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CONTENTS.

LOOKING AHEAD

WE begin this, our tenth year of publication, with a good deal of enthusiasm, for after the celebration of our coming-of-age, which, incidentally, brought the Society hosts of congratulations, we can take pleasure in the fact that the R.S.G.B. is looked up to by all who have knowledge of our work.

We have often emphasized that the future success of the amateur movement rests upon the shoulders of each individual worker. We would go even farther, and suggest that the radio industry depends to quite a large extent for its future upon the amateurs of the world. In no other branch of engineering have amateurs such a wide field for research and experiment, and it is safe to assume that with an international increase in interest the chances of new developments falling to our lot are greatly enhanced.

We are convinced that within the next decade revolutionary changes in connection with the production of high-frequency oscillations will take place, and although the discoveries *may* emanate from commercial laboratories, we are of the opinion that amateurs have every opportunity of getting in first. The progress of television, too, is dependent almost entirely upon the success achieved with ultra-short-wave transmitters, and the useful work already effected by amateurs at home and abroad is, undoubtedly, being most carefully watched by commercial concerns.

Design work in connection with ultra-short-wave aerials has been attracting our attention in recent years, and here again we believe the amateur has just as good a chance as his professional colleague in devising devices which will enable full and effective use to be made of these frequencies.

The present-day receiver as used by the majority of 56 mc. enthusiasts is entirely unsuitable, and although attempts have been made to improve matters by the use of super-hets, we consider that the real solution lies in the employment of a device which will take the place of the thermionic valve. Our transmitters, too, are prehistoric, if one may be permitted to use such a term, and no real progress will be possible until constant frequency signals can be transmitted. Crystal control has been employed by certain amateurs with varying success, but valve troubles seem to be responsible for the inefficiency of our transmissions on these frequencies.

We are anxious to see more interest being taken in micro-wave work; commercial concerns are regularly covering distances up to 25 miles on wavelengths well below a metre, and we see no reason why amateurs should be compelled to play second fiddle.

During Convention a nation-wide attempt will be made to establish reliable communication on 56 mc. This should not only prove an enjoyable field event, but, providing all participants

(*Continued on page* 46)

SIMPLIFYING THE RECEIVER

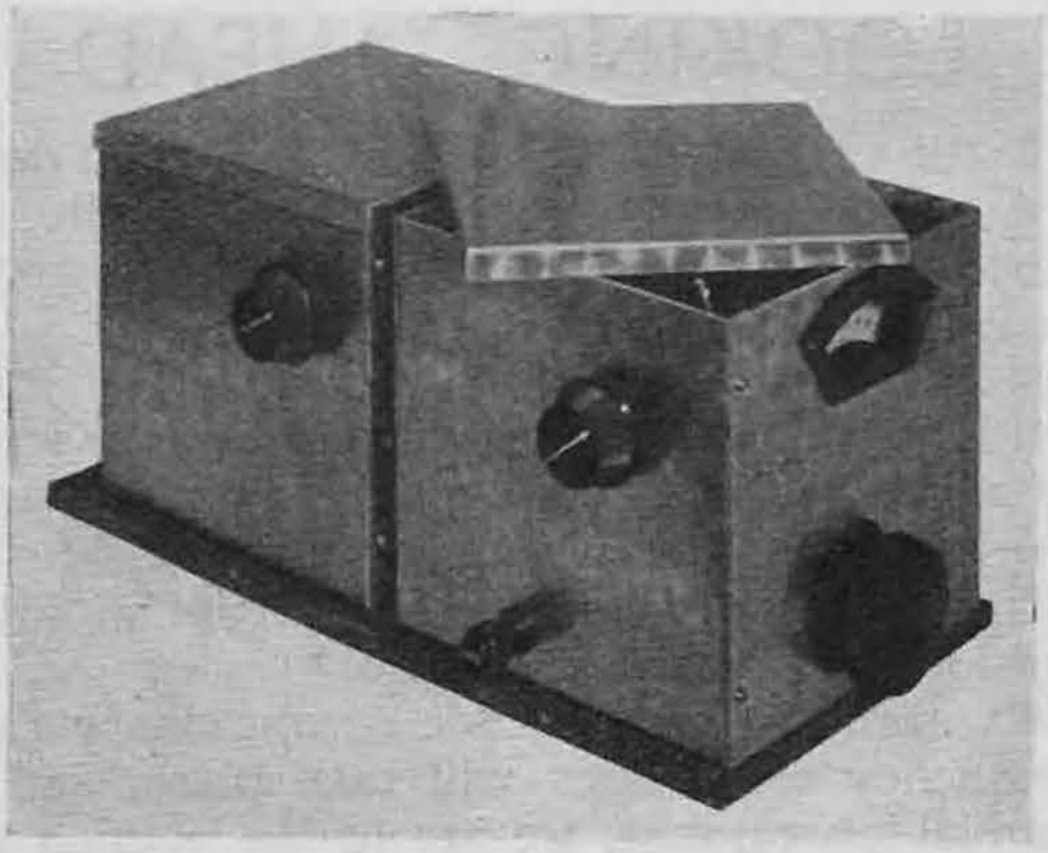
By L. H. Thomas (G6QB).

