that to single out individuals would be unfair to the majority. Suffice it to say that this Contest will live longer in the memories of those who contested than any other. From the zero hour—midnight on February 3-4—enthusiasm and keenness prevailed. In all parts of the Empire that long-awaited hour was heralded in with such a crescendo of "BERU Calls" as has never before been heard. From then and right through the four week-ends of February, the air was alive with Empire stations sending their messages of eager anticipation across the oceans.

Sometimes we, who have the task of preparing the results of these Empire-wide Contests, long for the pen of a Merriman to record in less prosaic language our thoughts and our sentiments, but it is not to be, and, therefore, indulgence is claimed if this report reads more as a recital of facts than a pæn of splendid achievement.

The Senior Transmitting Contest.

Few foresaw when we agreed to sponsor the first Empire Contest in 1930 that in the short space of three years these Contests would rank amongst the greatest annual events in amateur radio circles. Our colleagues in the New Zealand Association of Radio Transmitters, who were the first to suggest an event of this kind, must feel intensely gratified that from such a small beginning so much success has accrued. It is appropriate now that one of their own amateurs, Mr. G. G. Samson, ZL4AI, should this year have the honour of being acclaimed the winner of the Senior Trophy, and on behalf of the whole membership, both at home and abroad, we offer him our sincerest congratulations. Mr. Samson is no newcomer to these Contests, as will be seen by reference to previous Contest Reports, for in both 1931 and 1932 he had the honour of leading for New Zealand. His success last year, when he occupied seventh place in the Empire, undoubtedly spurred him on to bigger honours, for on this occasion he amassed a total of 1,019 points, which figure was over 200 points in excess of his nearest rival. Well done, ZL4AI.

To Mr. Fred Miles, G5ML, present holder of the B.E.R.U. Challenge Trophy, goes the honour of holding second place, with a score of 741 points. Surpises have been an outstanding feature of this

Contest, for up to the middle of May we, in London, were under the impression that our Hong Kong colleagues, O'Brien, VS6AE, and Alvares, VS6AG, were runners-up to ZL4AI, and it was only after a careful examination of the entry forms that the Awards Committee were able to decide on the correct order of merit.

For three years a mighty effort has been made by the Hong Kong Amateur Transmitters Society to win through one of its members' stations the blue riband of Empire Amateur Radio, and in coming up from fifteenth to third place, Pat O'Brien has brought that ambition nearer. Mr. O'Brien's score, as recorded by himself, showed a total of 877 points, but unfortunately many of his distances were greatly over-estimated, with the result that his final score was reduced to 660 points.

Fourth place was deservedly won by Mr. J. Hunter, G2ZQ, with a score of 622 points. Mr. Hunter is a comparatively newcomer, but in the few years he has been on the air, achievements have been effected from his station which will rank high in the annals of Empire amateur communication.

Mr. Alvares, VS6AG, of Hong Kong, is placed fifth with a score of 603 points, but in a like manner to his colleague, VS6AE, his original score of 825 points was found to be incorrect.

Sixth place is held by Mr. S. A. Rance, YI2DS, of Basrah, who had the distinction of giving points to more British stations than any other entrant.

Seventh and eighth places are filled by two well-known Australian amateurs, Mr. Jack deCure, VK3WL, and Mr. Alex. MacKenzie, VK4GK, whose scores were separated by only two points.

Mr. J. S. Owner, G6XQ, and Mr. G. H. Todd, VS7GT, were placed ninth and tenth.

The Entries.

The very large total of 119 entries were received for the Senior Contest. Great Britain, with 54 entries, easily led the field, followed by Australia with 18, New Zealand with 17, South Africa with 7, India and Ceylon with 5, Iraq and Arabia with 4, Hong Kong with 4, Canada with 3, Kenya with 2, and Nigeria, Rhodesia, Egypt, Tanganyika, and Jamaica with 1 each.

The Leading Stations.

Thanks to the excellent work carried out by Mr. Shrimpton, ZL4AO, and Mr. Hunter, G2ZQ, we are able to include in this issue a full description of



The Senior B.E.R.U. Challenge Trophy with Replica.

Mr. Samson's winning station; therefore, further comment here is unnecessary. As a point of interest, ZL4AI effected no less than 75 contacts with British stations. His results during the second week-end were vastly superior to those obtained during the first, when only 223 points out of his gross total of 1,019 were scored. The 7 and 14 mc. bands were used to maximum advantage by ZL4AI, and all other leading stations, a rapid QSY being effected the moment conditions depreciated on one band, and improved on the other.

G5ML used an input of 500 watts on 7 mc., and 450 watts on 14 mc., whilst directional Zeppelin-fed aerials were employed in a similar manner to last year. Fifty-six Australasian contacts were made from his station, and all other parts of the Empire heard active were worked. The absence of VE4 and 5 stations was noticed by Mr. Miles and other British entrants.

VS6AE used an input of 150 watts from an RV218, which was fed by a 247 as CO, and a 210 as doubler. His aerial was a full wave Zeppelin. New Zealand, Australia, and Great Britain were his most fruitful spots for contacts, although in one short period during the afternoon (evening with him) of the last Sunday, three South Africans were worked on 14 mc. It should here be mentioned that Mr. O'Brien claimed 8 points for G, 7 points for ZL, and 5 points for VK contacts, whereas the correct figures should have been 5, 5, and 4 in most cases.

G2ZQ used an input of 140 watts on 7 mc., and 120 watts on 14 mc., and favoured a 14 mc. voltage-fed Hertz. Forty-nine VK and ZL stations were worked, as well as stations in most of the other parts of the Empire.

VS6AG used an input of 100 watts from a 247 CO, 247 buffer, and 203A PA. A full-wave Zeppelin aerial was in use. Compared with the results obtained by VS6AE, it was noticed that contacts with Africa were plentiful, 22 having been made during the first, and 24 during the second week-end. Only seven QSO's with G stations were effected.

YI2DS used an input of only 35 watts, which was obtained from two DET.1's in push-pull. No less than 97 contacts with Great Britain were established, whilst two QSO's were made with Canada.

VK3WL used an input of 48 watts from a UX247 CO, UX210 FD, and a T004/10 as PA. His aerial had a 66 ft. top, with 33 ft. feeders, and was series tuned on 7 mc., and paralleled tuned as an A.O.G. on 14 mc. Forty-eight contacts were made with G, and 23 with neighbouring VK's. A W.B.E. was won in six hours on February 11, the American contact being with VE2CA, the only Canadian station worked by him during the two week-ends.

VK4GK used an ultra-audion circuit with an input of 50 watts obtained from a DET.1 as PA during the first week-end, and a conventional CO FD FD PA arrangement during the second. A Windom aerial was employed. Thirty-two contacts were made with G, and 42 with ZL stations, whilst several good QSO's were effected with stations in

India and South Africa. No Canadians were worked.

G6XQ used an input of 135 watts on 7 mc., and 120 watts on 14 mc. A total of 42 contacts were made with Australasia. South Africa appeared to be a blind spot for his signals, as no contacts South of Nigeria (ZD2A) were effected. An interesting QSO with VE4FT is worthy of record.

VS7GT used UX210 valves throughout, which gave him an input of approximately 23 watts on both 7 and 14 mc. Mr. Todd underestimated his score by over 60 points, mainly through claiming only four instead of five points for the majority of his VK contacts. In his covering report, he mentioned that he was forced to abandon the Contest at 17.25 G.M.T. on the final day owing to bad static interference.

The Final Positions.

The positions of the first twenty stations are set out in Table I, whilst the remainder are shown below:

21, L. M. Mellars, ZL1AR, 346; 22, H. W. Hamblin, YI6HT, 319; 23, G. B. Ragless, VK5GR, 317; 23, G. Brown, G5BJ, 317; 25, W. G. Crawley, G5NP, 306; 26, R. H. Cunningham, VK3ML, 304; 27, E. J. Dunkley, VU2LZ, 301; *28, R. G. F. Blake, ZL3AJ, 273; *29, W. A. Wilson, ZL2CI, 257; 30, H. A. M. Whyte, G6WY, 239; 31, A. E. Livesey, G6LI, 237; *32, W. G. Collett, ZL4BP, 224; 33, E. H. Turner, VE2CA, 219; *34, F. S. Hannam, VK3BJ, 210; 35, C. S. Taylor, VE1BV, 201; *36, R. T. Stanton, ZL3AZ, 189; *37, T. A. Sargent, ZL1CE, 187; 38, M. Howden, VK3BQ, 178; 39, R. A. Bartlett, G6RB, 176; 40, R. H. Hammens, G2IG, 171; 41, A. W. Alliston, G5LA, 168; 42, G. C. Wilmot, ZD2A, 166; 43, W. E. Lane, VQ4CRH, 160; 44, J. Davies, G2OA, 157; 45, N. F. Ollivier, VK6FO, 154; 46, W. A. Clarke, G5FV, 151; 47, N. H. Aurret, ZU6W, 150; 48, J. W. Mathews, G6LL, 143; 49, W. B. Sydenham, G5SY, 142; *50, W. F. Self, ZL4CK, 140; 51, P. D. Walters, G5CV, 124; 52, J. J. Curnow, G6CW, 123; 53, G. A. Shoyer, ZS1H, 122; *54, W. Elder, VK3JE, 121; *54, F. R. Hawthorne, ZL1GX, 121; 56, J. D. Chisholm, G2CX, 120; 57, J. Wyllie, G5YG, 119; *58, W. P. C. Andrew, VE3WA, 110; 59, J. J. McMath, VK3JJ, 109; 60, A. Smith, G6VP, 104; 61, J. Lees, G2IO, 100; 62, N. I. Bower, VU2JT, 99; 63, A. D. Gay, G6NF, 96; 64, J. G. McIntosh, VU2LJ, 94; 65, W. A. Mead, G5YY, 93; 66, R. O. Davidson, VQ4CRL, 92; *67, F. M. Gray, VK5MU, 91; 68, O. Egenes, ZT5R, 85; 69, W. Heathcote, ZT6X, 84; 70, N. E. Huggett, G2PF, 82; 71, W. H. Cragg, YI6WG, 75; 72, S. A. French, G6FN, 71; 73, R. C. Neale, G6GZ, 66; 74, W. G. Manson, VQ3MSN, 65; 75, W. S. Pennell, ZS1Z, 62; 76, F. J. Finn, G6UF, 59; 76, C. H. Young, G2AK, 59; *76, A. S. Woolnough, VK3BW, 59; *79, J. Ramsden, ZL2JE, 53; *79, H. F. Yule, ZU5B, 53; 79, H. R. Carter, VK2HC, 53; 82, J. Barnes, VS6AD, 50; 82, L. W. Parry, G6PY, 50; 82, J. Clarricoats, G6CL, 50; 82, H. J. Powditch, G5VL, 50; 86, L. H. Thomas, G6QB, 49; 87, E. G. Ingram, G6IZ, 47; 88, R. Weeden, VK2PN, 46; *89, G. M. Salt, ZL1CK, 44; 89, E. J. Laker, G6LK, 44; 91, A. J. Mather,

In publishing the results of the Third B.E.R.U. Contest, Council takes this opportunity of thanking Mr. A. E. Livesey, G6LI, for checking the top 20 entries in both the Senior and Junior Contests. This presented endless difficulties and entailed the devotion of countless hours to the task.

TABLE 1.—SENIOR TRANSMITTING CONTEST.

| Position. | Name. | Call. | Power Used. | Points. |
|-----------|--------------------------|---------|-------------|---------|
| 1 | G. G. Samson | ZL4AI | 240 | 1,019 |
| 2 | F. W. Miles | G5ML | 450/500 | 741 |
| 3 | P. J. O'Brien | VS6AE | 150 | 660 |
| 4 | J. Hunter | G2ZQ | 120/140 | 622 |
| 5 | J. J. Alvares | VS6AG | 100 | 603 |
| 6 | S. A. Rance | YI2DS | 35 | 602 |
| 7 | J. E. DeCure | VK3WL | 48 | 548 |
| 8 | A. H. Mackenzie | VK4GK | 50 | 546 |
| 9 | J. S. Owner | G6XQ | 120/135 | 525 |
| 10 | G. H. Todd | VS7GT | 24 | 505 |
| 11 | O. G. Chapman | VK2OC | 80/200 | 500 |
| 12 | G. Pollock | VK2XU | 25 | 485 |
| 13 | { D. L. Martin } | { VU2AH | { 40/75 | { 481 |
| | { T. C. Pratley } | | | |
| 14 | H. D. Price | G6HP | 250 | 468 |
| 15 | E. A. Dedman | G2NH | 125 | 431 |
| 15 | E. S. Cole | SU1EC | 50/60 | 431 |
| 17 | S. U. Grimmett | VK2ZW | 25 | 393 |
| *18 | V. E. Marshall | VK3UK | 80 | 390 |
| 19 | J. A. Faithful | VU1AA | 55 | 368 |
| 20 | G. Merriman | VS6AH | 80 | 365 |

* Non-Member, B.E.R.U.

TABLE 2.—JUNIOR TRANSMITTING CONTEST.

| Position. | Name. | Call. | Power Used. | Points. |
|-----------|-------------------------|--------|-------------|---------|
| 1 | G. H. Todd | VS7GT | 24.5 | 480 |
| 2 | F. E. Groom | YI6BZ | 24.2 | 442 |
| 3 | E. J. Dunkley | VU2LZ | 24.5 | 297 |
| *4 | J. C. Callendar | ZL4BT | 24 | 250 |
| 5 | P. J. O'Brien | VS6AE | 25 | 249 |
| 6 | H. W. Hamblin | YI6HT | 20 | 198 |
| 7 | J. S. Owner | G6XQ | 25 | 185 |
| 8 | A. H. Mackenzie | VK4GK | 24 | 161 |
| *9 | P. Levenspiel | VK2TX | 25 | 153 |
| 10 | L. H. Thomas | G6QB | 25 | 116 |
| *11 | H. B. Wilson | VK5WB | 24 | 112 |
| 12 | F. W. Miles | G5ML | 25 | 110 |
| *12 | W. G. Collett | ZL4BP | 24.5 | 110 |
| *14 | W. A. Wilson | ZL2CI | 24 | 100 |
| 15 | J. Clarricoats | G6CL | 25 | 97 |
| 16 | W. E. Lane | VQ4CRH | 25 | 95 |
| 17 | G. C. Wilmot | ZD2A | 23 | 87 |
| 18 | J. E. deCure | VK3WL | 24 | 85 |
| *19 | J. Nobes... .. | ZL1CB | 8 | 77 |
| *20 | G. M. Salt | ZL1CK | 24 | 72 |
| *20 | W. A. W. Stevens | ZL2HR | 21.5 | 72 |

* Non-Members, B.E.R.U.

TABLE 3.—RECEIVING CONTEST.

| Position. | Name. | Call Sign. | Points. |
|-----------|--------------------------|------------|---------|
| 1 | E. N. Adcock | 2BLG | 1,738 |
| 2 | T. F. Gleed | BRS689 | 1,099 |
| 3 | A. T. Mathews | BRS497 | 853 |
| 4 | G. W. Horton | BERS74 | 809 |
| 5 | J. G. Stonestreet | 2BUW | 770 |

VK2JZ, 43; 92, W. H. I. Stephens, VP5IS, 39; 92, J. W. Mavis, ZE1JE, 39; 94, J. F. Lategan, ZS4U, 36; 95, G. W. Thomas, G5YK, 34; 95, H. and L. Wilkins, G6WN, 34; 96, G. W. Wigglesworth, G2BH, 32; 97, A. N. J. Ley, G5DM, 31; 97, C. W. Parton, ZL3CP, 31; 99, J. A. Philpot, G5PL, 26; 99, E. Whiteley, ZL1FW, 26; 101, G. C. Price, G2OP, 24; 102, R. J. Denny, G6NK, 21; 102, T. P. Allen, G6YW, 21; 104, A. O. Milne, G2MI, 19; 105, A. T. Boshier, ZT6J, 18; 106, E. R. Martin, G6MN, 17; *107, W. A. W. Stevens, ZL3HR, 16; 107, R. Barnes, G6DS, 16; 109, J. N. Smith, G5QX, 14; 110, T. Woodcock, G6OO, 11; 111, H. C. Turner, G5OJ, 8; 111, R. D. L. Dutton, G6QQ, 8; 113, R. A. Hiscocks, G6LM, 6; 114, L. A. Moxon, G6XN, 3; 115, E. R. Radford, G2IM, 2; 115, J. Tovell, G5LQ, 2; 115, C. L. Ward, G5NF, 2. *Non-Member, B.E.R.U.

It is regretted that owing to the late arrival of entries from Mr. J. B. Elliott, ZL3CC (120 points), and Mrs. Peggy Cameron, ZL4CL (29 points), it was not possible to include them in the above list.

Award Winners.

In accordance with the rules, Certificates of Merit will be awarded to Messrs. Samson, Miles and O'Brien, the three leading stations in the Contest.

Awards will also be made to Messrs. S. A. Rance (Iraq and Arabia), J. E. deCure (Australia), G. H. Todd (Ceylon and South India), D. L. Martin and T. C. Pratley (North India and Burma), E. S. Cole (North, West and East Africa), E. H. Turner (Canada), and N. H. Auret (South Africa).

General Comments.

Space does not permit us to record at any great length the many comments and suggestions which were made by the entrants, but an attempt will be made to paraphrase the more important remarks of interest.

G2ZQ suggests that future contests be arranged for alternate week-ends; he further considers that the same station should not be worked more than once on each band during each contest. Code words should be exchanged, and more frequent use made of the QRZ signal. He criticised those stations who sent prolonged test calls without signing.

VK3WL reported conditions as being excellent during the first week-end, and moderately good during the second. The Junior Contest periods, however, were distinctly bad. He considered the scoring system good, and an improvement over previous methods. G6QW was the strongest G heard on 7 mc., and G6XQ the strongest on 14 mc. G5ML was the easiest DX station to read.

VK4GK was troubled with local power QRM; he comments on operating procedure as follows: "In some instances stations were in a desperate hurry after they had received their reports, and were inclined to lose patience if they were asked for a repeat. The shrewd operator wasted little or no time on trivialities, but got his report checked quickly and lively. . . . The Contest is certainly the event of the year, and is becoming more popular than its originators even anticipated, but I would like to see more Canadians interested. . . . I must express my pride in the high quality of Empire amateur signals generally, but the G's in particular."

VS7GT found conditions during the Contest the poorest he had experienced for a very long time; static rose to R9 at times, and was rarely less than

R6. . . . "This test was more one of endurance than of operating skill . . . and yet was enjoyed in the fullest measure."

VK2OC was also bothered by power leaks from a local 33,000 v. H.T. line.

SU1EC was unable to take part in the Junior Contest, but operated his station during the first week-end in order to give points to others taking part in that event. He forwarded a very valuable check log. He comments on the Senior as follows: "Enjoyed every second of the Contest, though I wish I could have been a Jekyll and Hyde so that I could have carried out the Contest on one hand—slept, eaten and worked on the other."

ZL1AR, after fruitless attempts to raise Canada, decided to change the direction of his aerial by attaching it to a neighbour's house. His first contact with the new system was with VE2CA, who is resident only a few miles from the old home of Mr. Mellor's neighbour, who had given him permission to erect the aerial on his property!

VU2LZ forwarded detailed information regarding his station, which we hope to publish as a station description in a future issue. As a point of interest, VU2LZ mentioned that he had no intention of entering for the Senior Contest, but on the opening day he started up his station as usual for local schedules, but before he knew what had happened, he was in the thick of the fray. He concluded a most interesting report by saying: "The tests brought in a great deal of fun, and are probably looked forward to by Empire stations as the most important event in their transmitting lives during the year."