THE writer has always had a hatred of unnecessary complication, especially in matters concerning amateur radio. Simplicity is a virtue unless it is overdone; but even when it *is* overdone, it seems preferable to the other extreme of unnecessary complication.

This article is not an attempt to decry the merits of such proved receivers as the single-signal superhet, but is offered to those readers who also have a sneaking regard for simplicity, in the hope that the receiver described may be useful to them.

Our learned colleague " Uncle Tom " never tires of saying that the worst thing in the average amateur station is the receiver. Without going as far as this, it might be said with a certain amount of truth that most of such receivers could be vastly improved if the owners would spend a little more time working on them, and a little less calling " Test." In the writer's experience, the chief trouble with the receiver in an amateur station is that it is *forgotten*. Alterations are made, haywire fashion, and left haywire. Inches of dust accumulate, and are left there.

The more complicated the scheme of the receiver, the worse is the effect of such neglect. Accordingly the writer set out to make a receiver that was (*a*) simple; (*b*) dustproof; (*c*) moderately rigid in construction.



The complete Receiver ready for use.

General Design Features.

Two valves are used, a screened-grid stage, fully tuned, and a triode detector. Band-spreading has been provided for, single-dial tuning has been arranged, and the receiver does definitely represent a genuine attempt to escape from the reaction control. So successful has it been in this respect that the latter has been placed in an inaccessible position at the rear of the set!

It is impossible for anyone to choose any particular circuit without being criticised for not using something else; so no attempt will be made to justify the use of a triode detector except by saying that the designer prefers it to others. It is more convenient for use in a set of this type, which ends with the detector, since 'phones may be directly wired in its plate circuit if it is not desired to couple it to an amplifier.

In any case, most of those who read this article will probably have sufficient technical knowledge to convert the set to a screened-grid detector if they so wish.

The chief point in using a high-frequency stage seems to be that it cures all sorts of annoying little troubles that one is apt to encounter if the detector is directly coupled to the aerial. " Dead spots," erratic reaction control, and even hand-capacity troubles are looked after by the S.G. stage. If, as an afterthought, it gives us a little amplification as well, so much the better.

In this case it definitely does. The aerial is loosely coupled to the first valve, in order not to flatten out the tuning, and there has been no difficulty in ganging the two small condensers that cover the amateur bands.

Band-setting is effected by a pair of 150 mmf. condensers mounted on the sides of the boxes, so that the short-wave broadcast bands may be covered as well.

It will probably be advisable to deal with all design points by discussing the circuit diagram from aerial to output terminals. The two inductances, L1 L2, and L3 L4, are standard *Eddystone* four-pin coils. In the case of the first the reaction winding is used as an aerial coupling coil. C1 and C5, the 25 mmf. condensers, are ganged, C2 and C6, the band-setters, being separate.