VE2CA, as in previous years, sent a detailed account of Contest conditions noted at his station. He lamented the fact that a large number of ZL and VK stations were heard calling "CQ DX," and working non-Empire stations.

VE1BV was off the air for 18 hours during the Contest because his power supply leads were brought down in a severe sleet storm. He had the distinction of winning a W.B.E. during the Contest.

ZL3AZ said that he did not know there were so many G's on the air until the Contest took place! He mentioned that the ZL amateurs who took part in the Contest had a great time, and are looking forward to the next event.

VK3BQ sums up his views in a short paragraph, "Splendid Contest. Most enjoyable. Wish I could have spared more time to do it justice."

VQ4CRH forwarded an excellent description of his station, which has already appeared in this journal. G5ML was the most consistent station heard by him during the Contest, but no VE's were heard at any time.

G2OA commented on the good quality signals of the majority of Empire stations.

VK6FO was unfortunately unable to continue the Contest during the second week-end as a result of a serious blow-up. His total of 154 points, therefore, represents only one week-end's activity.

ZU6W considered the present method of scoring to be as fair as possible. He, together with other South African stations, complied strictly to the Contest rule that licensed power should not be exceeded.

VE3WA knew nothing about the tests until the opening day, a condition we hope to remedy in future years.

ZT5R forwarded a complete copy of his log for the Contest, showing all stations heard during that period. He comments on the consistency of signals from G6FN, who was heard right through the morning of February 4. He noted a batch of G stations around 18.00 G.M.T., February 5, but he was unable to effect a contact. These included G6LI, and G6UF. His log should prove useful to those members studying wave propagation.

VQ3MSN mentioned that cloudy and thundery weather prevailed during both week-ends. G stations were conspicuous by their absence, and the only one worked, G5BJ, was extremely weak.

G6UF reiterates the remarks made by G2ZQ, and suggests that in future stations should give their own call sign more frequently. During the Contest he listened to many weak stations calling "Test" for two or three minutes without signing, only to find that they were ground wave signals from stations in his own country.

G2AK considered the method of calculating the distances and points to be unnecessarily complicated.

The most consistent station heard at ZL2JE was G5ML. His station is badly screened by hills and the steel towers of a local broadcasting station. ZL2JE would appreciate reports from any stations west of New Zealand. He suggests that in future Contests only one award should be given, and that to the winning station.

VP5IS, who was the sole representative from the British West Indies, lamented on the lack of support shown by Canadian and other West Indian stations. Many Australians were heard by him between 11.00 and 12.30 G.M.T. each week-end, but unfortunately no contacts were made. In every case the VK's were heard calling CQ, with the result that their calls were answered by W stations, whereas if "Test B.E.R.U." had been sent, the W's would probably have ignored the calls. He suggests that in future contests all Empire stations should send "Test B.E.R.U." instead of "CQ."

ZE1JF submitted the first Southern Rhodesian log in these Contests. VK, VS3, and VE stations were conspicuous by their absence, but two weeks prior to the Contest, VK2 and VS3 signals were heard daily. The most consistent station heard was VS6AG.

The rainy season in South Africa, bringing with it heavy static, was responsible for the rather low score of ZS4U. VS6AG was worked with an amount of 4 watts.

The Junior Transmitting Contest.

To meet the wishes of a large number of members, both at home and abroad, who have not facilities for operating high power stations, it was decided this year to stage a Junior Transmitting Contest, limited to stations using an input power of not more than 25 watts. The support given to this Contest has been most gratifying, and although conditions during the second week-end were not quite as good as those prevailing during the Senior and first week-end of the Junior, excellent results were obtained by stations in most parts of the Empire.

The winner of the event is Mr. G. H. Todd, VS7GT, of Ceylon, with a score of 480 points. Mr. Todd has been one of the leading stations in the two previous Contests, and therefore it was no surprise to discover him in the van of this Contest.

In finishing second last year to G5ML, with a score of over 3,000 points, it was apparent that Mr. Todd possessed a highly efficient station, especially as his power then did not exceed 25 watts.

The runner-up is Mr. F. E. Groom, YI6BZ, of Basrah, another well-known Empire station, with a score of 442 points.

Third place was won for India by Mr. E. J. Dunkley, VU2LZ, with a score of 297 points, whilst New Zealand obtained fourth place through Mr. Callendar, ZL4BT, with a score of 250 points.

Mr. O'Brien, VS6AE, finished only one point behind ZL4BT, whilst the sixth place was taken by another Iraq station, Mr. H. W. Hamblin, YI6HT.

Mr. J. S. Owner, G6XQ, 185 points, Mr. A. MacKenzie, VK4GK, 161 points, Mr. Levenspiel, VK2TX 153 points, and Mr. L. H. Thomas, G6QB, 116 points, finished seventh, eighth, ninth, and tenth respectively.

The Entries.

A total of 83 entries were received from the following countries: Great Britain, 44; New Zealand, 9; Australia, 8; South Africa, 6; India and Ceylon, 5; Iraq, 2; Hong Kong, 1; Canada, 1; North, East and West Africa, 7.

The Leading Stations.

The transmitter used by VS7GT for the Junior Contest was exactly similar to that employed in the Senior, and the input at no time exceeded 25.4 watts. A description of Mr. Todd's station appeared recently in this journal.

The Awards Committee found, in checking Mr. Todd's entry, that he had under-estimated his original score of 406 points by 74 points, due, in the main, to the fact that four points only had been claimed for Australian contacts. During the Contest 116 contacts were established with practically every part of the Empire; the majority of his QSO's being with G and VK.

YI6BZ used an input of 24 watts, his transmitter consisting of CO, FD, and two DET.1s in push-pull as power amplifier. DE5B valves were used for the first two stages. A Zeppelin aerial with 130 ft. roof was employed for the duration of the Contest.

VU2LZ used an input of 24.5 watts from a push-pull self-excited oscillator using two Phillips TCO4/10 valves. The aerial was a half-wave Zeppelin. A total of 68 contacts were made with most parts of the Empire, the majority being with VK and South African stations. Only 5 G's were worked.

No details are given by ZL4BT regarding the transmitter he used, but his input to the last valve was 24 watts. The aerial was 33 ft. vertical and 33 ft. counterpoise. The majority of his contacts were with Australia and Great Britain.

VS6AE used an input of 25 watts, and had a total of 58 contacts, the majority of which were with VK and ZL.

YI6HT had 96 contacts, 81 of which were with British stations. An input of 20 watts to a half-wave 14 mc. aerial was used.

G6XQ used an input of 25 watts to a voltage-fed Hertz, with 66ft. 3 in. top and 51 ft. feeders. He had 29 contacts, 13 of which were with VK or ZL stations.

VK4GK, with an input of 24 watts, worked 60 stations, including seven G's. He was out of action

for four hours on the 26th owing to a severe thunder-storm.

VK2TX had 66 contacts, most of which were with New Zealand. Four QSO's were made with G.

G6QB used an input of 25 watts to an end-fed Hertz, 66 ft. long, and employed a single valve Schnell receiver. He had 25 contacts, five of which were with VK and ZL.

The Final Positions.

The final positions of the first twenty stations are set out in Table 1, whilst the remainder are shown below :

22, R. O. Davidson, VQ4CRL, 71 ; 23, J. Davies, G2OA, 70 ; *24, T. F. Emeny, VK3GQ, 66 ; *25, W. F. Self, ZL4CK, 59 ; 26, G. Ragless, VK5GR, 57 ; 26, E. A. Dedman, G2NH, 57 ; 28, W. S. Pennell, ZS1Z, 54 ; 28, J. W. Mathews, G6LL, 54 ; *30, J. W. Ramsden, ZL2JE, 53 ; 31, M. Howden, VK3BQ, 50 ; 32, G. Edwards, G2UX, 47 ; 33, C. W. Parton, ZL3CP, 46 ; 34, Miss N. Corry, G2YL, 45 ; 35, D. L. Martin and T. C. Pratley, VU2AH, 44 ; 35, V. de Robillard, V8AF, 44 ; 37, E. G. Ingram, G6IZ, 40 ; 37, A. G. Lapworth, G6DL, 40 ; 39, O. Egenes, ZS5L, 37 ; 40, R. C. Barnes, G6DS, 34 ; 41, L. A. Moxon, G6XN, 33 ; *42, W. Elder, VK3JE, 32 ; *43, W. H. Tittley, ZT5V, 30 ; 43, R. A. Bartlett, G6RB, 30 ; *45, A. B. Walker, ZT5Q, 29 ; 45, H. and L. Wilkins, G6WN, 29 ; 47, E. J. Laker, G6LK, 28 ; 48, J. H. Hargreaves, G5VO, 27 ; 49, G. H. Jolliffe, VS7GJ, 26 ; 50, W. H. Heathcote, ZT6X, 25 ; 51, H. C. Turner, G5OJ, 24 ; 52, L. W. Parry, G6PY, 23 ; 53, B. M. Orr, VQ2XD, 22 ; 54, J. N. Smith, G5QX, 21 ; *55, H. F. Yule, ZU5B, 20 ; 55, G. R. Kent, ZT6R, 20 ; 57, W. B. Gilhespy, G6GS, 17 ; 58, A. N. Le Cheminant, G6AC, 13 ; 59, C. L. Ward, G5NF, 12 ; 59, G. E. King, ZE1JF, 12 ; 59, S. Buckingham, G5QF, 12 ; 59, G. C. Price, G2OP, 12 ; 63, A. E. Watts, G6UN, 9 ; 64, R. A. Hiscocks, G6LM, 8 ; 64, S. A. Taylor, G5TL, 8 ; 64, T. C. Platt, G2CA, 8 ; 67, G. W. Wigglesworth, G2BH, 7 ; 68, J. Tovell, G5LQ, 6 ; 68, E. R. Radford, G2IM, 6 ; 68, R. F. Hilton, G6QK, 6 ; 68, E. H. Turner, VE2CA, 6 ; 68, J. K. Haynes, G6YH, 6 ; 73, J. H. Goodliffe, G6LF, 5 ; 74, J. P. Stove, G5ZX, 4 ; 74, R. G. Norman, G5DP, 4 ; 74, W. P. Jones, G2PA, 4 ; 74, H. C. Hall, G2RU, 4 ; 78, C. S. Anderson, G6BC, 3 ; 78, R. Barr, G15UR, 3 ; 80, M. Buckwell, G5UK, 2 ; 80, T. H. Beaumont, VU2FP, 2 ; 80, R. Y. Parry, G5XV, 2 ; 80, J. D. Pinchbeck, G5DF, 2. *Non-member, B.E.R.U.

Award Winners.

In accordance with the rules, Certificates of Merit will be awarded to Messrs. Todd, Groom, and Dunkley, the three leading stations in the Contest.

Special awards will be made to Messrs. J. C. Callendar (New Zealand), P. J. O'Brien (Hong Kong), J. S. Owner (Great Britain), A. H. MacKenzie (Australia), W. E. Lane (North, West and East Africa), W. S. Pennell (South Africa).

General Comments.

Interesting comments regarding conditions were made by ZL4BP, ZS1Z, V8AF, ZS5L, VQ2XD, and G5QX, but lack of space forbids publication. We take this opportunity, however, of thanking the above members and all others who gave us their views on the Junior Contest.

The Receiving Contest.

Whilst the support given to the Receiving Contest was a little below expectations, it is pleasing to report that many of the entrants produced carefully prepared logs which were found of great use in checking the transmitting returns.

When the rules for the Contest were drawn up, no decision had been reached regarding the type of award to be made to the leading station, but, as a result of a generous offer made by Capt. G. C. Wilmot, ZD2A, Council are now in a position to present a Challenge Trophy to the winner of this and future Receiving Contests.

Congratulations are due to Mr. E. N. Adcock, of Birmingham, for his achievement in leading the field with a score of 1,738 points. His success gives the Birmingham District of England three leading awards in the Contest, Mr. F. W. Miles, of Coventry, having been judged the leading British station in the Senior, and Mr. J. S. Owner, of Birmingham, the leading British station in the Junior Contest. At the time of the Contest, Mr. Adcock was operating under the Artificial Aerial, 2BLG, but has recently been fully licensed as G2DV.

Second place was won by Mr. T. F. Gleed, BRS689, of Bristol, with a score of 1,099 points. He was followed by Mr. A. T. Mathews, BRS497, of Finchley, London, with a score of 853 points. It will be remembered that Mr. Mathews was the leading station in last year's Receiving Contest.

Fourth place was won for India by Mr. G. W. Horton, BERS74, of Quetta, with a score of 809 points, whilst Mr. J. G. Stonestreet, 2BUW, of Canterbury, Kent, with a score of 770 points, was placed fifth.

The Entries.

A total of 24 entries were received, 19 of which were from British stations, three were from India, one from Australia, and one from South Africa.

The Leading Stations.

Mr. Adcock's receiver consisted of a screened grid detector, with a band pass L.F. filter designed to peak signals between 400 and 900 cycles. An inverted L 55 ft. high, and a 20-metre doublet aerial were used. Signals were intercepted from every part of the world, and over 200 Empire stations logged.

Mr. Gleed used a Schnell type of receiver with a full band spread on all bands. A 66 ft. A.O.G. aerial was employed. A noticeable feature of Mr. Gleed's entry was the large number of Canadian stations heard ; it is regretted that so few of them took part in the Contest.

Mr. Mathews used a conventional Reinartz O-v-1 with 100 ft. A.O.G. aerial ; Mr. Mathews' score would have been considerably higher if points had been allowed for Empire stations calling non-Empire stations.

Mr. Horton used an O-v-2 receiver, and an aerial 80 ft. long, 20 ft. high ; a very large number of G stations were heard, and we believe Mr. Horton has sent an individual QSL to each one. Points were claimed from 235 stations heard.

Mr. Stonestreet used a modified Reinartz receiver and a 33 ft. indoor aerial.

The Final Positions.

The positions of the first five stations are set out in Table 3, whilst the remainder are shown below :

6, C. E. Jefferies, BRS589, 763 ; 7, C. A. Brad-

bury, BRS1066, 727; 8, A. A. Hammond, BRS918, 717; 9, R. A. Evenett, BERS79, 620; 10, D. E. White, BERS112, 414; 11, G. P. Anderson, BRS536, 409; 12, A. Maxwell, BRS964, 382; 13, W. F. Miller, BRS899, 323; 14, A. H. Brown, BRS865, 303; 15, G. A. H. Eckles, BRS728, 272; 16, G. Wells, BRS624, 268; 17, S. F. Sharpe, BERS14, 255; 18, P. Seymour, BRS475, 238; 19, J. Haigh, BRS948, 210; 20, T. Martin, 2BHM, 177; 21, N. Blackburn, 2BMX, 166; 22, J. W. Hamilton, 2ASX, 147; *23, N. J. Philip, SARS2AC, 81; 24, K. T. Harvey, 2AAU, 20. * Non-member, B.E.R.U.

Award Winners.

Certificates of Merit will be awarded to Messrs. Adcock, Gleed and Mathews, whilst a special award will be made to Mr. Horton.

General Comments.

Useful suggestions for future Contests, and information regarding conditions were received from

2BLG, BRS689, BERS74, BRS589, BRS918, BERS79, BERS112, BRS536, BRS624, BERS14, BRS475, and 2ASX, but, unfortunately, space does not permit publication.

Check Logs.

Useful check logs were submitted by G2DH, G2HJ, G6KI, G6OY, G6WY, G6XJ, G6ZR, VK2NR, VK3LQ, VK3RJ, VK5WR, VK7CH, VU2JP, ZL1FQ, SU1EC, ZS1AA, ZT2H, ZU5R, VP4AA, VE5HS, W1BHM, VO8AW, BERS116, BERS120, and DE0867.

Final Remarks.

Little else now remains to be said, except that we take this opportunity of again thanking all who contributed to the success of the Contest, and especially would we like to express our appreciation to our B.E.R.U. Representatives, and to the Editors of contemporary journals for the valuable publicity which they so generously gave to the Society.

ZL4AI—Continued from page 383.

week-end. This arrangement, while excellent for 7 mc., was not a great success for 14 mc. This year an attempt was made to find a system which would be excellent on 14 mc. and work passably well on 7 mc. The final choice consisted of a half-wave vertical and a half-wave horizontal for 14 mc., each section being coupled directly to opposite ends of the antenna tank circuit. The antenna tank circuit had as high an L/C ratio as possible and consisted of two 6-turn antenna coils tuned with a capacity of about 10 mfd. For 7 mc. a condenser of 500 mfd. was placed in series with the antenna coils, the whole arrangement then working as an antenna counterpoise arrangement. The system is even better if fed by two 7 mc. half-wave feeders, as then it may be suspended well clear of surrounding objects. On 14 mc. the results exceeded all expectations, SU1EC being the only station heard and not worked on this band, and on both week-ends reports of R9 were obtained from Hong-Kong from two different stations. The reason advanced for the success of this type of system is that equal amounts of radiation take place on a high angle and on a low angle, hence power is sure to be radiated at the best angle for each different locality. Good results were also obtained on 7 mc. with this system, but reports of only R6 were obtained from Hong-Kong on this wave.

Station ZL4AI has been on the air the last few years during January and February only since the owner has been studying engineering at Canterbury University College and is only home for vacations, which luckily coincide with the B.E.R.U. tests. The address of the station has been changed quite frequently, and the call-signs of 3XA and ZL3AM were used when a transmitter was installed at the Varsity.

For the last two B.E.R.U. tests the station has been transported to ZL4AI's seaside cottage, which is in one of the best spots in New Zealand for radio reception, especially of English stations, and is also free from local QRM and power leaks.

Since the tests the outfit has been dismantled, and ZL4AI is again rebuilding, the power supply being converted to a six-phase rectifier from which practically pure D.C. will be obtained with no filter. The new transmitter will retain the push-pull output stage but will probably use a harmonic crystal oscillator, with which experiments are now being conducted.

The Month on the Air—Continued from next page.

but if you are appointed to a committee, don't attend any of its meetings.

7. If the President asks your advice on some particular point, say that you know nothing about it; but when the matter comes up at a subsequent meeting, don't fail to tell everyone how it should be settled.
8. Don't do anything more than is strictly necessary; when other members roll up their shirt-sleeves and place their knowledge at the disposal of the society, tell everyone that it is controlled by fools.
9. Always be behind with your subscription.
10. Don't bother to introduce any new members; leave that to "George."

Strays.

Mr. L. J. Martin, Honorary Secretary, Lensbury Radio Society, advises us that the licensed call issued to his Society, G2IH, has recently been pirated on the 1.7 mc. band. He will be glad to have any information regarding these illegal transmissions.

* * *

The portable 56 mc. station of G5UK is now operating, and Mr. Buckwell will appreciate reports.

* * *

Mr. C. Hewins, G2QH, asks us to announce that he has recently obtained the diploma of the British Radio Institute.

THE MONTH ON THE AIR.

BY UNCLE TOM.

(Our leg-puller-in-chief emerges once more from his "bad location" to tell those people with punk receivers where they get off.)

WELL, well, well! Little did I think that I should catch so many fish with such a small fly! One little word about the prevalence of punk receivers and nearly everyone who owns one writes to me to tell me that it's a good one!

Seriously, though, I did think that readers of the "BULL." would know by now that I don't always mean *quite* 100 per cent. of what I say: 99, perhaps, but not always the 100. Let us deal with some of them.

"One of the Nephews," in last month's "BULL.," says that my "provocative statement" must be made "simply to draw the fire of we (*sic*) more modest members . . ." etc. As a matter of fact his intentions are better than his grammar, but, even then, he's got me all wrong. First of all—a man who finds difficulty in receiving certain parts of the world well, but gets quite a lot from the other parts, hasn't got what I should call a bad location. By the term "bad location" I understand a place where *nothing* is up to standard. That is the type of bad location which is explained by a punk receiver *every time*.