It should be noted that nothing appertaining to the anode circuit of the screened-grid valve has been allowed to remain in the first box. The result is complete stability, and the new *Mullard* H.F. pentode (S.P.4) has been used in this stage with complete success.

The S.G. valve is parallel-fed, coupling to the detector grid coil being effected by a neutralising condenser C4. The detector circuit itself is absolutely " straight "—series feed and throttle-controlled reaction. The only point worthy of note is that there are two H.F. chokes, both in the same compartment, and it was found inadvisable to use two of the same make.

Although battery valves are shown in the circuit diagram (Fig. 1), five-pin valve holders have been used in the set, the cathode legs being connected to the L.T. side in each case. The set is not intended for use on A.C., but those who have good size accumulators that require some use to keep them in order will find it worth their while to use indirectly heated valves for one position, or possibly both. For this reason the detector grid-leak has been connected across the grid condenser, and the bottom of the coil returned to L.T.—. This works

out very well when using an indirectly heated valve, but the writer was a little dubious about its efficiency when battery valves were used. Contrary to expectations, however, it was found that modern valves behaved quite well with the grid-leak returned to the negative end of the filament. Reaction control is better than with a positive return, and sensitivity does not appear to suffer.

This, again, is a matter of personal preference, and a small alteration can easily be made if necessary.

A fellow amateur, looking over the set when it was on test, remarked that this article should be

idea of the layout inside the boxes. The photograph makes it appear that the detector compartment is a little crowded, but actually there is ample space round the coil, which is of small diameter.

Apart from the variable condenser itself, which is inevitable, there is nothing at H.F. potential close to the front of the receiver. Hand-capacity effects are, in fact, absolutely non-existent, even on 28 mc., which was covered with a pair of home-wound coils. It is therefore advised that the layout adopted should not be radically changed.

The designer will probably be criticised for not using a wave-change switching scheme, but in reply he would state that unless one uses a really