"One of the Nephews" obligingly helps me to prove my point by reminding me that I wrote to him, many years ago, about my own "bad location." Well, *that* one was explained by a punk receiver, if ever one was! But, whereas I appear to have grown up and learnt better sense, some of the others haven't.

I might say that I am now living in a bad location for Australia. I certainly am, but I make up for it by receiving South America and the west coast of North America 100 per cent. better than the fellows who get the Aussies so well. Do I grumble? No! As for this same gentleman's remarks about my views on receivers, which have undergone a change, I would ask him this: Which is better—to change one's views and admit that one was wrong, or to hang on the same old idea like a narrow-minded old bone-head? I hope I have the courage to admit that my views have changed.

Mr. Kirlew, of G6KW, wants me to write a serious article on the vexed question of reception. Right, KW—this shall be done forthwith.

Another feller, signing himself "Punk Lid," which probably means that he isn't one, points out that he couldn't hear B.E.R.U. stations in February, but had no difficulty in hearing the Yanks in March. He quotes this to show (presumably) that his location is no good for B.E.R.U. I don't agree. I find it a hundred times easier to receive all the scores of Yanks than to log half a dozen B.E.R.U. stations, and every ham I have spoken to agrees with me.

Just to leave a loophole, let me amend my remark in the April issue to read thuswise: "Bad location" is the ham translation of "punk receiver" ninety-nine times out of a hundred. There, there—you can all imagine that you're the hundredth ones, now!

W6QX tells me that he, for one, thinks organised tests are definitely detrimental to the spirit of amateur radio.

He goes for G6JX about his letter on low-power, though, and I must say that my sympathies are with W6QX about it. He says that a poorly-adjusted low-power transmitter can cause worse interference than a well-adjusted high-power transmitter; and that by the time a man has learnt to handle low-power gear properly, he is well qualified to use more watts without making a nuisance of himself.

A long letter from G6RB reached me just too late for last month's issue. He reports plenty of fun during the 3.5 mc. tests, except for QRM from Continental "spitch." He proceeds to have a whack at the man who thinks that, by calling "Test" 50 times without signing, he has a better chance of being reported or heard; he noted some of them during the 3.5 tests. But a worse variety of idiot, he thinks, is the man who calls "Test" six times and proceeds to adjust his transmitter without signing.

At the time of writing he reports stony silence on 14 mc. in the early mornings. By the time this appears the band ought to be full of W6, W7, K6, K7, VK and ZL stations. I wonder!

G2ZC also talks about 3.5 mc. and marvels at the slackness of British hams in not making more use of it for fairly short-distance QSO's. As he says, "If it's DX, go where you like, but if it's to be a QSA 5 affair, even with a weak QRK, the 3.5 or 1.7 bands are the place."

A curt little note on a postcard, headed "Optimism in Excelsis," asks whether anyone heard G2IG signing "Test BERU" on 56 mc. during a recent Field Day? I believe G6QB was doing something of the sort in the "Glasshouse" tests.

News from the North is scarce, but my one regular correspondent says that Central America and the West Indies have been phenomenally good lately, together with VU and J, earlier in the evening.

Finally, here is an excellent sermon, forwarded by G6FY from a Mexican short-wave paper.

"How to Run a Society."

1. Don't attend any meetings.
2. If you *do* attend, arrive late.
3. If you don't like the weather, don't even think of attending.
4. If you are present at a meeting, try to find fault with the Council and all the other members present.
5. Never accept any office—it's much easier to criticise than to work.
6. Nevertheless, show your disappointment if you aren't selected to serve on some committee;

(Continued foot of col. 2 previous page.)

THE 56 MC. TESTS.

At the Crystal Palace.

BY L. H. THOMAS (G6QB).

It is with considerable pleasure that we publish Mr. Thomas' own version of the Crystal Palace 56 mc. Tests, because we, in common with many others, have been compelled to content ourselves with reading journalistic accounts, many of which gave no indication that the work was carried out by our members.

Our congratulations are extended to Messrs. Thomas, Gay and Price for their initiative, and to all others who assisted them in the tests.

The full story of the Crystal Palace Tests would not, however, be complete without Mr. Douglas Walters' personal account of the work carried out by him in an aeroplane chartered for the occasion by the Editor of the "Daily Herald."

The reception of 56 mc. signals, 130 miles from the Crystal Palace is a British record, but one which we anticipate will shortly be broken again if the plans Messrs. Walters and Thomas have in mind mature.

The need for whole-hearted co-operation has seldom been so imperative.

THANKS to the phenomenal amount of publicity given to our 56 mc. tests from the Crystal Palace by the daily Press, everyone knows a good deal about it by now. It remains only for me, one of the "ops," to tell the true story, devoid of frills and journalese, of what we did on that day, and how we did it.

Being connected with the C.P. myself, I had little difficulty in persuading the management to lend me the North Tower one Sunday, providing that no damage was done and that not too many watts were consumed from the mains. This first step being settled, G6NF, G5IS, G6HP and myself had a little conference, at which we agreed to rig up a transmitter and receiver on the Tower, and to arrange for several local amateurs to go out in cars listening for us. G5IS volunteered for this job, together with G5AW, and HP, NF and myself decided to go aloft for the day.

Transmitters were discussed, and as G6NF had done considerably more 56 mc. work than I had, and as I suspected that his TX was better than my own, it was agreed to use his 56 mc. gear almost as it stood at the home station.

I cannot make it too clear that the whole of the transmitting gear—with the exception of a big transformer belonging to Mr. Price, and a mike belonging to myself, was Mr. Gay's. G6NF really deserves all the credit for the transmitting side of the affair. All that I did myself was to make the preliminary arrangements for fixing up the gear, provide an aerial and a receiver, and act as one of the operators.

As the licence was in my name, the call used had to be G6QB, and this has resulted in all the credit due to NF having been passed on to myself. Let me take this opportunity of passing it back to the rightful owner!

On Saturday, May 20, the three of us might have been seen in an extraordinarily grimy state, loading up a somewhat ancient lift with gear. A detailed

description of what went into that lift will cover the entire station.

The 56 mc. transmitter used two B.12's in the usual push-pull TP-RG circuit; the modulator used two 211-E's in parallel, and the mike was fed directly into the grid circuit through a high-ratio modulation transformer with no further amplification. The 1,000-cycle tone was generated by a small oscillator run from a 100-volt H.T. battery.

The plate supply for the transmitter was derived from a 400-volt eliminator. So keen was NF on obtaining full modulation, however, that the voltage on the oscillator itself was dropped to about 170; so that with this voltage at 60 mA the input was the merest fraction over 10 watts. This may serve to correct the general impression that we were using high power.

The aerial was a 2½-metre length of petrol piping, hanging vertically from a stand-off insulator on the end of a nine-foot length of battening which was poked out fishing-rod fashion from the gallery of the tower. Actually it was only four feet out from the edge, since we used four-foot feeders.

Two receivers were taken up—Mr. Gay's and my own. Both were supers, the differences being that mine used a split Colpitt circuit and had no L.F. and that NF's was of the conventional Schnell-cum-Reinartz type with an optional note-mag.

Independent L.T. and H.T. supplies were used for the receivers so that they could be used together on opposite sides of the tower. This was found to be very useful, and some interesting results were obtained in this way.

So much for the gear. On the Sunday the three of us ascended the 400 stairs soon after 9 a.m., ready for work. The preliminary tests had been done on Saturday night, after which the gear was covered over with a ground-sheet.

With the aerial pointing North-West, we started up at about 9.40 on Sunday morning, and had an immediate QSO with G5VY of Tottenham—R7

both ways. At every hour and half-hour we had to call various receiving stations, some mobile and some fixed. At 10 a.m. we dispatched one of these from the Parade with much waving of white rags!

10.10 saw a QSO with G2DZ—R8 both ways, and at 10.15 we heard G5MG (Tottenham), who was using only 1.2 watts. At 10.35 we worked G6KP (Brockley), again getting R7-8 both ways. Duplex tests with G5IS followed at 10.50, after which he and G6CW got ready to set out in a car in the direction of Oxfordshire.

The other QSO's during the day were as follows: G6UH (Limpsfield), R9 both ways; G2DZ again, after the aerial had been moved to the South-West; G6CJ—his tone R4, our 'phone R8; G2JU, duplex 'phone—his R6-7, ours R8; G5XH (Croydon), R8 both ways; and finally G5SA (portable, near Wendover). His tone was terribly weak—R2/3—but he got our 'phone QSA 4 and duplex was almost possible.

During the afternoon, with NF's receiver on the East side of the tower, we heard on several occasions a station at the very top of the band putting out gramophone records and a slightly wobbly tone, but we never caught him signing. This was not audible on the West side, and the evidence appears fairly conclusive that this was G5MI at Ipswich, 80 miles distant. Unfortunately it is impossible to get 100 per cent. confirmation of this, but doubtless the next tests will show us whether it was or not.

Other stations heard were G6JP, G6XH, and several unidentified "tones." The longest two-way QSO was therefore G5SA at just over 40 miles; with the exception of "G5MI?" and locals we worked every station that we heard.

Unfortunately G5IS got caught in a thunderstorm on Inkpen Beacon, where he was receiving us well, and wasn't able to effect a two-way QSO.

The startling part of the whole business did not commence until we had all got down from the tower, when we heard from G5CV that he had flown 130 miles away, and was still getting us as strongly as when he had flown round the tower during the morning! His report was "R 99 plus" at 10,000 feet, somewhere north of the Wash, on top of the racket from a totally unsilenced and unscreened aero-engine!

Leaving out the more local reports, I propose to summarise those that we have received up to date. Most amazing of all is one from G6PL at Hollin Bank, Yorks., who heard us between 12.25 and 12.45, when our aerial was pointing North-West. He reports us as "R2 to R4, modulation about 70 per cent." This is, of course, miles beyond the "optical" range, and must be taken as a freak, although it is undoubtedly a world's record for "ground-to-ground" work.

Next best is G5IS from Inkpen Beacon—something like 60 miles—where we were QSA4 R4. Three reports were received from Leicester, but as they all mentioned gramophone records, which we didn't possess, we can't take them as checking up.

G2NH heard us on a kite aerial at South Harting in the afternoon; but in the morning, on Hindhead, he tells us that we were audible 160 feet from a pair of Brown's "A" 'phones.

G2KB reported us from Dunstable, and had left his own 56 mc. gear running at Rugby, but unfortunately we did not hear him; neither did we hear G2FX of Bexhill, with whom we had skeds.

G6GZ, at Farnborough and Chobham Ridge, heard us all day, mostly at R9 plus. G6LK at Cranleigh, right down the other side of Pitch Hill, logged us at R5, R6 and R8 at various times. G5JZ heard us at Nutley, Ashdown Forest, readable 100 feet from the 'phones. This was 30 miles away.

G2GG reported us as QSA5 R5 at Newbury, 50 miles away, and a receiving station at Winchester—down in the town and not up on the hills—got us at R4 on his very first attempt at 56 mc. work.

G6OA at Westcliff, BRS 1011 at Leigh-on-Sea, G6NA at Guildford, G5AW somewhere near Guildford, and BRS1117 at Reigate, complete the reports. A tremendous number were received from London and the outlying parts, all being of the R9 variety.

G5CV is telling his own story, elsewhere in this issue. In a way his result was the most remarkable of all, since he feels sure that he could have gone on to twice the distance had it not been for the shortage of petrol. A "repeat" may possibly give a range of 300 or 400 miles.

These are the bare facts of the tests, which may not seem to be anything tremendous to those who read them. But G6NF, G6HP, and myself are not grumbling, as we had a splendid day's sport "up aloft." The gallery of the tower is something like 60 yards in circumference and about six feet wide; so that there is ample space for wandering about, with a glorious view at one's feet the whole time. On the Saturday night we gained a good idea of how much of London one could cover on 5 metres from the tower, when we saw the various districts "lighting up"; it was an amazing sight to see the lights coming on in "blocks" all over London.

The tower itself is 282 feet high, and 700 feet above the Thames—not 550, as the papers all said, for some reason or other. To the South-West one can see almost to the Isle of Wight, to the North beyond Dunstable, and to the East almost to the Coast. With a better aerial system—possibly on the very top of the tower—we ought to be able to do reliable two-way work over 80 miles at least.

No date has been fixed, as yet, for a repeat, on account of the frequency with which Conventionettes and Field Days take place throughout the summer. Incidentally we have to apologise to the Maidstone gang; we are told that the attendance at their Conventionette was sadly depleted. But it was impossible for us to fix another day for the tests, and rather than leave them over indefinitely we had to go ahead.

In conclusion I want to thank G6NF and G6HP personally—NF for the transmitter and for his hard work in rigging it up and moving it about, and HP for his valuable help as operator and "handyman," as well as his step-up transformer; the Palace mains being 100 volts and all the gear being equipped with 230-volt primaries! Likewise we all want to thank those who took such an interest in the tests and made the results possible.

STRAY.

We regret that an error was made in the address of Mr. Tinling, G6II, in the last issue. This should read: "Gidlands," Wellington, Som.

From London to the North Sea.

BY DOUGLAS WALTERS (G5CV).

IN connection with the reception of 56 mc. signals on Sunday, May 21, some rather interesting and successful experiments were carried out in an aeroplane especially chartered for this purpose by the *Daily Herald*.

In view of the fact that no 'plane was obtainable with screened ignition leads or other anti-interference devices fitted, I had some doubt whether reception through the ignition interference would be possible. A short test was therefore conducted on Saturday afternoon in conjunction with G6JP, of Hammersmith.

At Heston Airport no signals were audible when the plane was on the ground, but this was quite understandable, for the aerial was surrounded by metal hangars.

As soon as the 'plane left the ground, 'fone signals from G6JP were received at full volume. We circled over Hammersmith and since reception was quite good returned after half-an-hour.

At this juncture I might mention that the aerial consisted of a 9-foot length of rubber covered cable, suspended between a point half-way along the wing of the Puss-Moth 'plane and a part of the fuselage three feet from the tail.

In order to avoid excessive ignition QRM, a 15-foot length of "Receptu" screened cable was used to connect this aerial with the receiver. This had to pass through an open window of the cabin, with the result that we had to put up with an icy blast. This screened lead made reception possible, but even then the incessant interference was deafening—the worst I have ever experienced.

Two completely shielded 3-valve super-regenerative receivers were taken, one belonging to myself and the other to G6JP. Before leaving on Sunday morning we attached an extra 9 feet of aerial wire to the other wing, but the QRM was so greatly increased as a result of this that we had to return to the aerodrome and remove it.

At 11.54 a.m. we started once again and flew at an altitude of 3,000 feet towards Hammersmith, and thence to the Crystal Palace. Immediately we left the ground G6JP was heard calling us with 'fone, the volume being tremendous. Tuning a little below G6JP, a colossal carrier was heard and at exactly 12.0 a.m. G6QB was heard calling G2FX from the Tower of the Crystal Palace.

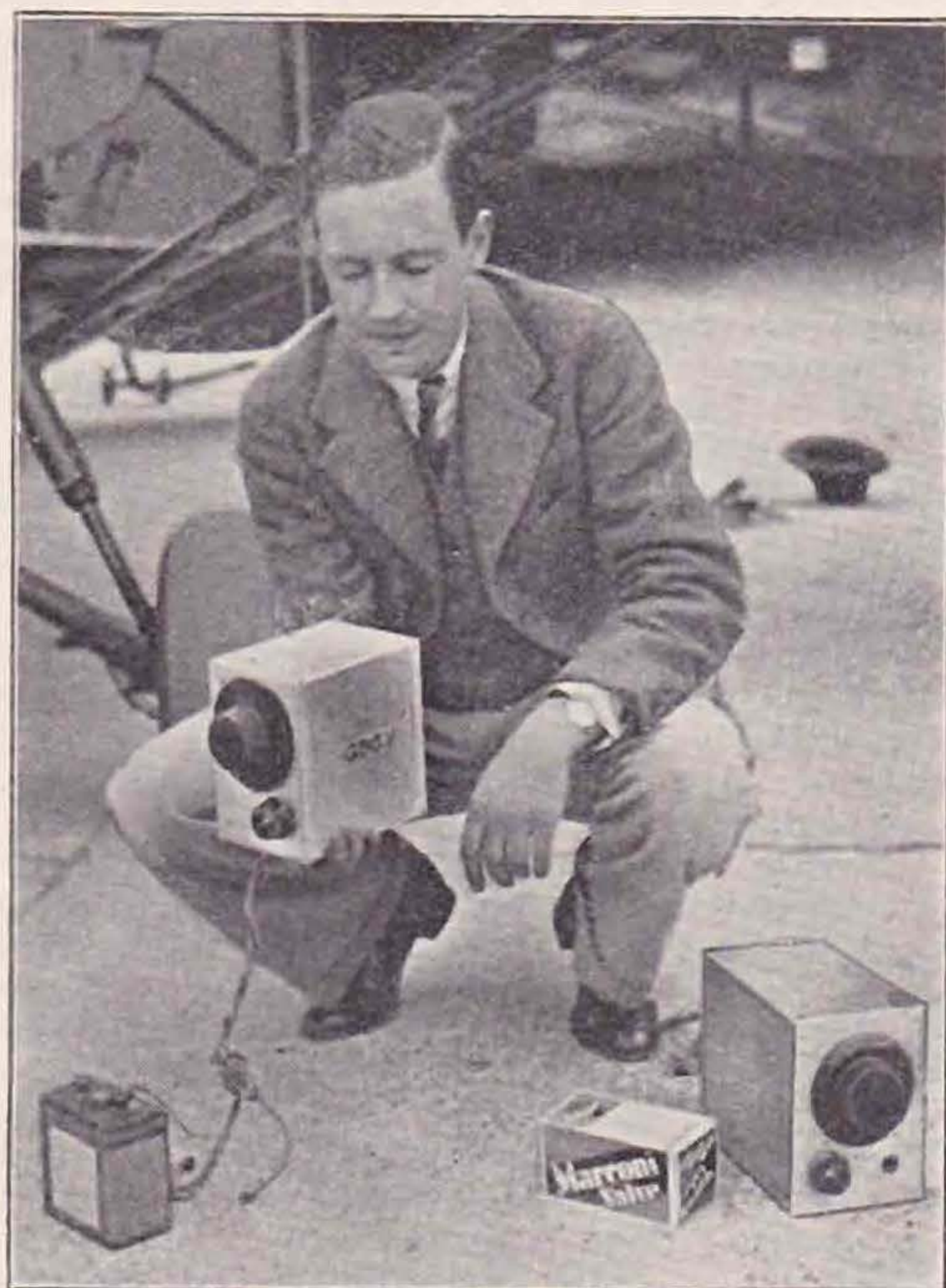
These two transmissions were very close together and difficulty was experienced in separating them until we were further away. During the next half-hour, still flying at 3,000 feet (the minimum height allowed over London) about a dozen other 56 mc. signals were heard, the weakest being R7 over the QRM. G6UH playing a gramophone record wiped out half of the band, in point of fact, the strength was so great that a reduction of H.T. voltage was necessary to render his 'fone intelligible.

Tuning over the 56 mc. band was amazing—just like the 7 mc. band on a Sunday morning! About six R9 'fone stations and many more with I.C.W. QRM from several 'fone stations prevented many

calls being identified, but the following stations were heard at R9 for varying periods:—G6JP, G6QB, G5MG, G6CJ, G6UH, G2JU, G6VA, and G5?H.

Most of these stations faded out abruptly as we passed over North London and steered in an N.W. direction. The last stations to be heard as we left London some 20 to 30 miles behind were G6QB, G6JP, G6CJ and G2JU. At a distance of about 40 miles from London, G6CJ faded out and G2JU was too weak to read. The remaining two stations were G6QB and G6JP, both of which continued to come in R8-9.

G6JP was heard calling the 'plane and we found difficulty in determining our position owing to the poor visibility. The previous day the visibility at 3,000 feet was 40 miles, and a marvellous view over London was obtained.



G5CV with the two portable receivers taken on the flight.

Our log was as follows:—

12.14.—At an altitude of 6,000 feet, passing over North Weald aerodrome. G6JP heard at R9 calling G5CV.

12.15.—A station was heard calling G5QB with 'fone. Evidently the operator was confusing this call with G6QB. This station was never identified and I shall be glad to know the call sign.

12.17.—Still at an altitude of 6,000 feet, G6QB was heard with 'fone R4-5 with *no aerial*, although the receiver was completely screened!

12.24.—G6QB heard again at terrific strength; my colleague in the 'plane entered in the log the strength as R10. We were then 60 miles north-east of London.

12.37.—Altitude 8,000 feet. Heard both sides of the QSO between G6CJ and G6QB (R9).

12.47.—G6QB's 'fone came through well. We were then about 90 miles from London.

12.58.—East Coast-line in sight and G6QB just audible with *no aerial*!!

Being unable to determine our position, we circled at a low altitude over the coast-line. Shortage of fuel was also worrying us for we were unable to find an aerodrome where a fresh supply of petrol could be obtained. We climbed again to over 10,000 feet, an altitude of two miles. At 1.5 p.m. G6QB was heard (R9) calling "test" with I.C.W. and he then replied to a station whose call-sign he was unable to get. The whole of this message was received with ease. We were then 130 miles from London.

1.26.—The Wash was in sight, and we had just passed over Hunstanton and were heading for the North Sea.

We continued at an altitude of 10,000 feet for some time but it certainly was not very pleasant. Fortunately the heating apparatus had started to work better but we were still frozen. The effect of this high altitude was made very noticeable when a fountain-pen belonging to my colleague, Mr. Stubbs-Walker, began to squirt green ink all over my trousers. Above the roar of the 'plane I tried to tell him in no uncertain terms to direct the fire elsewhere, but he was powerless to stop the ink oozing out. We realised, of course, that it was due to reduced atmospheric pressure at that altitude.

1.31.—Returning via Hunstanton for London, keeping a direct south-westerly course. For the next 35 minutes nothing was heard, although a continuous watch was kept on the band. At the time I was very surprised at this, but I subsequently learnt that G6QB had altered the direction of the aerial at the Crystal Palace and it was definitely anti-directional for our 'plane.

1.42 p.m.—A station was heard giving its position as "portable at Northwood." Immediately afterwards G6VA was heard calling G6CJ at full R9, although a few minutes previous to this not a sound

was audible on the band. We were then about 60 miles from Hammersmith.

2.24.—Flying at an altitude of 7,000 feet, G6QB was again picked up at only R5, the weakest strength at which he was heard during the whole flight. Whilst idly turning the dial, I heard a high pitched note outside the 56 mc. band. On adjusting the "tank" condenser to about 6 metres, this station, as well as another quite near by, was tuned-in at R7 at 2.32 p.m. From one station a carrier constantly modulated with a fairly low frequency note was heard, and the other one sounded as if someone was adjusting a buzzer and not obtaining a great amount of success with it. We were then north-west of Epping Forest.

2.40 p.m.—Near Hendon Aerodrome, G6CJ, G6QB and G6VA were all heard at R99.

Having worn the 'phones for nearly four hours on end, we both decided to switch off. We had accomplished what we had set out to do and although shortage of fuel prevented us from carrying on until signals really faded out, results were very encouraging. I feel convinced that had we been able to carry on in a more northerly direction we should have received G6QB up to a distance of at least 250 miles, if not more. As it was, at a distance of 130 miles from London his signals came in with full R9 strength. Severe "air-pocket" bumps often altered the tuning, but on the whole this was not very critical.

The result of this reception test was very satisfactory, in spite of the numerous difficulties we had to contend with. The roar of the aeroplane engine, the terrific noise from the ignition (which sounded like a machine-gun) added to the "mush" sound, which is characteristic of the super-regenerative receiver, all combined to provide a deafening background, and I was amazed at the strength with which signals burst through. There is little doubt that many other stations would have been audible at greater distances from London had the 'plane been fitted with anti-interference devices.

In conclusion, I wish to tender my sincere thanks to the following firms who so willingly co-operated in supplying apparatus:—

Marconiphone, Ltd., for all the Marconi valves and batteries used, as well as the spares taken in the 'plane; British Radiophone, Ltd., who supplied a length of "Receptru" screened aerial lead-in, and Kolster-Brandes, who supplied two pairs of Brandes headphones.

Strays.

Mr. A. H. Brown (BRS865) states that Mr. T. F. Smith (W5VA), Texas State Hotel, Houston, would be glad to arrange schedules with a QRO British station. W5VA uses 500-watt crystal-controlled on 7,050 kc.

* * *

W8CNC (Mr. J. R. Magee, 847, Prospect Avenue, N.W. Warren, Ohio) advises us that he will transmit on 3.5 mc. from 04.00 to 06.00 G.M.T. every Sunday morning during the next few months. He asks G stations to look out for him on this band, and requests BRS's to report on his signals. His transmissions will be made at half-hourly intervals, and he will stand by for replies at the conclusion of each call.

Mr. E. T. Somerset, better known to us as G2DT, but now resident in Kenya Colony, has recently become betrothed to a Johannesburg lady. On behalf of his many friends at home and abroad, we wish him good luck in his married life, to which state he hopes to aspire early in June.

Mr. Somerset can be reached *via* Barclays Bank, Ltd., Mombasa, Kenya.

* * *

Mr. J. L. Cowley, Honorary Secretary of the City of Belfast Y.M.C.A. Radio Club, advises us that Mr. F. Paige, BRS701, has qualified as the ninth operator of the Society's station, GI6YM.

HIC ET UBIQUE.

Society Notes—QSL and QRA Sections—Correspondence— Reception Tests.

(Continued from page 375.)

The fact that conditions were so good prompts the suggestion that "bad conditions" and lack of active stations" are two phrases with but a single meaning, for it would seem that when a large number of Empire stations are active conditions appear good, and DX is plentiful, but when only a small number are active, conditions are blamed for the lack of DX.

There is nothing comparable to a contest of this kind when it comes to showing up the weak spots in the layout and design of an amateur station. How many of us must have realised, rather ruefully, that our receivers were not all that could be desired? Strange skip effects, we agree, were responsible for many of the missed contacts, but in other cases inefficient receivers were probably to blame. The non-transmitting entries showed clearly that much DX was lost to British stations, and we are justified in assuming that a similar condition existed in other parts of the Empire.

Although interest this year reached a very high level, we do not intend to remain satisfied until every amateur in the Empire who has a flair for long-distance work, and who has at heart the interest of promoting Empire friendships, takes a hand in the event of the year.

Many important alterations were made to the rules for this year's Contests, and from information available we believe they were regarded as an improvement, but for those who may have felt they were not quite fair, we would point out that the task of preparing rules for Contests of this nature is not an envious one. We believe that the method of claiming points can be improved upon, and already steps are being taken to further this end.

The interest shown by non-transmitting members has been a gratifying feature of the Contest, whilst the support given by non-members of the Society, who are members of Honorary Affiliated B.E.R.U. Societies, will, we hope, result in them joining us as full members.

The Contest revealed a general high standard of excellence of which every Empire amateur may feel justly proud, for not only was it a test of good design and operating ability, but also of sheer physical endurance. After a week-end of B.E.R.U., the very sparrows in the treetops seemed to be calling "Test"!

In conclusion, we again tender our heartiest congratulations to the winners and to those less fortunate we would remind them that there will be another chance next year. Finally, to those who did not compete—how about it, O.M.s?

Convention 1933.

After careful consideration Council have decided to arrange the Eighth Annual Convention in London during the period August 18-19.

It is appreciated that these dates may be unsuitable for certain members, but as a result of informa-

tion received from the provinces, it has become apparent that if the Convention is to be a success, it must take place during the time the National Radio Exhibition is being held. As mentioned last month, the dates fixed for this event are August 15-24.

Arrangements have been made for the Convention dinner to be held at the Florence Restaurant, Rupert Street, London, where the difficulties surrounding last year's dinner will be overcome.

Provincial members desirous of having accommodation found for them, and London members willing to accommodate provincials, are requested to communicate without delay to Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4.

An attempt will be made this year to provide more opportunities for informal discussion, but to enable headquarters to proceed with the plans in mind, provincial members who propose attending are asked to notify us immediately.

It is proposed to arrange a *Conversazione* on the Friday evening of Convention, during which time provincial and London members will be invited to contribute ten-minute talks on subjects of amateur interest. Offers in this connection will be welcomed as will other suggestions aimed at improving the arrangements for the week-end.

District and County Representatives.

Council have decided that in future all D.R.s and C.R.s shall take office as from January 1 each year. This decision has been considered desirable in view of the alterations in Convention dates.

Nomination forms for County Representatives will therefore appear in the September issue of the BULLETIN, and voting forms in the November BULLETIN.

District Representatives will, as hitherto, be appointed by Council, but before making such appointments; advice or suggestions from C.R.s and interested members will be considered providing they are received at headquarters not later than October 31.

3.5 MC. Permits,

Members holding 3.5 mc. permits are reminded that the band may only be used for week-end work during the months June to September.

The Society's Publicity Pamphlet.

Arrangements are being made to produce a revised edition of our publicity pamphlet, "What is Amateur Radio?" Council invite members to submit designs for the front cover and suggestions for a more suitable title.

The member submitting the best design will be given a free subscription.

Designs must reach Headquarters not later than July 1.

Praise for the Amateur.

We cull the following from "Free Grid's" comments in our contemporary, *Wireless World*, dated May 19, 1933:—

"A Chance for the Government."

"Over a year ago I expressed the opinion that Television (or Radio-scopy, as I prefer to call it) would never make headway while the present system of moving mechanical parts was persisted in. Since that date several eminent authorities have endorsed my opinion.

"It almost seems as though the whole business ought to be handed over to radio amateurs, who might be able to put the same sort of jerk into it that they did in the matter of broadcasting in 1922, and in short-wave pioneering during the decade following. Government Departments and commercial interests, hovering over the work of amateurs like vultures, as they have done in the past, could then follow their custom of swooping down and taking all the credit, as is their wont, and then radioscopy would take its place on an equal footing with its twin sister, radio-phony."

Thanks, Free Grid—it is not often we amateurs have such *unbiased* praise bestowed upon us.

QSL Section.

I regret that there is nothing to report owing to the fact that I have been out of touch with the work of the Section for the month owing to holidays and the little upset mentioned in these notes last month.

With regard to the Council's recent ruling on the subject of non-members' cards, it has been decided to hold a meeting of the QSL Section Sub-committee with a view to going more thoroughly into the whole question, as it appears that overseas cards are being delayed in delivery to non-members owing to their being returned to the senders, who are not able to distinguish between R.S.G.B. members and others. The Society naturally has no wish to inconvenience any amateurs overseas, but at the same time it is strongly felt that the few "anti-social" amateurs who for reasons best known to themselves resolutely refuse to work hand-in-hand with their fellow-amateurs in this country should not receive gratis those benefits of membership for which the general membership has to pay.

It is with the idea of effecting some satisfactory solution to this problem that the Sub-committee is being held, and a notice of the decision will appear in these notes when ratified by Council.

QRA Section.

Manager: M. W. PILPEL (G6PP).

NEW QRA'S—

- G2CB—R. C. SCRINE, 8, Millicent Road, West Bridgford, Notts.
- G2CF—W. A. D. HOWES, Old Mill Cottage, Cowbeech, near Hailsham, Sussex.
- G2CS—E. MARTIN, Eden Villas, Burham, near Rochester, Kent.
- G2CX—J. D. CHISHOLM, 76, Court Hill, Sanderstead, Surrey.
- G2DB—D. W. BERRY, 5, Brookvale Avenue, Binley Road, Coventry.

Credit Accounts.

Numerous instances have occurred recently of members ordering items from the Sales Department without forwarding a remittance. An investigation has shown that certain of these members have ignored repeated requests for the amounts outstanding to be cleared, with the result that Council have now decided that in future no items will be supplied unless cash is sent with order.

Members ordering goods are requested to study the price lists published in the T. & R. BULLETIN; many members cause themselves and headquarters staff endless trouble through failure to remit the correct amounts when ordering.

Sales Department goods *cannot* be despatched C.O.D.

A Silent Key.

It is with deep regret we have to record the death of Mr. Ewen Cameron, BRS1035, lately of Edinburgh.

Mr. Cameron was for many years a well-known W6 amateur and intended taking out a G call, had not illness intervened. Our sympathies are accorded to his family and many friends.

- G2DD—H. F. SMITH, 112, Earlsdon Avenue, Coventry.
- G2FD—F. W. DAVIES, 67, Willowdale Road, Walton, Liverpool 9.
- G2GK—F. J. WADMAN, "Widecombe," Dale Road, Walton-on-Thames, Surrey.
- G2GT—W. C. G. SMITH, 16, Fairlawn Road, Montpelier, Bristol.
- G2HL—T. WOLSTENHOLME, Chesham Post Office, Bury, Lancs.
- G2HM—N. BLACKBURN, 4, Huntroyde Avenue, Tonge Moor, Bolton, Lancs.
- G2HN—E. HOWELL, 6, St. Paul Street, Chippenham, Wilts.
- G2IC—G. A. CHAPMAN, 109, Cheriton Road, Folkestone, Kent.
- G2QB—R. W. BAILEY, Bay Lea, Pit Lane, Widnes, Lancs.
- G2YG—W. H. ANDREWS, 5, Castleford Avenue, London, S.E.9.
- G5JO—L. JONES, "Mella Loona," Leys Road, Cambridge.
- G5ND—H. G. NEWLAND, 9, Batoum Gardens, London, W.6.
- G5RF—L. F. HUNTER, 15, Temple Street, Rugby, Warwickshire.
- G5SV—M. F. SOMERVILLE, "Sunnyside," Peacehaven, Sussex.
- G5UM—J. H. HUM, BM/VAMY, London, W.C.1.
- G5XD—B. C. CHRISTIAN, 1, Tudor Avenue, Lower Bebington, Cheshire.
- G6AY—A. HEMBURY, 5, Rosewood Gardens, Sheriff Hill, Gateshead, Durham.
- G6LB—L. J. FULLER, 85, High Street, Chelmsford, Essex.
- G6QF—A. M. ROBERTSON, 27, Ladysmith Road, Edinburgh 2, Scotland.
- G6RF—C. R. QUINN, 44, Emerson Road, Coventry.
- G6RR—R. A. ROWDEN, Rydon Crest, Countess Wear, Exeter, Devon.

G6RT—R. E. THOMPSON, 67, Fort Street, Broughty Ferry, Angus, Scotland.
 G6XR—H. V. COOK, "Brentwood," Stoke Green, Coventry.
 2ABT—J. MILLIKEN, 3, Somerton Road, Belfast, Northern Ireland.
 2ACY—J. R. TUCK, 18, Newfield Road, Coventry.
 2ADC—S. H. WHITLEY, 74, Stretton Road, Leicester.
 2AFO—J. COWAN, 18, London Road, Belfast, Northern Ireland.
 2AIF—J. W. SWINNERTON, 35, Friars' Road, Coventry.
 2AIM—C. E. CLARKE, 24a, Hill View Gardens, Finchley Lane, London, N.W.4.
 2AJI—J. K. CONSTABLE, 16, Highland Road, Coventry.
 2AMM—T. G. WILLEY, 8, Filey Road, South Cliff, Scarborough, Yorks.

2AUT—COVENTRY SHORT-WAVE RADIO CLUB, 42, Jordan Well, Coventry.
 2AYA—J. M. ADAMS, 24, Northfield, Donaghadee, Co. Down, Northern Ireland.
 2BIU—R. PALMER, 44, Kingsland Avenue, Coventry.
 2BJI—H. CHATER, 175, Alderman's Green, Coventry.
 EI4F—A. C. RIAL, "Clonlost," Killiney, Co. Dublin, I.F.S.
 EI5F—H. HODGENS, Technical School, Dublin, I.F.S.
 EI6F—D. O'FARRELL, Park House, Booterstown, Co. Dublin, I.F.S.
 BRS981—TELEGRAPHIST E. J. SCUDDER, H.M.S. *Vanquisher*, G.P.O., London.

The following are cancelled: G5MV, 2BFV, 2BMJ, 2BMX, 2BQO, 2BRT, G2DT.

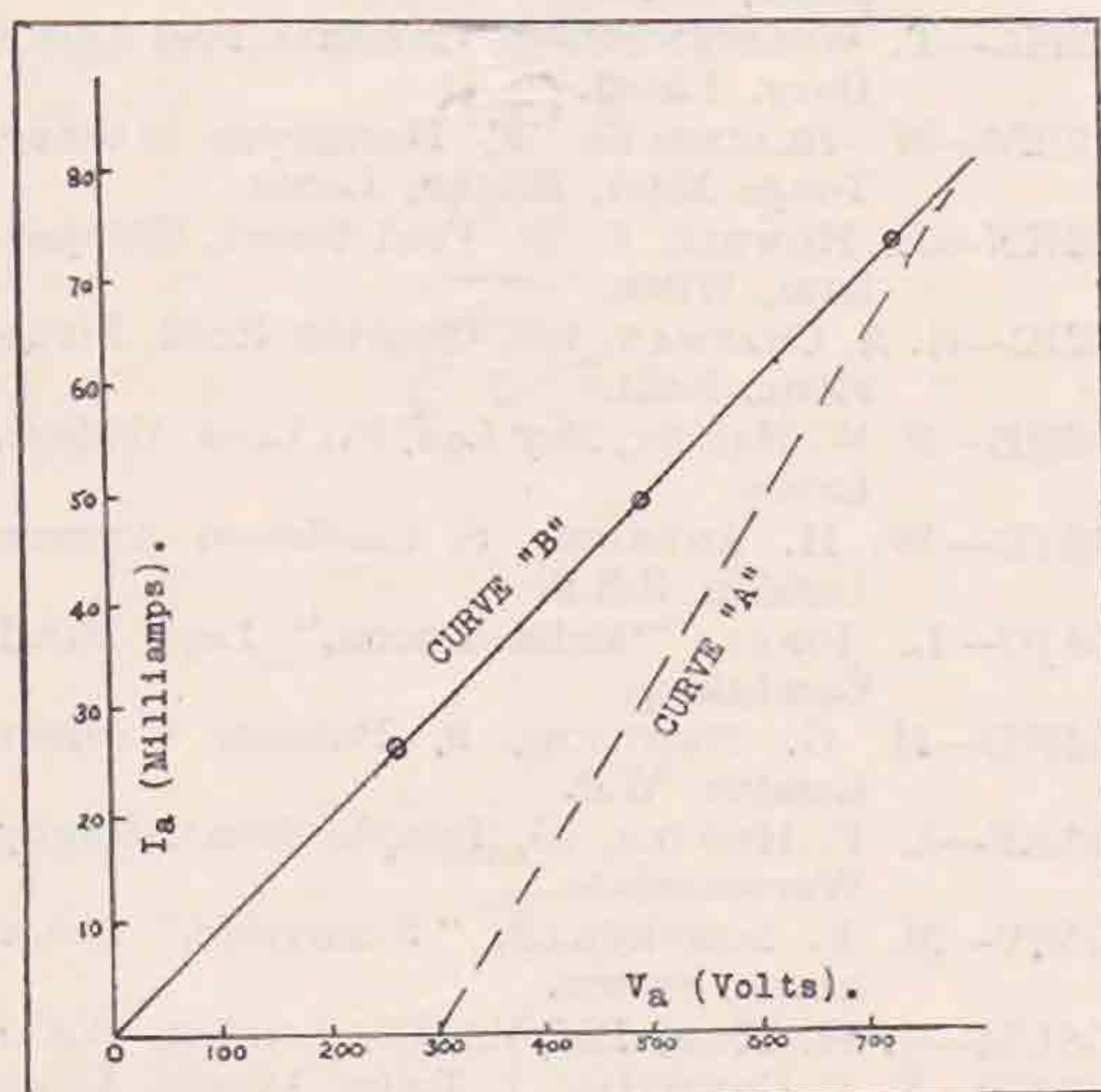
CORRESPONDENCE.