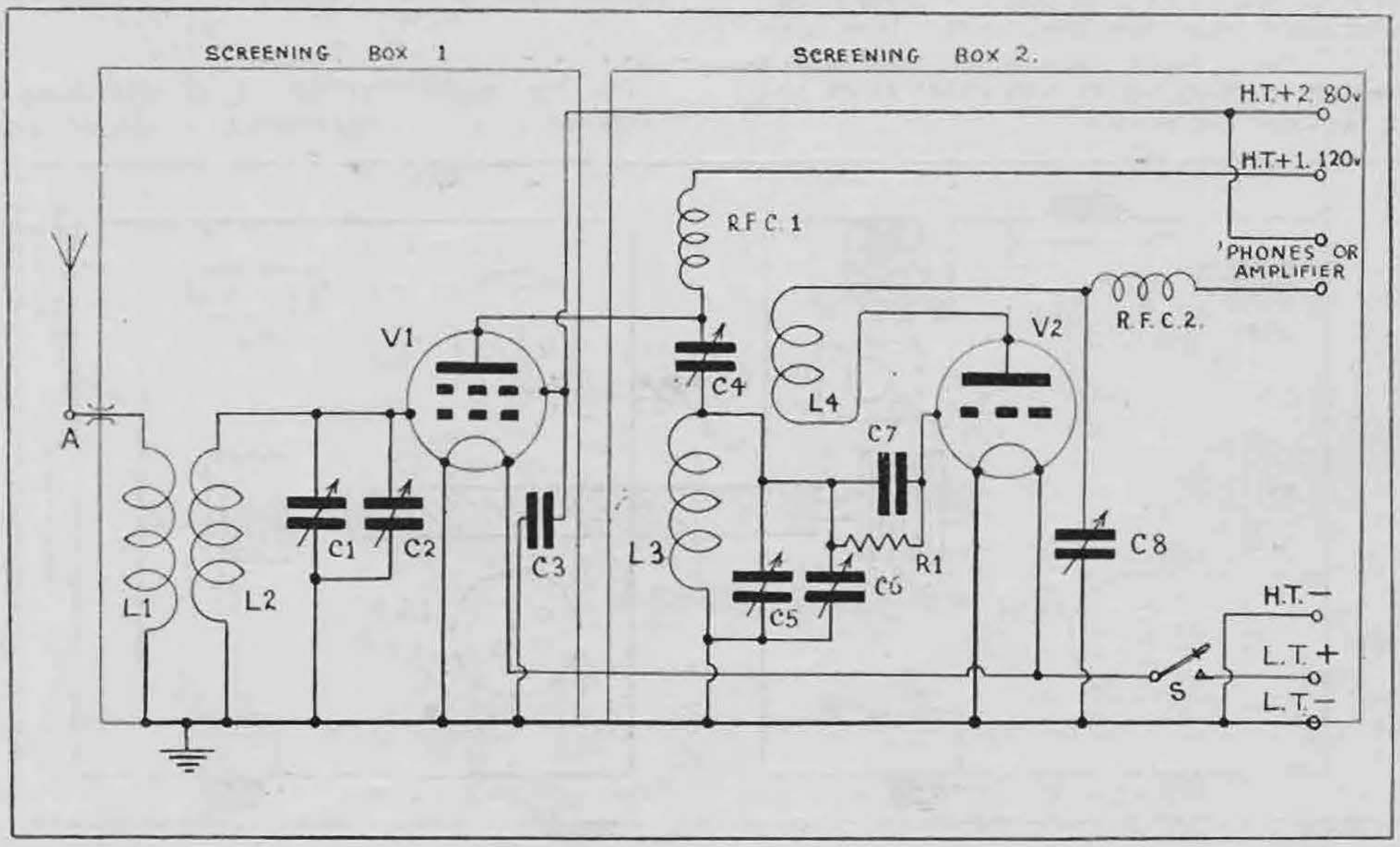


Fig. 1.

CIRCUIT OF TWO-VALVE RECEIVER.

C1 and C5: 25 mmf. band-spread condensers, ganged (Eddystone).
C2 and C6: 150 mmf. band-setting condensers (Eddystone).
C3: 2 mf. paper condenser (Dubilier).
C4: Neutralising condenser (Jackson Bros.).
C7: .0001 mica condenser (T.C.C.).
C8: .0001 solid dielectric reaction condenser (Polar).
L1, L2: Four-pin short-wave coil, with four-pin socket (Eddystone).
L3, L4 Ditto.
R.F.C.1: Short-wave H.F. choke (Bulgin).
R.F.C.2: Short-wave H.F. choke (Peto-Scott).
R1: 3-megohm grid-leak (Dubilier 1-watt).
S: Q.M.B. L.T. switch (Bulgin).
Screening boxes: 6½-in. cubes, aluminium (Paroussi).

Other components not shown in diagram:—

One standard slow-motion disc drive (Eddystone).
Ganging assembly with 4-in. extension handle (Eddystone).
Two short-wave type valveholders (Eddystone).
Terminals labelled, Aerial, L.T.+ and —, H.T.+1 +2 and —, Phones + and —.

Valves, see text.

one long apology for being so un-original! It is nothing of the sort. There seems to be a craze for originality for originality's sake, even if the results do not justify it. In this case the behaviour of the receiver amply justifies the use of a straight circuit.

Constructional Features.

Now for some remarks on the constructional side. It was found convenient to use two standard 6½ in. cube screening boxes, mounted on a wooden baseboard with a small air-gap. The screening obtained is very efficient, and Fig. 2 gives a rough

comprehensive scheme, such as that described by Mr. G. Exeter, G6YK, in the BULLETIN for October and November, 1933, it is better to use nothing at all. Wave-change arrangements depending upon multi-pole switches and dead-ends should be avoided like the plague.