The Editor does not hold himself responsible for opinions expressed by correspondents. All correspondence must be accompanied by the writer's name and address, though not necessarily for publication.

Operating Impedances.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I have read with interest G5CD's letter referring to my article on Modulation, and the assumption that the modulated valve behaves as a pure resistance. First of all, I am sorry that



$$\text{Curve "A"} = \frac{\delta V}{\delta I} = 4,600 \text{ ohms.}$$

$$\text{Curve "B"} = \frac{\delta V}{\delta I} = \frac{V}{I} = 8,250 \text{ ohms.}$$

I have not the means at my disposal of measuring the dynamic impedance as I think that with a T.P.T.G. without any bias other than that supplied by the grid current flowing in the grid leak the results might be different. In the case of the neutralised power amplifier that G5CD has taken

there is no doubt a fixed battery bias, and this remains constant, with the result that at low values of anode current, if the drive is not very powerful, the point of cut-off will be reached and perhaps Curve A obtained. Measurements made on my T.P.T.G., however, gave the result shown in Curve B, and although these readings were taken one point at a time and not by a dynamic method, as there is no inductive or capacitive effect coming into play, I fail to see that this will make any difference at frequencies of the order of 1,000 cycles.

Before my article was written I made some measurements on my transmitter: the P.M.24D. gave about 8.5 watts of pure tone and R.M.S. volts across the speech transformer indicated that above 80 per cent. modulation of 25 watts could be obtained, and yet, according to G5CD's statement, 60 per cent. is the maximum possible without distortion. There is one other point that perhaps G5CD can enlighten me on: I believe that the long-wave station G5XX at Daventry uses up to 80 to 90 per cent. modulation on peaks, and to do this modulation at high power is used. The output consists of two water-cooled valves as far as I can remember, and the modulators of four similarly rated valves as regards dissipation. Now the A.C. output of a triode is about 20 per cent. of its plate watts, and hence the modulation is, according to my formula:—

$$\text{Modulation} = \sqrt{\frac{2 \times \text{A.C. watts}}{\text{watts to output}}} = \sqrt{\frac{2 \times 0.2 \times 4 \text{ W}}{2 \text{ W}}} = 90\%.$$

Hoping that by these letters something definite may be established.

I am,

Yours sincerely,

A. E. Wood (G5AW),

B.Sc.(Hons.), D.I.C., A.C.G.I.

R.S.G.B. Reception Tests.

The next series of dates and periods for the Reception Tests are given below and new participants are referred to the February issue of the BULLETIN for further details. Members of all classes are invited to participate. Logs, etc., are circulated in budget form and are of interest, showing the conditions of reception in the various localities. Logs should be sent to Mr. T. A. St. Johnston (G6WT), 28, Douglas Road, Chingford, E.4, arriving at the latest on July 25.

SERIES 19.

| Test Letter. | Date. 1933. | Period. B.S.T. | Band mc. |
|--------------|-------------|----------------|----------|
| A | June 25 | 00.00-01.00 | 1.7 |
| B | " 25 | 10.00-11.00 | 56 |
| C | " 25 | 19.00-20.00 | 14 |
| D | " 25 | 22.30-23.30 | 7 |
| E | July 2 | 00.00-01.00 | 3.5 |
| F | " 2 | 10.00-11.00 | 28 |
| G | " 2 | 11.00-12.00 | 1.7 |
| H | " 2 | 18.30-19.30 | 3.5 |
| I | " 2 | 22.30-23.30 | 28 |
| J | " 9 | 00.00-01.00 | 14 |
| K | " 9 | 10.00-11.00 | 7 |
| L | " 9 | 11.30-12.30 | 56 |
| M | " 9 | 19.00-20.00 | 7 |
| N | " 16 | 07.00-08.00 | 14 |
| O | " 16 | 10.00-11.00 | 3.5 |
| P | " 16 | 11.30-12.30 | 1.7 |
| Q | " 16 | 18.30-19.30 | 56 |
| R | " 16 | 19.30-20.30 | 28 |

APPARATUS REVIEWED.

The Nicore tuning coil is Varley's latest triumph and is the result of many years of patient research work. Numerous difficulties had to be overcome, such as the production of the magnetic material for the core with a high initial permeability to avoid the large loss due to eddy currents. The core is actually in the form of fine particles, individually insulated.

These coils are probably the biggest advance in R.F. tuning since the introduction of Square Peak coils and will be sold at a price comparable with their extremely high efficiency. They are, of course, made for the broadcast bands and the individual coils or H.F. transformers, with or without reaction, sell at 10s. 6d. each, or a set of three screened and ganged, with switch gear, at 33s.

"T. & R. Bulletin."

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CONTACT BUREAU NOTES.

By H. C. PAGE (G6PA).

REGRET to have to announce this month the retirement of G5UM, the Group Manager of the 1.75 mc. Groups. Mr. Hum has been Group Manager ever since the position was created in 1931, and I am sure all members of his groups will agree with me that he did his work well. G6FO has very kindly consented to take over the position of Group Manager, and as one who is well known for his 1.75 mc. activities, I feel sure that you will all accord him your support.

You will notice that this month there is a great increase in the 56 mc. reports. The summer months are undoubtedly the best time for work on

While space in these notes is somewhat limited for ordinary reports, I would assure you that any 56 mc. material you may have, which is of general interest, will always find a place here.

On this page will be found a letter from BRS981, addressed especially to the BRS men. May I say that I am in entire agreement with him, and I hope soon to see several groups composed mainly of BRS men studying the questions raised by BRS981. There are at present nineteen groups in C.B. There is no reason at all why there should not be ninety-nine, so come along the BRS men, and make C.B. headquarters work overtime!

28 M.C. Group.

G6VP, Manager.

Interest seems to be reawakening as a result of improving conditions and, at odd times during the day Commercial and other harmonics have been frequently heard and, as will appear later, QSO's have again been possible with countries outside England.

Group 1A.—G6FV writes that he has heard the Rome-Sardinia telephony, which has been absent during the winter. G5MP is building portable gear, and hopes to carry out field work during July-September inclusive. Ground-wave attenuation will be investigated chiefly, but it is hoped that foreign stations will keep a watch for the transmissions, fuller details of which will be supplied later. Phone and ICW will be used.

Group 1B.—G5SY is still experimenting, and together with G2FN is firmly convinced that the secret of successful crystal control lies in the F.D. stage to 28 mcs. He is next trying a DETISW as 28 mc. F.D. to a WE4 211E as P.A. or the other way round. G5QA spends much time on the receiver, especially on Sundays.

Group 1C.—G6VP has been on the receiver for short periods daily and many harmonics are audible from time to time, but so far no known fundamentals were heard during the month. G6WN state that they have recommenced activities in earnest on 28 mc., but like G6VP, nothing but harmonics are so far audible with the exception of speech from Rome and Sardinia on the 15.5.33 R2. G6BC has had little time for 28 mc. last month on account of rebuilding operations for the tests just held (56 mc.?). He works regularly with G5QY, of Gosforth, Newcastle. He wants to know where "Tourmaline" Blanks or a finished 28 mc. crystal are obtainable.

G5QY writes that on the 17.5.33 at 14.15 G.M.T. he was QSO OK1AW. He worked him solid until 14.50, when he had to stop. His signals were reported T9 R4/3 QSA 4/5 against T9 R6/2 QSA 5/4. He states that his receiver is conventional O.V.1 Schnell and transmitter CO FD, FD, FDPA, with 12 watts to the PA. The antenna used was a 33 ft. Windom. He asks whether this is the second or third OK/G contact, and states that he has worked HAF as far back as 1931. It is hoped that G5QY will join the 28 mc. section of

B.R.S.—S.O.S.

DEAR O.M.'s,

The last year has seen a number of remarkable developments in the design and construction of radio receivers. H.Q.s. realise that the BRS man should be better catered for. Accordingly an article was published in the "BULL" on a mains superhet. I hope this article laid the bogie of noisy backgrounds in mains valves.

However, many men have to experiment with new components in old and therefore unsuitable circuits. Others produce the very circuits suitable, but are unable to test them.

How about those unconventional detectors, Pentodes, and the new "Westectors"? Somebody must have tried them! How many have tried Q.P.P.? Ferrocarts coils? Class B amplification? Or High Potential Pentodes? Don't you think it is time these modest violets stopped blushing unseen?

The logical conclusion is, of course, the formation of a receiver design group in the Contact Bureau.

Will anyone interested please write:—BRS981.

Telegraphist E. J. Scudder, H.M.S. *Cambrian*, Chatham, Kent.

Please say if you are better able to test or to design. The results must interest the whole Society, for everyone has a receiver.

this band, and there will be a number of keen men working there. May I ask of you all that you should forward reports on your work to C.B.? 56 mc. is still unknown territory for the majority, and it is up to those who do know something about it to pass on their knowledge, and it is for that that C.B. exists.

Perhaps you do not feel inclined to join a group and take part in regular 56 mc. work, and therefore feel that your reports are not wanted. On the contrary, all reports are of interest, and can be sent to the 56 mc. Group Manager, or, if you prefer it, to C.B.

the C.B. Since writing above, news has come to hand that G5QY and OK1AW have connected again on the 18/5/33 14.15 to 14.40 G.M.T. G5QY was T9 QSA 3 R4, OK1AW being T9 QSA 4 R 6/2.

Fading, Blindspotting and Skip Group.

G6MB, Manager.

This month there is very little of general interest that can be reported. One group centre complains of a certain amount of lack of proper support from his members. I hope those members will reform during the coming month as, unless the pre-arranged schedules are definitely kept a continuous record is impossible and data becomes almost valueless.

Most of the groups are on routine observation work, which calls for little comment. The new 2B has made a good start and are fixing up observation schedules. The G.C. of 2D (G6WM) resigns, as he finds it necessary to put business before pleasure. 2ASX of 2C is preparing a summary of the past year's working. This is a good idea and I hope it may be circulated to all the "two" groups.

Theory Group.

BRS865, Manager.

Since notes last appeared in the BULLETIN one or two changes have been made. In 3A, G2KB has been obliged to resign on account of increased business QRM, but his place has been taken almost immediately by BRS1112. BRS981 has left 3B in order to start a group of his own, so that another member is required. G6ND (GC3B) is resigning from his position as G.C., also on account of business QRM, but he is remaining in the group.

Group 3A.—It has been decided to narrow down the activities of the group and a definite subject for practical and theoretical study has been chosen. As a result of a vote in the April letter budget, the group is to study oscillations of the Barkhausen-Kurz type, etc. This subject is particularly suited to the group both on account of the mathematical work and on account of the large proportion of BRS members in the group. Following out a scheme, not adopted, as far as I know, by any other group, we are summarising papers in the *Philosophical Magazine*, *Proceedings of the I.R.E.*, etc., and thus are finding out what is known already before advancing ideas of our own. This month's letter budget weighed nearly half a pound! We are not precluding articles of a general nature, and G6OT, for example, sent along an interesting article on circuit losses.

Group 3B.—I have nothing of general interest from G6ND this month. I understand, however, that there is considerable apathy in 3B. G6ND hopes to carry out experiments with the new screened down leads as feeders, as he thinks these should make a more efficient system of feeding an aerial than the ordinary Zepp. arrangement. No data is to hand as to the work to be carried out on the accuracy of the formulæ for antenna length.

Atmospheric Group.

G2GD, Manager.

This group has been pursuing the theory reported in the May BULLETIN, and some interesting results have emerged. G5MP and BRS1051 have kept a watch on the longer wave-bands 160 and 80 mcs., and, as would be expected, very little connection between barometer and DX conditions has so far been revealed.

G2IC and BRS1115 have been observing mostly on the 40 m. band, where there appears to be more evidence in support of the theory.

But the chief interest comes from 2AGR, BRS-1077, BRS943, and BRS960, all of whom have been listening on the 20 m. band (2AGR including a number of observations on commercials). On these low waves there is decided evidence in support of the theory and very little to the contrary. All are agreed that further investigations are warranted.

Ultra High Frequency Group.

G6XN, Manager.

This month has seen a great increase in 56 mc. activity. Before proceeding with the report thereon, may I put in a plea for more support of this section of C.B.? Judging by the number of stations active on 5 metres, there must be material for at least a dozen groups, instead of one only. The advantages of joining C.B. have been set forth frequently; I would add that our present ignorance of ultra-short wave propagation is mainly due to the lack of that co-ordination of results which becomes possible under the group system.

Three new members are welcomed to the group. G5MG and G5VY are working on 5 metres every Sunday between 9.30 and 11.30 a.m. They have been using duplex 'phone. G5MG, carrying a portable receiver five miles from G5VY, obtained good results in spite of bad screening.

G2JH is thirsting for DX, and suggests that all 5-metre stations should keep a fixed nightly schedule with this in view. Will all interested, please communicate with C.B. or with G2JH direct?

G2CZ is rebuilding, and has built a very compact "unity-coupled" push-pull transmitter in a space only $5\frac{1}{2} \times 5 \times 6\frac{1}{2}$ inches, for portable work.

G2KB and BRS77 provide the "star turn" this month. Full details are not yet to hand, but are promised, as is also an article for the "BULL." Signals from a transmitter at Southend were observed in a motor yacht as far as the Girdler Lightship (20 miles), and Tilbury (15 miles). Signals over land were also observed. Propagation was definitely better over sea. Variations in strength were observed on passing large ships. The transmitter was in an attic on the sea-front, about 50 feet above sea-level, with a half-wave vertical aerial. Prior to these tests G2KB conducted a large number of experiments around Rugby, many of them in conjunction with G6XN. The following is a brief summary of results obtained. With an input of 2 watts the maximum range was about five miles when using a 66-foot aerial, mainly horizontal. Much better results were obtained with a half-wave vertical aerial, even though the average height was less. Tests at about two miles showed that signals from the half-wave aerial were very nearly plane polarised. Best signals were obtained with both receiving and transmitting aerials vertical. With one aerial horizontal and the other vertical signals were relatively very weak. Maximum range was obtained with a straight receiver, although super-regeneration gave terrific amplification of strong signals.

Using 5 watts on the transmitter, with a half-wave vertical aerial in an attic, signals were heard at R5 at a distance of 18 miles! For this the

receiver was taken to the top of a windmill on the top of a hill. No signals were audible on ground level. This was particularly curious, since tests at shorter distances had shown no difference in strength between a receiver on the ground and five feet above the ground.

The receiver used by G2KB consists of O-V-1 + quench, the aerial being a quarter-wavelength vertical copper rod. Shorter aeriels were found to be inferior, and longer ones no advantage. After testing many transmitters, Push-Pull, Colpitts, and Ultra-audion, G2KB found the series-tuned Ultra-audion to be the most efficient.

G2JH, G6XN, and many non-group members, were present at the Gillingham field-day organised by G2IG and G6XO. This provided another "star-turn." Signals from an aeroplane, estimated to be eight miles away, were heard R4 on a straight receiver, the transmitted power being only 0.4 watts at 60 volts! Signals from G2IG were heard at R8 on super-regenerative receivers at 10 miles. Much data was collected, but full details are not yet at hand. Thanks are due to the organisers for an excellent field-day and rag-chew.

G6XN has rebuilt transmitter and receiver, the latter being on the lines of that used at G2KB.

Some tests were made both at Ealing and Welwyn, but results are not yet complete. Some details may perhaps be given, however. Signals were audible up to three miles in a car travelling at 30 m.p.h., super-regeneration being used. Yet the maximum range was only four miles under the particular conditions obtaining. Two very definite dead spots were observed. One, about half-a-mile from the transmitter is not yet explainable. The other, two miles away, was due to complete screening by a house. A hill one mile from the transmitter provided almost a complete screen. Yet previous tests on a different transmitting aerial, had shown no screening at all.

In conclusion, may I appeal for co-operation from any interested foreign "hams" who may read this? An excellent suggestion comes from OZ2P for a liaison between all interested European society groups?

2 M.C. Group.

G6FO, Manager.

I have been asked to carry on as G.M. in place of G5UM, during the latter's enforced absence from amateur radio work. I have deputed for him before, and this time say again what I said then; that I can only attempt to emulate the excellent example he sets as a lively and enthusiastic Group Manager.

The appeal in last month's issue for RX members to assist us with regard to some special and quite simple receiving observations, has elicited one reply only—from BRS967, of Hull. As we wish to cover the whole country, I would be glad if those BRS or AA men who have a quarter of an hour or so to spare once or twice a week for 1.75 mc. listening would write me direct.

Group 10A, the pioneer 1.75 mc. DX enthusiasts, carried out a somewhat hurriedly arranged schedule with the Antipodes on May 6 and 13, from 19.30-21.30 B.S.T. Four ZL's were reputed to be transmitting for our benefit at these times, but nothing was heard of them here; G5RX, G5UM, G5WU and

G6FO kept the watches, but trawler QRM and bad QRN made receiving conditions impossible.

Group 10A.—G2YI, having changed the location of his radio room, has taken advantage of this to try a different aerial arrangement, consisting of a 66 ft. span with a 38 ft. down-lead. The counterpoise is a 3-wire 50 ft. T, the whole making a very efficient 1.75 mc. radiating system. G2YI is also troubled by bad "sizzle" QRM all round the band from 200 m. down, caused by about a dozen motors in his vicinity. Till they can be silenced, things will not be easy. G5WU, a newly-joined member of the Group, has been carrying out some painstaking tests with aeriels which have yielded much interesting information. Among other things, G5WU has definitely proved that tuning the "neutralising" arm of a Zepp-fed Hertz system considerably increases signal strength when the "live" arm and roof are used in conjunction with a counterpoise as a Marconi array for 1.75 mc. working. This was discovered after having used the neutralising arm of such a feeder system for a receiving aerial, and gives quite positive results. G5WU is very anxious to have corroboration or otherwise from anyone else who has tried or will try this. He has also done much practical work with crystals, and is c.c. on 1.75 mc. at a number of frequencies, depending on the pressure under which the crystal is held! G2WS and G5RX do not report. G6FO has been working in conjunction with 5WU regarding both aeriels and crystals, and regular schedules are being maintained several times a week.

Group 10C.—G.C. G2CT reports his men as being in a state of suspended animation for the time being, as they are not yet up to strength. G2UV is rejoining and will shortly be active. G5JV and G5VY are investigating the mysteries of microphones, and some dope will be available soon. G5VT is busy with aerial alterations for more efficient 1.75 mc. propagation. 2AQW has been trying to get television from G2BS (Chelmsford), discovering after some time that he was using the wrong system for reception. Briefly, he was vertical and they were horizontal.

(Continued from next page.)

was almost the same as that observed at 46 miles. Good signal strength continued until a distance of 100 miles was reached, when fading began again. They were finally perceived for the last time at a distance of 110 miles. The experiment was repeated on August 10, and on this day the signals were last heard at a distance of 125 miles.

The receiving apparatus was then disembarked, and installed at Cape Figari, 340 metres above sea level. Rocca di Papa started transmission at 4 p.m., and the signals were picked up almost immediately. The distance between Rocca di Papa and Cape Figari is 168 statute miles!

Conclusion.

In conclusion, we must reiterate that the above is a very brief summary of the Marchese Marconi's lecture. It is hoped that it will prove of interest to the serious amateur. Those who wish to go more fully into the subject are referred to the *Electrician*, issues of December 9, 1932, and January 6, 1933, or to the reprint of the lecture issued by the Royal Institution.

BELOW ONE METRE.

(Concluded).

TURNING to the question of aerial systems, the Marchese Marconi remarked that the idea of utilising a system of unit reflectors followed logically on that of the system of unit transmitters just described. It was fairly obvious that the advantages gained by using several transmitters, working in phase, would have been lost if the same method could not have been extended to the aerial system. Accordingly, the well-known cylindrical parabolic reflector was adopted. As a considerable amount of data was already possessed, the design of the aerial system was a fairly straightforward proposition.

the grid. Therefore the plate is connected to the aerial. The electrical adjustments are very critical, and consequently current-measuring instruments are essential. Tuning is secured by varying the plate, grid, and filament potentials more or less simultaneously.

Range.

In view of the fact that many amateurs are now active on the five-metre band, and that up to now no very startling long-distance work has been accomplished, the results obtained by Marchese Marconi and his assistants on this 50-centimetre wavelength are extremely interesting.

The first demonstration was given as early as 1931, and on this occasion communication was established between Santa Margherita and Sestri Levante, a distance of eleven miles. At a second demonstration on November 19, 1931, communication was established between Santa Margherita and Levanto, a distance of twenty-two miles. On this occasion the receiver was installed in a villa at Levanto, 110 metres above sea level. The sum of the heights of the two stations was 160 metres, which is sufficient for a direct vision of 27.5 statute miles. An interesting point was that there was little or no drop in signal strength when the distance was increased from 11 to 22 miles, the apparatus being the same in each case. In these two cases, of course, the vision was direct, but in another demonstration between the Vatican city and Castel Gandolfo, there was no direct vision. Yet on this latter occasion the tests were entirely successful.

In July, 1932, further tests were carried out, a receiver being installed in the yacht *Elettra*, and a transmitter being erected at Santa Margherita. On this occasion, the optical distance was 14.6 miles, but signals were still perceivable at a distance of 28 miles. At a distance of 11 miles, signal strength began to decrease, and above 22 miles were affected by deep fading. Speech was 90 per cent. intelligible up to 18 miles, but from 20 miles until the signals could no longer be heard, modulated C.W. could be read.

At the end of July, 1932, the transmitter was moved to Rocca di Papa, 12 miles from Rome, and was installed at a height of 750 metres above sea level. On August 3, the yacht *Elettra* left for Civitavecchia Harbour. During this journey, signals were received well up to a distance of 85 kms. They then decreased in strength, but were still audible at 90 kms., when the yacht entered Civitavecchia and the reflector could no longer be directed on Rocca di Papa.

On August 6, further tests were carried out on the line Rocca di Papa-Golfo Aranci (Sardinia). The optical range here is 52 miles. Up to 58 miles, the signals were excellently received; but shortly after they began to suffer from slow and deep fading, till at 80 miles they were only audible at times. Listening was nevertheless continued, and at 87 miles signal strength suddenly increased till it

(Contd. foot of column two, previous page).

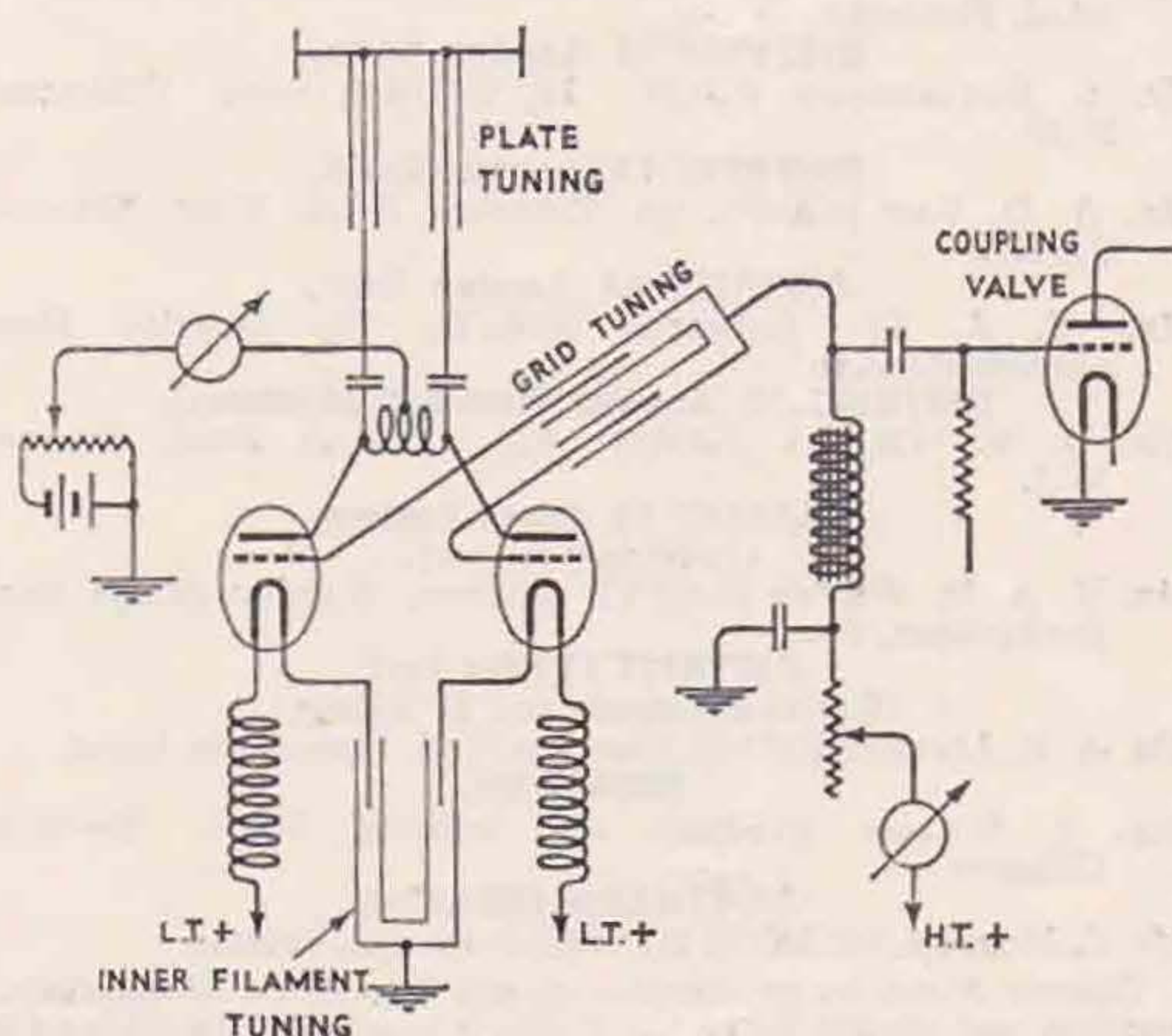


Fig. 3.—Showing the type of receiving circuit used for the 50 cms. experiments. Note that the aerial is connected to the anodes, and the output taken from the grids.

The actual construction is rather curious, and looks somewhat like a herring-bone. Space forbids a detailed description, and it will suffice to say that the aperture of the reflector is three wavelengths, the distance between the reflector-rods three-quarters of a wavelength, and the focal length of the reflector a quarter of a wavelength.

The Receiver.

When the first receiving tests were carried out, it was found that—as with the transmitters—the plate grid lecher-wire circuit was inadequate. It was also discovered that the transmitting valves would not function as receiving valves, a fact which thus upsets the theory that with Barkhausen circuits the same valves may be used both in the receiver and in the transmitter.

It was therefore necessary to design a new receiving circuit, and also a new type of valve for use in this circuit. The new circuit is shown in Fig. 3. It will be noticed that it employs plate, grid, and inside and outside filament tuning. It will also be noticed that in contrast with the transmitter, the plate is here the active electrode, not

NOTES and NEWS



BRITISH ISLES

DISTRICT REPRESENTATIVES.

DISTRICT 1 (North-Western).

(Cumberland, Westmorland, Cheshire, Lancashire.)
MR. S. HIGSON (G2RV), "Hebblecroft," Egremont Promenade,
Wallasey, Cheshire.

DISTRICT 2 (North-Eastern).

(West Riding, Durham, Northumberland.)
MR. L. W. PARRY (G6PY), 13, Huddersfield Road, Barnsley,
Yorks.

DISTRICT 3 (West Midlands).

(Warwick, Worcester, Staffordshire, Shropshire.)
MR. V. M. DESMOND (G5VM), 199, Russell Road, Moseley,
Birmingham.

DISTRICT 4 (East Midlands).

(Derby, Leicester, Northants, Notts.)

DISTRICT 5 (Western).

(Hereford, Oxford, Wiltshire, Gloucester.)
CAPT. G. C. PRICE (G2OP), 2, St. Anne's Villas, Hewlett Road,
Cheltenham, Glos.

DISTRICT 6 (South-Western).

(Cornwall, Devon, Dorset, Somerset.)
MR. H. A. BARTLETT (G5QA), "Donbar," Birchy Barton Road,
Exeter, Devon.

DISTRICT 7 (Southern).

(Berkshire, Hampshire, Surrey.)
MR. E. A. DEDMAN (G2NH), 63a, Kingston Rd., New Malden, Surrey.

DISTRICT 8 (Eastern).

(Cambridge, Huntingdon, Norfolk, Suffolk).

DISTRICT 9 (Home Counties).

(Bedfordshire, Hertfordshire, Essex, Buckinghamshire.)
MR. F. L. STOLLERY (G5QV), "Kingsmead," Lancaster Gardens
East, Clacton-on-Sea, Essex.

DISTRICT 1 (North-Western).

G 2YN, 6JZ, BRS1043 and 1106 continue to keep
the two Northern counties active.

Attendances at the Manchester meetings
keep up well. At the May meeting G2RA was the
lecturer. G2WQ, 2DG, 6ZU, 5MB, 2RA, 6AX,
6QA, 6GV, 5YD and 2OI all report various
activities. It is hoped to secure the services of an
expert to lecture on the subject of Class B amplifica-
tion at a future Manchester meeting.

The Cheshire members do not report, but G2OA,
6OM, 6GL, 5CN, and 2RV are known to be active.
The latter is still experiencing trouble in neutralising
a SG1.

The newly-formed MARS makes good progress,
the club room begins to look more comfortable and
already a 1.7 mc. transmitter is installed. It is
hoped to go on the air soon with a special call sign.

DISTRICT 2 (North Eastern).

The Annual Conventionette will take place at
the Guildford Hotel, The Headrow, Leeds, on
Sunday, July 2. The Conventionette will open
at 2.30 p.m., tea will be served at 5.30 p.m.,
and the business meeting will follow. The change
to Sunday has been made to permit members in
the Middlesbrough area to attend.

DISTRICT 10 (South Wales and Monmouth).

(Monmouth, Glamorgan, Breconshire, Carmarthen, Cardigan,
Pembroke.)
MR. A. J. E. FORSYTH (G6FO), "St. Aubyns," Gold Tops,
Newport Mon.

DISTRICT 11 (North Wales).

(Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth,
Montgomery, Radnorshire.)
MR. T. VAUGHAN WILLIAMS (G6IW), "Malincourt," Grosvenor Ave.,
Rhyl, Flintshire.

DISTRICT 12 (London North).

MR. S. BUCKINGHAM (G5QF), 19, Oakleigh Road, Whetstone,
N.20.

DISTRICT 13 (London South).

MR. A. D. GAY (G6NF), 49, Thornlaw Road, West Norwood,
S.E.27.

DISTRICT 14 (London East).

MR. T. A. ST. JOHNSTON (G6UT), 28, Douglas Road,
Chingford, E.4.

DISTRICT 15 (London West and Middlesex).

MR. H. V. WILKINS (G6WN), 81, Studland Road, Hanwell,
W.7.

DISTRICT 16 (South-Eastern).

(Kent and Sussex.)
MR. H. A. M. WHYTE (G6WY), Killiney, Worsley Bridge Road
Beckenham, Kent.

DISTRICT 17 (Mid-East).

(Rutland, Lincoln and E. Riding.)
MR. A. E. LIVESY (G6LI), Stourton Hall, Horncastle, Lincs.

SCOTLAND.

MR. J. WYLLIE (G5YG), 31, Lubnaig Road, Newlands,
Glasgow.

NORTHERN IRELAND.

MR. C. MORTON, (G15MO), 27, Bristol Avenue, Belfast.

District Notes for publication should be written as concisely as
possible and should be in the Editor's hands by the 25th of the
month preceding publication. They should be of a general rather
than personal nature. Individual reports from County Representa-
tives will not be accepted for publication.

Several members in the Leeds area are concen-
trating on 56 mc. work. G6BX is running nightly
schedules, using 'phone and C.W.; G5CX has a
transmitter working into a half-wave Zepp aerial;
whilst G5SZ has worked up to 12 miles.

The D.R. visited the Middlesbrough area on
May 18, when an interesting discussion on general
amateur subjects took place. Local field days are
planned for the summer, and at least two members,
G5XT and 6CV, hope to use 56 mcs. gear at these
events. G6YT is experimenting with remote
control, using home-made relays. Morse practices
are being planned for non-transmitting members.
G2FO, 5QU, 5XT, 6CV, 6YT, 6ZT, 2AVM, BRS922
and 1016 are active.

Considerable activity is reported from Northum-
berland and the Newcastle area. The last monthly
meeting of the N.E.A.R.S. was attended by 25
members, when a lecture on the action of the leaky
grid detector was given by G6BC. The Society
now has a membership of 32 and invites all inter-
ested amateurs, living in the Newcastle area to
apply for membership. Future meetings will
take place at 14a, Pilgrim Street, Newcastle-on-
Tyne, on June 18, July 9, August 6, September 3,

October 1, November 5, December 3, commencing at 6.30 p.m.

G2CO, 2GC, 2TJ, 2XT, 5LH, 5QY, 6AY, 6BC, 6GC, 6QT and 6YL are working on two or more bands. 2ARQ, 2AWA, 2AUB, 2AXX, 2BLD, BRS991, 1057, 1107 and 1109 are active from the non-transmitting side.

G6YL is to be congratulated on having made over 50 consecutive contacts on schedule with ZSIH, using an input of between 9 and 10 watts.

The West Riding group has been more active recently than at any time for months, due probably to N.F.D. interest. G5SZ has been heard by G6PL (12½ miles) on 56 mc., whilst G2WS, 5CX, 5HB, 5TQ, 5ZI, 6BX, 6KU, and BRS844 are all active on one or more bands.

DISTRICT 2 CONVENTIONETTE

Guildford Hotel, The Headrow
LEEDS

SUNDAY, JULY 2, 1933

Meet at 2.30 p.m. Tea at 5.30 p.m.
Business Meeting 6 p.m.

DISTRICT 3 (West Midlands).

G2KB and BRS77 are co-operating with 56 mc. experiments, their best DX to date being 18 miles, when they heard G2KB's transmitter at R5. The receiver was located at the top of a windmill, but, unfortunately, gamekeeper QRM (Q.G.K.) resulted in a broken 56 mc. oscillator! A visit was later made to BRS77's QRA at Southend, where the transmitter was erected in an attic and left running whilst some tests were made in a motor boat. Much useful data has been obtained.

G5CL is welcomed from Scotland. We hope he will continue to have as much success in the Midlands as he had in Glasgow. All the usual stations report active. Will members advise me whether they wish the letter budget restarted?

DISTRICT 4 (East Midlands).

The District Conventionette will be held on July 9. Lunch will be served at 1.30 at the Welbeck Hotel, Milton Street, Nottingham. Business meeting at 2.45, tea at 4.30. Inclusive charge 5s. per head. All members are welcome and are assured of a good time. Please advise G2IO if you are coming, so that accommodation can be reserved.

On May 14, 28 members from Leicester and Notts paid a visit to the Empire Short-Wave Station at Daventry, when a most interesting afternoon was spent looking over the station. A short tour of 5XX and 5GB followed, and to conclude afternoon tea was taken at the Wheat Sheaf Hotel, Daventry.

The Leicester Experimental Short-wave Society held a field day on May 7. Four car parties set out with DF sets to find the hidden transmitter, G6JQ. No party were successful in finding the base camp, although three parties finished within half

a mile. The transmitter was operated on 7 mc.

The next field day has been fixed for June 25 and, subject to the licence being granted, will be on 3.5 mc.

G6QB's 56 mc. transmission from the Crystal Palace tower was picked up in Leicester by two members; 2BHA on Croft Hill received his signals R4 and G6JQ received them R1-2 in Leicester. The transmission was not heard in Notts. The distance between London and Leicester is 95 miles.

The following members are known to be active:—
Notts: G2OC, 2GU, 2CB, 2IO, 5DM, 5YP, 5VU, 6CD, 6DS, 6MN, 6KX, 6KQ, 2BMR, BRS726 and 1009. 2AWC has passed his morse test and now awaits his call. Leicester: G2CZ, 5VH, 6GF, 6WU, 6JQ, 2ADC, 2AFM, 2BVN, 2BHA and BRS884. BRS866 now awaits his call.

DISTRICT 5 (Western).

The Sixth Annual Conventionette was held at Bristol on Sunday, May 7. The company numbered 64, among whom were Messrs. A. E. Watts, J. Clarricoats, G. C. Price, W. B. Weber, Col. W. S. Palmer, V. M. Desmond, F. W. Miles, E. A. Dedman, J. W. Mathews, H. V. Wilkins, and Lt.-Com. W. S. Mann, R.N., of the Admiralty, representing the R.N.W.A.R. The Vice-President presided at lunch, which was made shorter than usual, in order to leave more time for the afternoon arrangements. At 2.30, the party proceeded to the H. H. Wills Physical Laboratories, where a most instructive address was given by Mr. Mitchell, of the Laboratory staff. Several experiments added to the interest of the lecture, which included some tricks played by a piece of radium on a thermionic relay! A detailed inspection of the building followed, after which Mr. Arthur Watts showed his film taken during the time he was in Spain for the Madrid Conference.

Following tea, the Secretary gave a short talk outlining the recent progress of the Society, and paid an eloquent tribute to the excellent work carried out by Mr. L. Hill, of Bristol, in connection with the band occupancy checks. He emphasised that this work had proved of the utmost value to Mr. Watts during the time he was at the Madrid Conference.

Commander Mann then gave a short talk on the progress of the R.N.W.A.R., and finally, Dr. W. H. Marston showed several interesting films, including that of G5ML winning the B.E.R.U. Trophy last year.

The D.R. takes this opportunity of again thanking everybody for the manner in which they supported the Conventionette, and in particular desires to convey his appreciation to Mr. Watts and the other London members who, with the Birmingham party, did so much to make the event a further happy milestone in the history of District 5.

Finally the thanks of the whole District are extended to Mr. Mitchell and the staff of the Wills Laboratories for their contribution to an enjoyable day.

DISTRICT 6 (South-Western).

The good conditions on 14 mc. have been responsible for considerable activity in the district recently. G5WY has made his initial contacts with LU, PY and J; G5SY has obtained consistent R9 reports with PY, whilst most of the

other active stations report a good crop of DX. G2FN, 5SY, 5QA, and 6RP are active on 28 mc., but the former is the only one to receive signals on that band, and they are mostly harmonics. G6KC is welcomed into the district, having taken up residence at Devonport. Plans were made during May to erect N.F.D. stations. The D.R. is building a Transceiver for field day work during the summer, and hopes to have this equipment working on 3.5 and 7 mc. at a spot 7 miles north of Okehampton. The portable station will be operated during Sunday afternoons, when tests and schedules will be welcomed. The transmitter is a push-pull ultraudion. The following stations report active: G2BL, 2FN, 2ZP, 5QA, 5QS, 5SY, 5VL, 5WY, 5YB, 5YR, 6QH, 5RP, BRS836, 958, 1088, 1089, 1100.