In any case the necessity for quick changes from one band to another are apt to be exaggerated. Except on an occasion like N.F.D. an amateur generally settles down on one particular band; when it fades out he will change bands, certainly, but he will probably find no need to return to those frequencies again for some hours.

No L.F. Stage.

No apology is made for the omission of an L.F. stage as the writer maintains that a good H.F. and detector set, or even a good detector alone, gives sufficient headphone strength for amateur-band work, providing one does not use cheap 'phones that have been knocked about all their life. In any case, the standard equipment at a good amateur station should include an L.F. amplifier of some sort, which can always be pressed into service when necessary.

The writer has never found, using a detector only, that the trouble in receiving weak signals is in any way due to their weakness, it is always the " signal-mush " ratio that prevents reception. Even the A.R.R.L., with their high stage of development on the technical side, admitted in the June issue of " Q.S.T." that " signal-background ratio with a detector only is probably as favourable as on any receiver that one can devise."

C4, the neutralising condenser coupling the S.G. stage to the detector, may usually be left about half way in, and should not require adjustment. Mark the settings of the band-setting condensers. Good knobs of the " arrow " type should be used, and quite satisfactory readings may be obtained by scratching the panel with a scriber. Repeat the proceeding of band-setting for the 7 mc. and 3.5 mc. bands. The coils and other components are sufficiently rigid to ensure that these settings will hold good and will not need re-checking.

With the original receiver it was found unnecessary to touch the reaction control throughout the bands, except when changing suddenly from C.W. to 'phone reception. Even then the writer preferred the reaction control at the side of the receiver.

Valves.

On the subject of valves, it will have been gathered that the requirements of the receiver are somewhat flexible. Those who have 2 amps. of L.T. to spare will find a *Mullard* S.P.4. and 904 V excellent, and these were used on the original tests of the receiver. Subsequently, practically every combination of valves was tried, and results with a standard 2-volt battery S.G. valve and a 2-volt " H.L." type were practically as good as those obtained with the indirectly heated variety.

A compromise, for those who have 4 volts available but do not want to use much more than 1 amp., may be arrived at by the use of a 904 V or AC/2HL as detector, with the standard battery-type 4 volt S.G.