No. 7 DISTRICT CONVENTIONETTE

CAFE ROYAL,
PALMERSTON RD., SOUTHSEA.

Sunday, June 25, 1933.

- 12.30 p.m. Meeting at the Cafe Royal.
- 1.30 p.m. Lunch. Followed by the business meeting.
- 5.0 p.m. Tea, followed by station visits, bathing, etc.

Please advise G2NH of your intention to come by June 20 at the latest.

The Conventionette by the Sea.

DISTRICT 7 (Southern).

The principal event in the district this month was our field day and meeting at Winchester on May 14, which was a great success from all points of view. Those present included G2YL, 2DC, 2VV, 2GG, 2WK, 2DZ, 2NH, 2PF, 5LA, 5NF, 6BU, 6GS, 6GZ, 6NZ, 6SS, 6NK, 6XM, 2AJA, BRS157, BRS911 and friends. The meeting place was at BRS911 (Winchester), and the party was found to be able to produce two complete 56 mc. transmitters and no less than eight 56 mc. receivers. The base station was soon erected at the meeting place, and the party then split up into groups with receivers to visit all the high spots in the neighbourhood. The portable station was assembled on Winchester Downs, about three miles from the town, and with the first call established contact with the base station. A two-hour demonstration of duplex telephony then followed and was of much interest to all who were having their introduction to 56 mc. work.

No DX was attempted owing to lack of time, the real object of the demonstration being to create interest in this particular branch of amateur radio. Great credit is due to G6GZ, the Hants and Berks C.R., who organised the meeting, and our thanks are due to BRS911, who arranged the accommodation in Winchester, and also to Mr. Spooner (2AJA) for the excellent signs posted all over Winchester, which enabled everyone to locate the QRA of BRS911 with the least possible delay. G6GS and G6XM kindly supplied the portable transmitters and

G2GG and G2DC the power supplies. Last, but by no means least, we raise our hats to G2PF and G6BU, who cycled from Chichester and the Isle of Wight respectively. Stout work! Owing to the acclaimed success of this field day, and the meeting that followed during the afternoon at the Carfax Hotel, it is hoped to hold more meetings in this part of the area in the future.

A number of members took part in the 56 mc. tests from the Crystal Palace, run by G6QB, and signals were received at Harting, Black Down, Hindhead, Farnborough, Ash and Guildford, to the knowledge of the D.R., and there may, of course, be others who have not yet reported.

Lastly, do not forget our Conventionette. It is the first conventionette of the newly-formed No. 7 District, and it is up to us to make it go with a swing, and the D.R. expects "every man this day, etc." Visitors from other districts will be especially welcome, and are assured of a pleasant day by the Sunny South Coast. See you on June 25.

District 9 Conventionette

Sunday, June 18, 1933

To be held at

PALACE HOTEL, SOUTHEND-ON-SEA
(Facing Pier)

- 10.30 a.m. *Program to be arranged. Station visits, etc.*
- 1.15 p.m. *Reception at Palace Hotel.*
- 1.30 p.m. *Luncheon. Followed by Business Meeting.*
- 4.30 p.m. *Tea.*

DISTRICT 9 (Home Counties).

As it is just possible these lines may be read before the Conventionette takes place at the Palace Hotel (facing Pier), Southend-on-Sea, on Sunday, June 18, at 1.15 p.m., the D.R. takes this last opportunity of inviting all members in the district to attend. BRS and A.A. members will be specially welcomed, as will also lady friends of members.

The few reports to hand have been held over until next month.

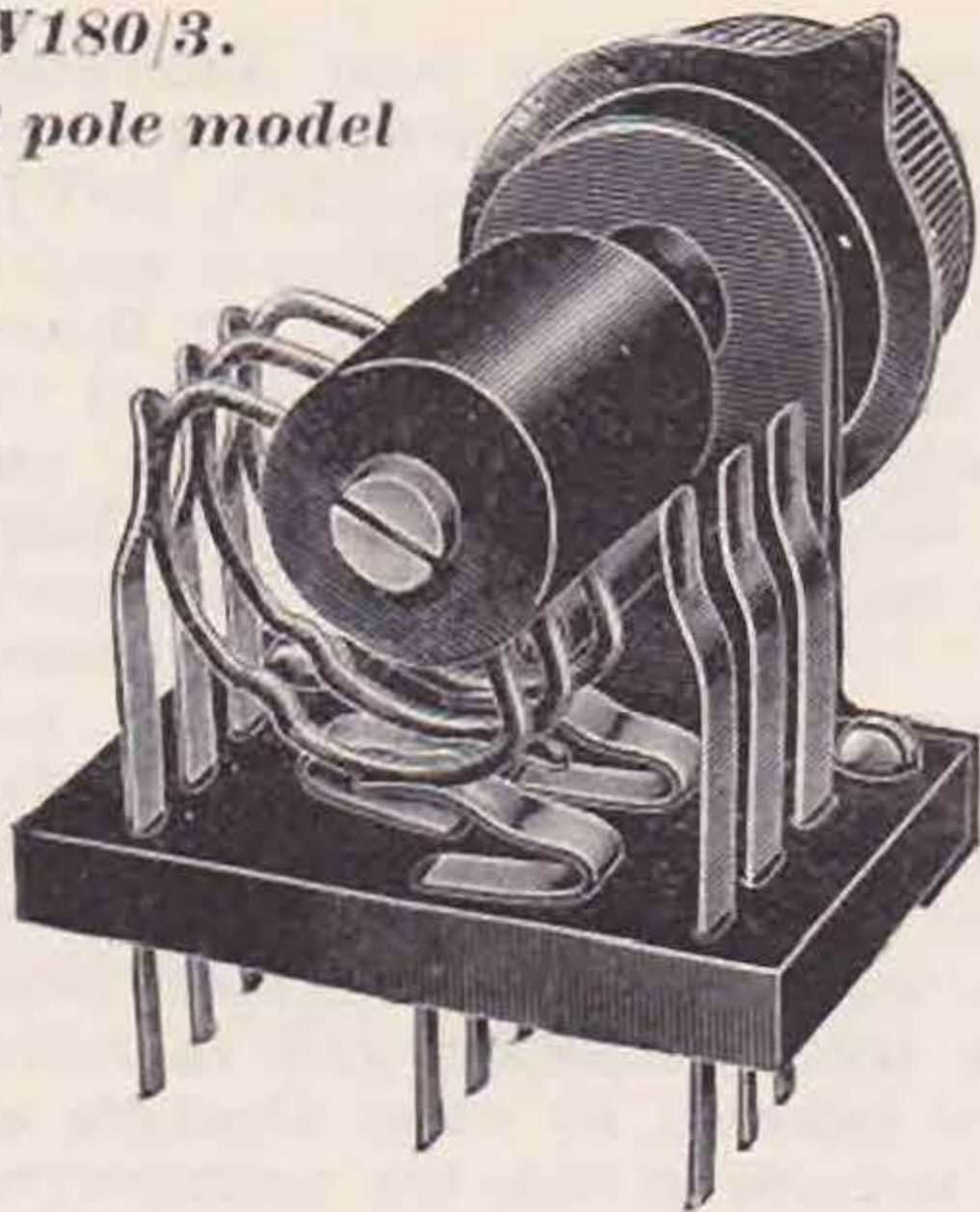
DISTRICT 10 (South Wales and Monmouth).

The activity in the District, which is largely maintained by a proportion of members who are enthusiastic all the year round, shows no diminution with the approach of the summer.

The Swansea report shows that the RSGB members are keeping on the air in spite of the fact that the local S/W Club is only meeting every three weeks. The latter is mourning the death of one of its most promising men, who was killed as the result of a motor-cycle accident. Though he was a non-RSGB member of the Club, I feel sure that we all would wish to express sympathy with his relatives.

With regard to members' work in Swansea, G5PH continues experimenting with his Windom and has also recently started up on 3.5. mc. G5TW

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has his mast up again, and hunts DX on 7 mc., 2AHN and 2BJH are shortly to apply for full licences, while BRS735, President of the Swansea S/W Club, is looking for DX on 2AHN's receiver. We welcome a new member in the Swansea area in BRS1126 of Skewen, who is applying for an A.A. Licence soon.

Further East, G5WU continues his researches into the peculiar behaviour and properties of quartz pebbles, and will shortly be opening up with fifty watts, crystal-controlled. BRS727 is as active as his long working hours permit. G5FI has at last decided to add a P.A. to his C.O. and is also trying to prod 2AKG into activity. G5BI and G6GW appear on 1.75 mc. at week-ends, G5NS is still at sea, and G6PF will be on again as soon as possible.

In Newport, we welcome with congratulations G2JL (ex-2BVB), who, working c.c. at 1911 kc.,

The organisation has recently been completed of the Newport Social Service Radio Club, to which technical assistance is being given by G2PA, G6YJ, BRS1094 and the D.R., with the additional weight of Messrs. Ayliffe (2BPG) and James. At three-weekly intervals, simple lectures are delivered on fundamental principles. G6YJ and 2BPG are taking as their subject "Electricity and Magnetism"; G2PA and G6FO, "Time, Frequency and Wavelength"; BRS1094 and Mr. James, "Radio Components"—thus involving our individual attendance once in three weeks only. This programme allows of variation and reasonably complete treatment of the essentials of radio and will form a basis which can be built upon later on. The work is both interesting and valuable, and might well be followed by other Districts as doing something towards giving the unemployed an interest in life.

BRS497

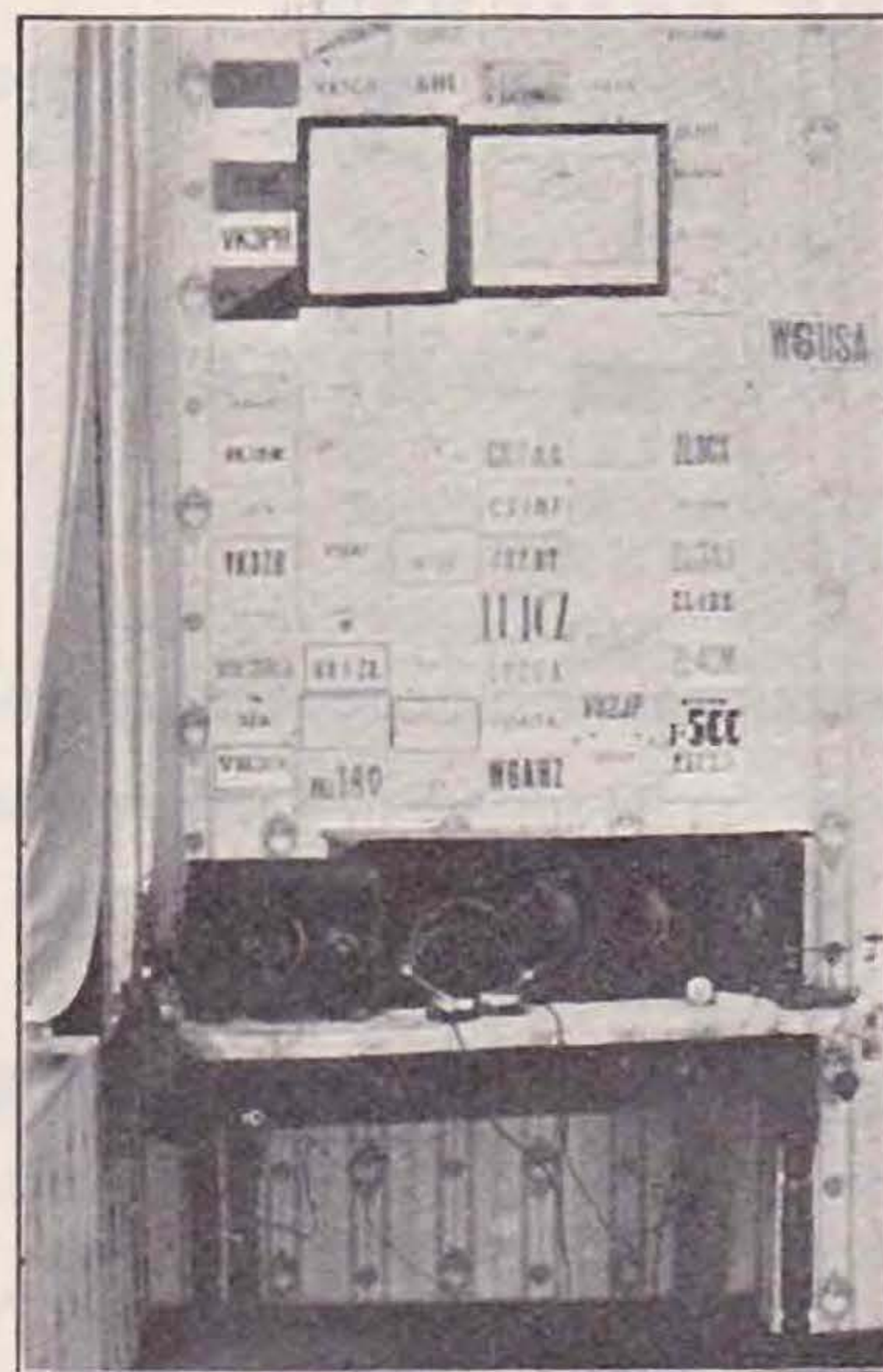
MR. A. T. MATHEWS (BRS497) commenced his amateur activities during 1930 and has since then been endeavouring to find a way of running a transmitter from gas mains!

The short-wave receiver, which is actually an adapter fitted to a B.C.L. set, is shown in the photograph, as is also a mercury relay used for switching H.T. on to the receiver.

BRS497 took part in the 1932 and 1933 B.E.R.U. Reception Contests, and was adjudged the winner of last year's event; he has also been a keen member of C.B. for the past two years, and carried out effective work in connection with the Band Occupancy Checks.

QSL cards from all parts of the world have been received and are fixed to the wall in a novel manner by threading them on to lengths of cotton hung from the picture rail.

The best DX was undoubtedly the reception of the Olympic Games station W6USA, whose 7 mc. harmonic was heard on 14 mc. last summer. The card confirming the reception is shown in the photograph.



makes our sixth local 1.75 mc. station. At the age of sixteen he is putting out a signal of which he may well be proud. G2PA is spending his time in bench work and has his MO-PA operating on 7 mc. G2XX, whom we have back once more after a long absence, is working on 1.75 mc. G6YJ, using a self-excited TPTG on 7 and 14 mc., has worked 23 countries in the comparatively short time he has been on with an input of 5 to 6 watts only. This shows what can be done still with QRP. His best DX is CT2 and TF, and he is now going c.c. with a CO-FD-PA and a 7100 kc. crystal. The DR, in his limited spare time, has been getting the QRO gear at G6FO working and the Field Day apparatus built. BRS550, still down at Portsmouth, has little chance of doing much till he returns home in August or September.

On April 27, a meeting was held in Newport, those present being: G2PA, G5BI, G5WU, G6FO, G6GW, G6PF, G6YJ, BRS1128, BRS1131 and 2BPG (non-member). Much important district business was discussed and settled.

The other Club in the Newport area, the Blackwood Radio Society, continues its excellent work, and now has a new President in Mr. J. Bowen, B.A. Morse instruction classes have been started under Mr. Bryce, who holds a first class P.M.G. certificate, while the Club also possesses an Amateur Band receiver which is giving good results on 1.75 mc. Bad weather, unfortunately, spoiled the plans for a recent field day.

It is regretted that, in spite of all that has been done and written recently, only two contributions have been received for the newly-organised Letter Budget. At least seven members could have said something on the set subject of Crystal Control. Neither have I had all members' crystal frequencies yet. What about that, some of you? QRGs of certified crystals only are required, or those calibrated by either the RSGB or G6PF.

I hope to have a full report on both the Conventionette and our part in the National Field Day in the next issue of the BULLETIN.

DISTRICT 11 (North Wales).

The membership is still increasing in the district. New and old members are invited to send reports for these notes each month.

DISTRICT 12 (London North).

Twenty-four members attended the May meeting at BRS497, when the chief topic was N.F.D. The Junk Sale produced keen bidding and over £7 changed hands. The field day fund benefited to the extent of nearly £2, which, with previous contributions raised the total to £4 17s. The D.R. thanks all who supported his appeal and especially those members who offered apparatus for sale—several of whom gave the full proceeds to the fund. G5SA has recently left us for the "sunny land of DX and anti-punk receivers." During the Crystal Palace Tests he worked G6QB from Wendover, which was the DX QSO of the day. G5MG and G5VY were both QSO the Palace station, the former using 1½ watts, and the latter 8 watts. G5MG was one of the stations heard by G5CV when in the plane.

DISTRICT 13 (London South).

There was insufficient support forthcoming from the district to enable us to operate two stations during the National Field Day. Only five volunteers for operation were found and not a single offer of assistance either for L.T. or H.T. supplies in response to last month's notes.

The Crystal Palace, North Tower 56 mc. tests went through very successfully and the station was jointly operated by G6QB, G6HP and G6NF, using the latter's transmitting gear. Ten watts to a pair of B12 valves sufficed to bring in reports from over 50 receiving stations, and in one case a report was received from over 200 miles. G5CV received our signals R9+, 130 miles away in an aeroplane 10,000 ft. above the North Sea. We spent 9 hours together in this tower. G6HP negotiated an extra 800 steps during the morning to go home and fetch another pair of headphones because, unfortunately, the lift is not working on Sundays! We were visited by Mr. Gilmour (2BKT), two telegraph boys and a Press photographer!

DISTRICT 14 (London, East).

The May district meeting was well attended, when Field Day arrangements were the chief topic of discussion. Tentative arrangements are in hand to run a joint Field Day in collaboration with members of the N.V.I.R. (Holland). It is hoped the Dutch party will come to England some time during July. G6FY is to attend a Field Day, arranged by the N.V.I.R. at Eindhoven, when he will also exhibit the District 14 film.

Congratulations are extended to BRS1086, who is now 2APS. G6QK is off for a sea trip, taking with him short-wave receiving gear; he hopes to visit Danish and Norwegian stations.

The next district meeting will be held at 7.30 p.m. on Tuesday, June 27, at 28, Douglas Road, Chingford.

DISTRICT 15 (London West and Middlesex).

One of the best attended meetings for some months was held on May 18. The final arrangements for the N.F.D. were made, and it was decided that this should take the place of the usual meeting for June; furthermore, owing to holidays and

Convention there will not be meetings during either July or August.

The next meeting will be held during September, and the date and venue will be announced in the BULLETIN later.

May I take this opportunity of wishing all those about to take a vacation, all the best of weather and a jolly time, and a return to radio afterwards with renewed vigour.

Only three reports have come to hand this month. G6VP has been working W, VP2 and VE on telephony and getting good reports, one from a W2 of R9. BRS642 has changed to an O.V.1, and finds it better for weaker signals than his old three valver. He finds conditions on 3.5 mc. not so good now, and has been listening to DX on 14mc. Congratulations to BRS1051, who is now 2AOJ.

Although G5CV has not reported this month, I have seen reports of his activities in the national press, and he is to be congratulated on his very fine effort to solve some of the problems of 56 mc. He was instrumental in receiving signals from G6QB at a distance of 130 miles, in an aeroplane over the North Sea. This is, I think, the first time a plane has been used by amateurs in this country for experimental purposes. It is very gratifying to hear that a member of this district has led this effort.

DISTRICT 16 (South-Eastern).

Our chief event of the year—the District Conventionette held at Maidstone on May 21—was completely ruined, due almost entirely to the fact that the 56 mc. tests at the Crystal Palace drew away upwards of 50 members who have in previous years supported these Conventionettes. Recriminations are of little use now, but it is felt that members in the District should have supported their own show. Not one member from Sussex was present and the total for lunch was *exactly* 17. This number was slightly increased during the afternoon, when a small group of Gillingham members arrived. Thanks to their generosity in paying for lunches they did not have, the D.R. was able to extricate himself from a difficult position, as accommodation had been booked for 60.

The business meeting was dispensed with except for a short talk on district affairs after tea. Several members spent the afternoon on the North Downs with 56 mc. apparatus, when Mr. Hamman's portable equipment aroused keen interest.

Stray.

Lieut. E. S. Cole, better known to us as SU1EC, is now home in England on leave until September; during his absence, Mr. I. Hill (SU6HL) will act as our representative in Egypt.

Mr. Cole asks us to mention that he was unable to answer the multitude of BRS and other non-transmitting QSL cards which reached him during last spring. He reiterates the views expressed in our recent editorial under the title "Intelligent reporting," and asks "What value is there in a report from a BRS who has heard me in QSO with another British amateur?"

Empire



News.

B.E.R.U. REPRESENTATIVES.

Australia.—H. R. Carter (VK2HC), Yarraman North, Quirindi, N.S.W.

Bahamas, Bermuda and the Eastern Part of the West Indies.—H. B. Trasler, No. 2 Mess, Pointe à Pierre, Trinidad, B.W.I.

Burma.—W. G. F. Wedderspoon (VU2JB), Government High School, Akyab, Burma.

Canada.—C. J. Dawes (VE2BB), Main Street, St. Anne de Bellevue, Quebec; and A. E. Howard (VE4CJ), 2401, 25th St. West, Calgary, Alberta.

Ceylon and South India.—G. Todd (VS7GT), District Engineers Bungalow, Nuwara Eliya, Ceylon.

Channel Islands.—H. J. Ahier (G5OU), Lansdowne House, 45a, Colomberie, St. Helier, Jersey, C.I.

Egypt and Sudan.—E. S. Cole (SU1EC), Haking House, Abbassia, Cairo, Egypt.

Hong Kong.—P. J. O'Brien (VS6AE), 12, Kent Road, Kowloon Tong, Hong Kong.

Iraq.—S. A. Rance (YI2DS), A Bungalow, 203 Squadron, R.A.F., Basra.

Irish Free State.—Col. M. J. C. Dennis (EI2B), Fortgranite, Baltinglass, Co. Wicklow.

Jamaica, British Honduras, Turks Island and Cayman Island.—C. M. Lyons, (VP5MK), 68½, King Street, Kingston, Jamaica, B.W.I.

Kenya, Uganda and Tanganyika.—W. E. Lane (VQ4CRH), Box 570, Nairobi, Kenya Colony.

Malaya.—T. G. Laver (VS3AC), Government Electrical Power Station, Johore Bharu, Johore, Malaya.

Newfoundland.—James Moore (VO8AW), Carbonear.

New Zealand.—D. W. Buchanan (ZL3AR), 74, Willis Street, Ashburton; and C. W. Parton (ZL3CP), 69, Hackthorne Road, Cashmere Hills, Christchurch.

Nigeria.—Capt. G. C. Wilmot (ZD2A), Depot Nigeria Regt., Zaria, Nigeria.

North India.—T. C. Pratley (VU2AH), Aircraft Depot, Drigh Road, Sind.

South Africa.—W. H. Heathcote (ZT6X), 3, North Avenue, Bezuidenhout Valley, Johannesburg.

Australia.

By VK2HC.

The information contained in Mr. Carter's notes covering the period March and April is now considerably out of date, and therefore we do not feel justified in reproducing it, as it refers in the main to conditions which applied in Australia some three months ago. Mr. Carter advises us that the W.I.A. Headquarters are now in Adelaide, with VK5BP President, VK5BY Vice-President, and VK5BO Secretary.

Egypt.

By SU1EC.

Conditions on 14 mc. were very good during May as far as Western DX was concerned, but Eastern stations were conspicuous by their absence. QRN was heavy at all times. SU6HL found similar conditions prevailing in the Sudan. Several good 'phone QSO's with G were effected by SU1EC and 6HL. The former used 55 watts (grid modulation) and the latter 35 watts (Heising modulation). SU1EC was using a "G2BI type aerial" and noted greatly improved results on 14 mc. with long feeders and shortened top. SU1SG at Alexandria will shortly be using C.C. SU1EC will be on leave until August; SU6HL will take over as Acting B.E.R.U. Representative.

Iraq.

By YI2DS.

The hot weather has restricted activity recently, with the result that YI2DS has been practically inactive. A new transmitter has been built, and it is hoped to maintain regular E.L.S. schedules. YI7RH, of Basra, is a new call and a new B.E.R.U.

member. YI6WG is now at Hinaidi, where he is expected to run a station with the new operator at YI2FU. Steps are being taken to collect activity reports from Northern Iraq and the Persian Gulf.

Irish Free State.

By EI2B.

During May, there was considerable activity amongst EI stations on the 14 mc. band, where conditions were reported as much improved. Outstanding DX has been worked by both EI6F and EI8B. EI2B, after having worked almost exclusively on 3.5 mc. for some months, went up to 14 mc. and also found an improvement, but with all due respects to "Uncle Tom" conditions have again deteriorated and many QSO's have been spoilt by bad fading, which cannot be accounted for by a "punk" receiver. EI8B made a very good score in the A.R.R.L. tests, but nearly half of his total was disallowed because two operators had been employed. Commandant J. Smyth, of the Free State Army, has been nominated as the new I.R.T.S. President.

Jamaica.

By VP5MK.

Conditions during April on the 14 mc. band were very unstable, fading being particularly pronounced. G5ML, G5NF, G5VL, G5BJ and G6VP were the most consistent G stations heard. VP5NH, who worked G5NF recently for three-quarters of an hour, is using a new Boyce power pack. VP5NK is building a power filter to enable him to modulate a pair of 50-watt tubes for use at the forthcoming Radio Exhibition to be held in Jamaica. It is hoped to obtain permission from the

Government to erect a Broadcasting station at the Exhibition.

Newfoundland.

From VO8AW (via G6XB).

There has been little activity here recently, a few G's have been heard and worked on 14 mc., whilst VO8Z continues a daily schedule with VO8W. Some new stations have started up on 3.5 mc., including VO8D, who is using low power. VO8K is heard occasionally. The Loyal Greeting to H.R.H. has been despatched *via* radio.

New Zealand.

Via ZL4AO and G2ZQ.

The writer cannot give a very comprehensive report on New Zealand activities at present, but hopes to obtain more information in future from Headquarters. The number of licensed amateurs in New Zealand has now topped the 700 mark.

The N.Z.A.R.T. is arranging a 2 mc. contest in June to raise more interest in this hitherto neglected band. 3.5 mc., which is always crowded in the evenings, is becoming slightly erratic with skip effects. Much DX is being worked on 7 mc., but 14 mc. is still very poor.

Keen interest is being shown in 56 mc. work. The Wellington section of the R.E.C. put in some good work when a party of trampers were lost for a fortnight in the Tararua range. A portable station was established at the M.T. Holdsworth hut to keep the searchers in touch with the main towns, their bases. The same section also went to Ninety Mile Beach, where the *Southern Cross* was to leave for the return Trans Tasman flight and kept Sir Charles Kingsford Smith supplied with weather reports from both sides of the Tasman.

Northern India.

By VU2LJ.

During April conditions on 14 mc. improved considerably, and many G stations were heard at good strength after 15.00 G.M.T. Japanese stations were also received, but no VK's were audible. Generally speaking, Eastern DX was poor. Excessive static made the 7 mc. band unusable. Interest in Northern India seems to be increasing, at one period on April 17, seven different VU stations were heard working. VU2AH is still inactive, owing to service duties, but hopes to be on the air again shortly under his new call, VU2AT.

Transjordania.

By ZC6KR, via SU1EC and G5BJ.

During May conditions on 14 mc. were very variable, and few signals heard before 15.00 G.M.T., and none full strength until 17.00 G.M.T. No work has been done on 28 mc. ZC6N has been active with an input of 9 watts on 14 mc., ZC6KR has rebuilt a new T.P.T.G. transmitter, which is working into a Zepp-Hertz aerial; he will be in Egypt shortly and back in England towards the end of the year. ZC1S is at present inactive.

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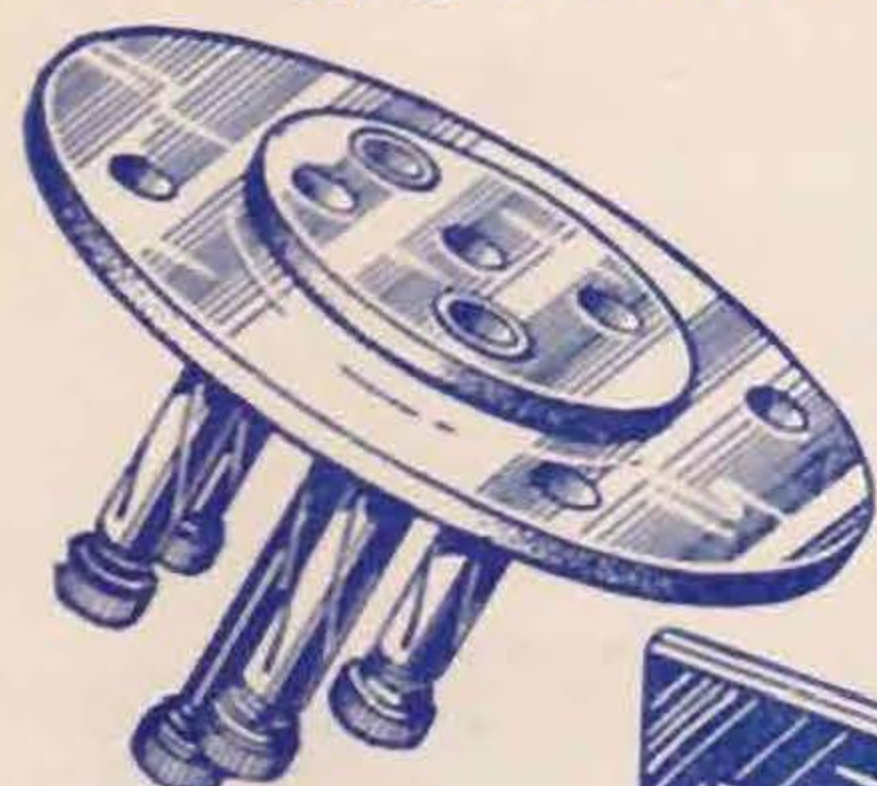
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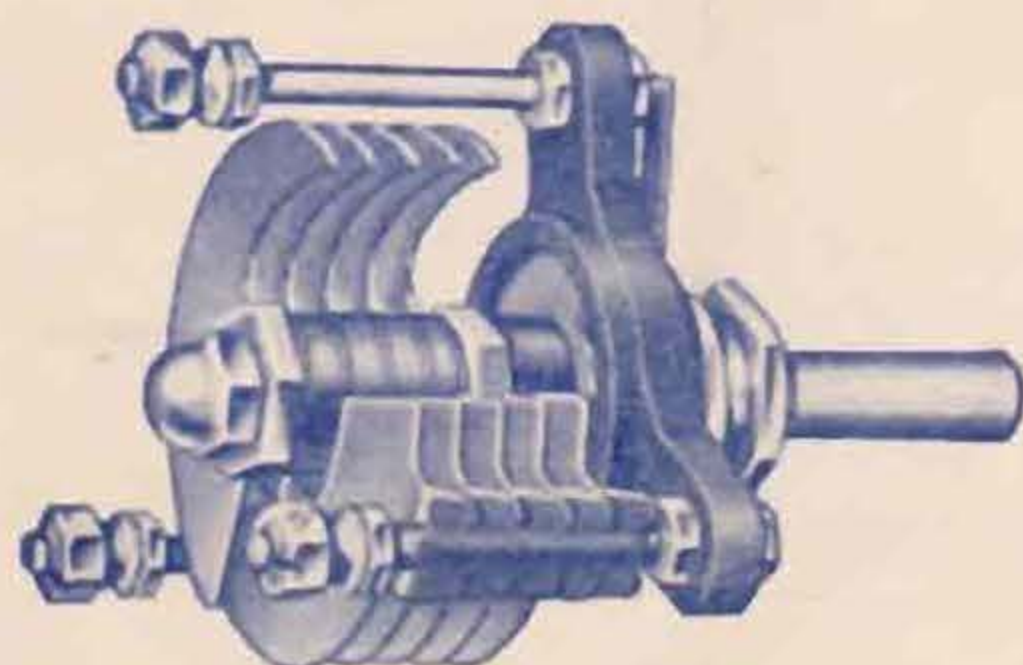
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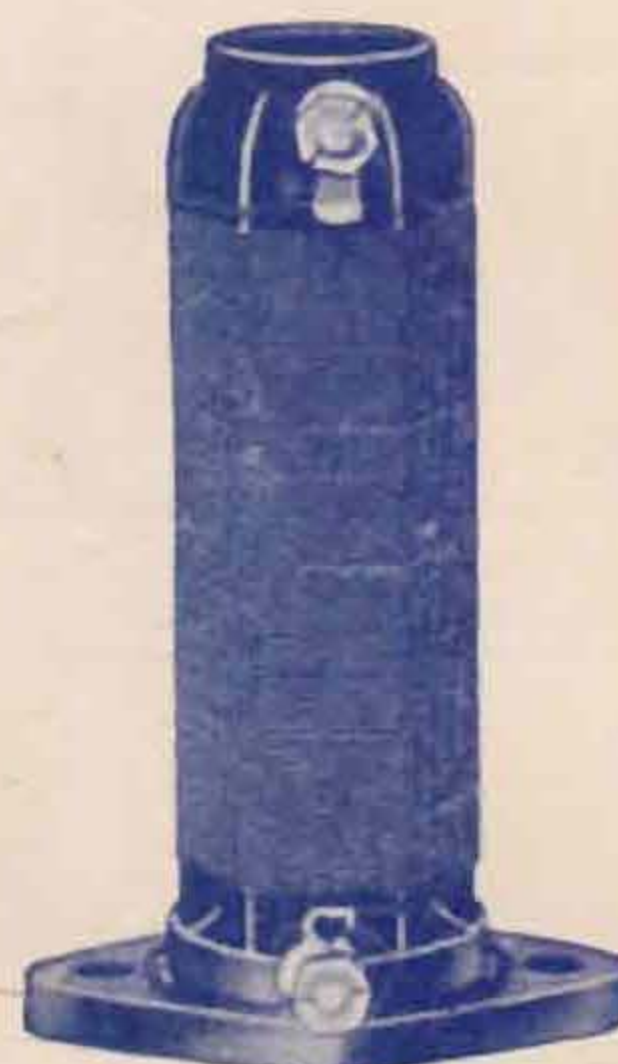
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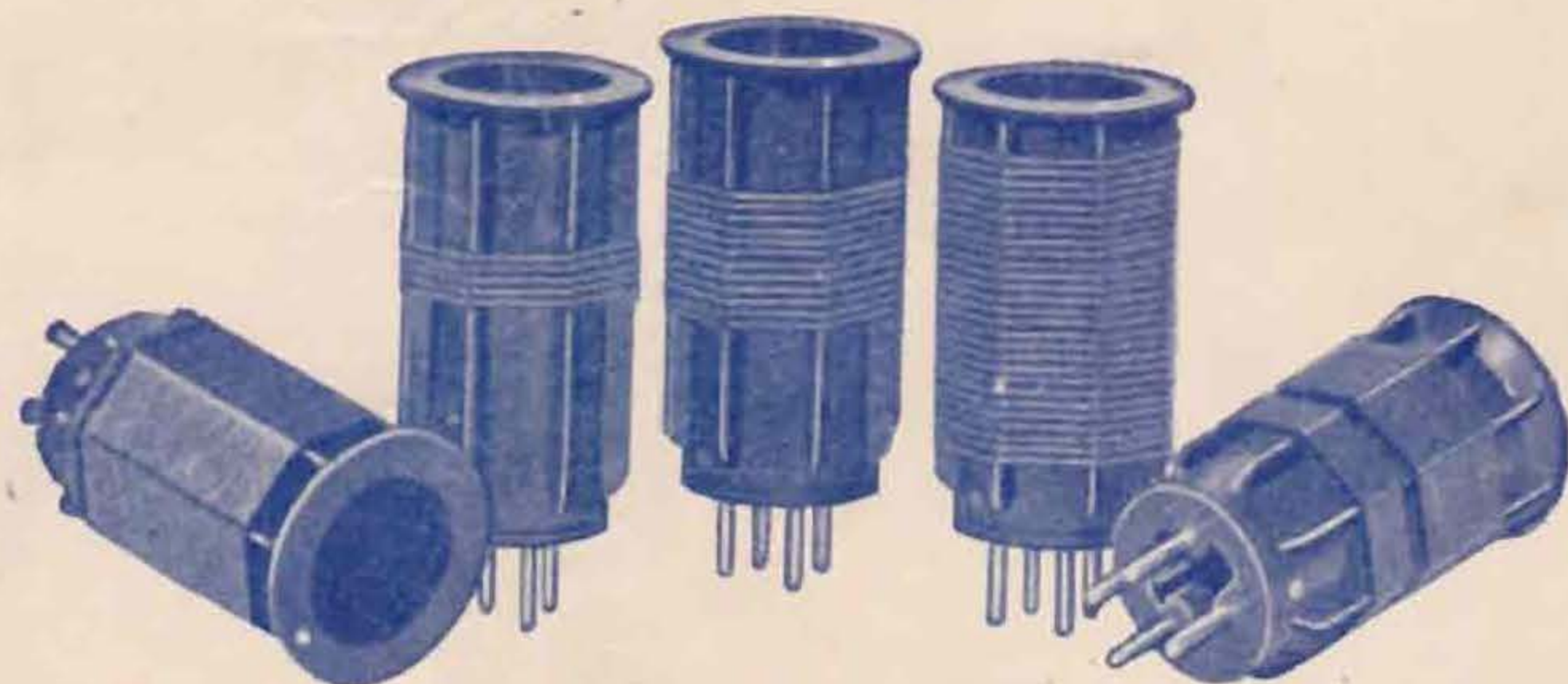
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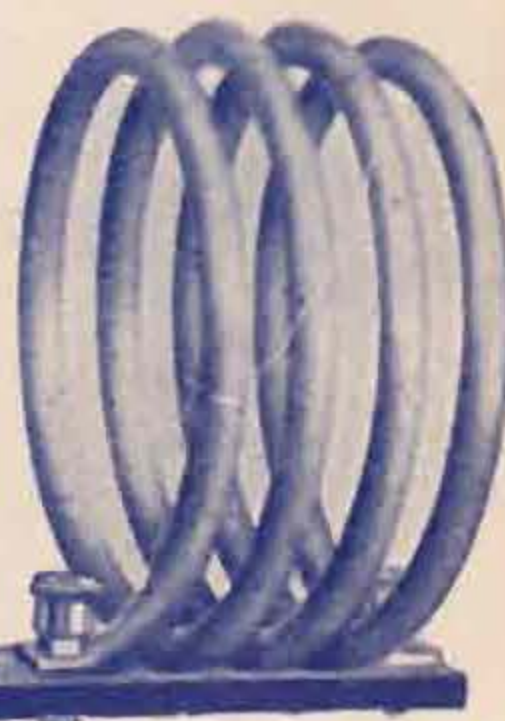
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