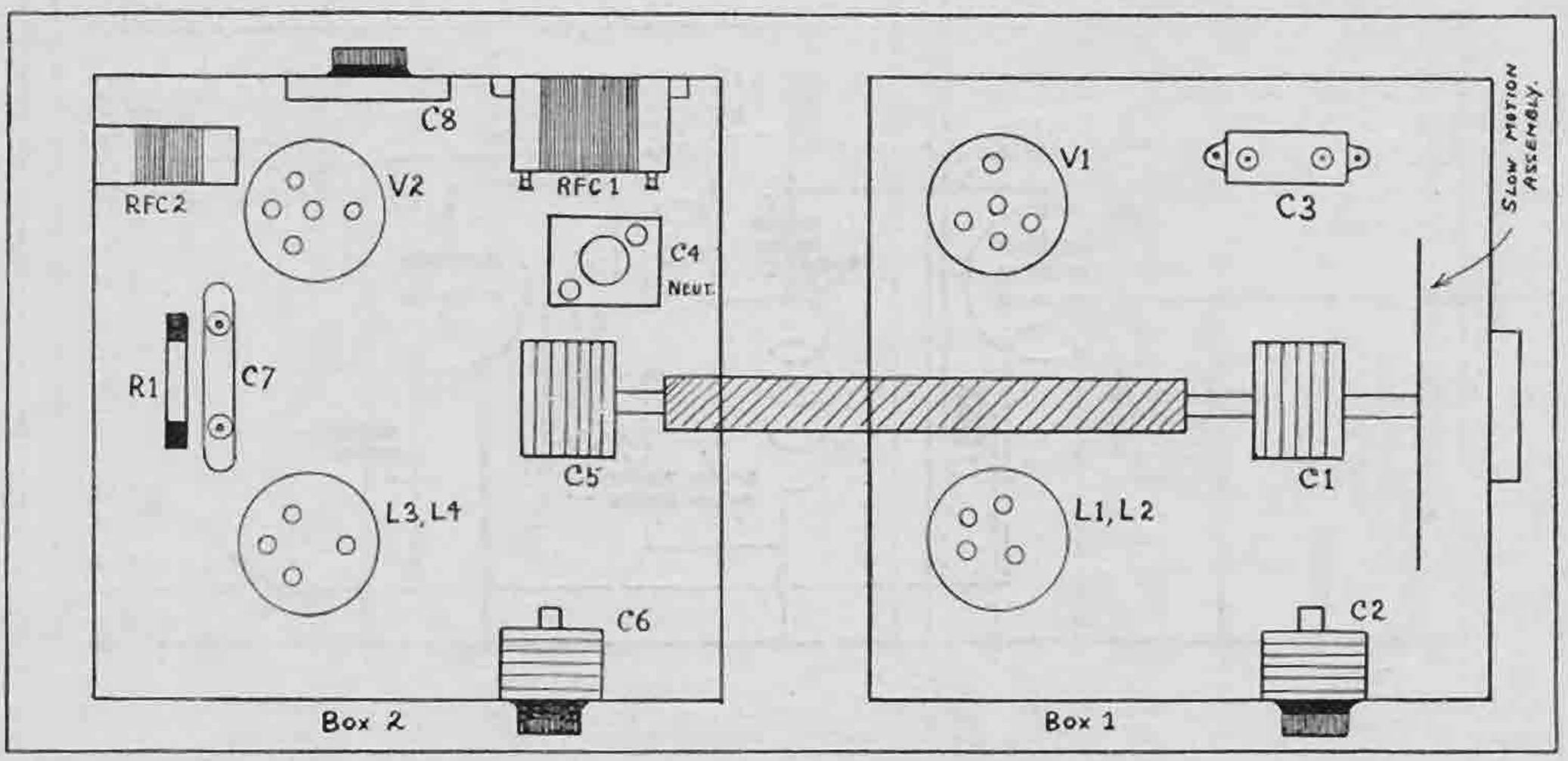


Fig. 2.
Lay-out of components in screening boxes.

It seems that a single-signal superhet is likely to prove invaluable to the country-dweller who really can read weak signals; probably it is infinitely preferable to such a receiver as this, even for the town-dweller. However, this Rolls-Royce of receivers is beyond the reach of many of us, and we derive a certain pleasure out of making the best of simple equipment.

Operation.

There is not much to be said on the subject of operation, except in relation to the band-setting. The band-setting condenser C6 in the detector compartment should be adjusted first, until one of the " marker " stations that are always with us is heard. To tune the set to the 14 mc. band the procedure is as follows: with the main tuning control set so that the small condensers are nearly " all-in," turn C6 until JNJ is heard, just beyond the low-frequency end of the 14 mc. band, then adjust the other band-setting condenser C5 until its strength reaches a maximum.

Under these conditions the set should be accurately ganged, but tune down through the 14 mc. band and try slight readjustments of C5 *only*.

H.T. Voltages.

The only other point to cover is the question of H.T. voltages. The detector has been arranged on the same tap as the screen of the S.G. valve, and both require a value between 60 and 80 volts. The S.G. likes a full 120 on its anode, but 100 is sufficient for ordinary purposes.

A small constructional point—when wiring-up do not forget to connect the two boxes together! Only three leads go through from the front to the rear compartment—L.T. positive, H.T. to screen, and anode lead.

See this Receiver at Olympia

A 10-WATT C.W. AND TELEPHONY TRANSMITTER.

By A. E. Livesey (D.F.H.), G6LI.

PART II.

The General Mode of Construction.

THE initial work connected with the construction is the shaping and fixing of the ten panels which form the chassis of the finished unit. Essentially, the transmitter is divided into two distinct parts—the radio frequency and the power supply boxes.

The Power Supply Box and Panels.

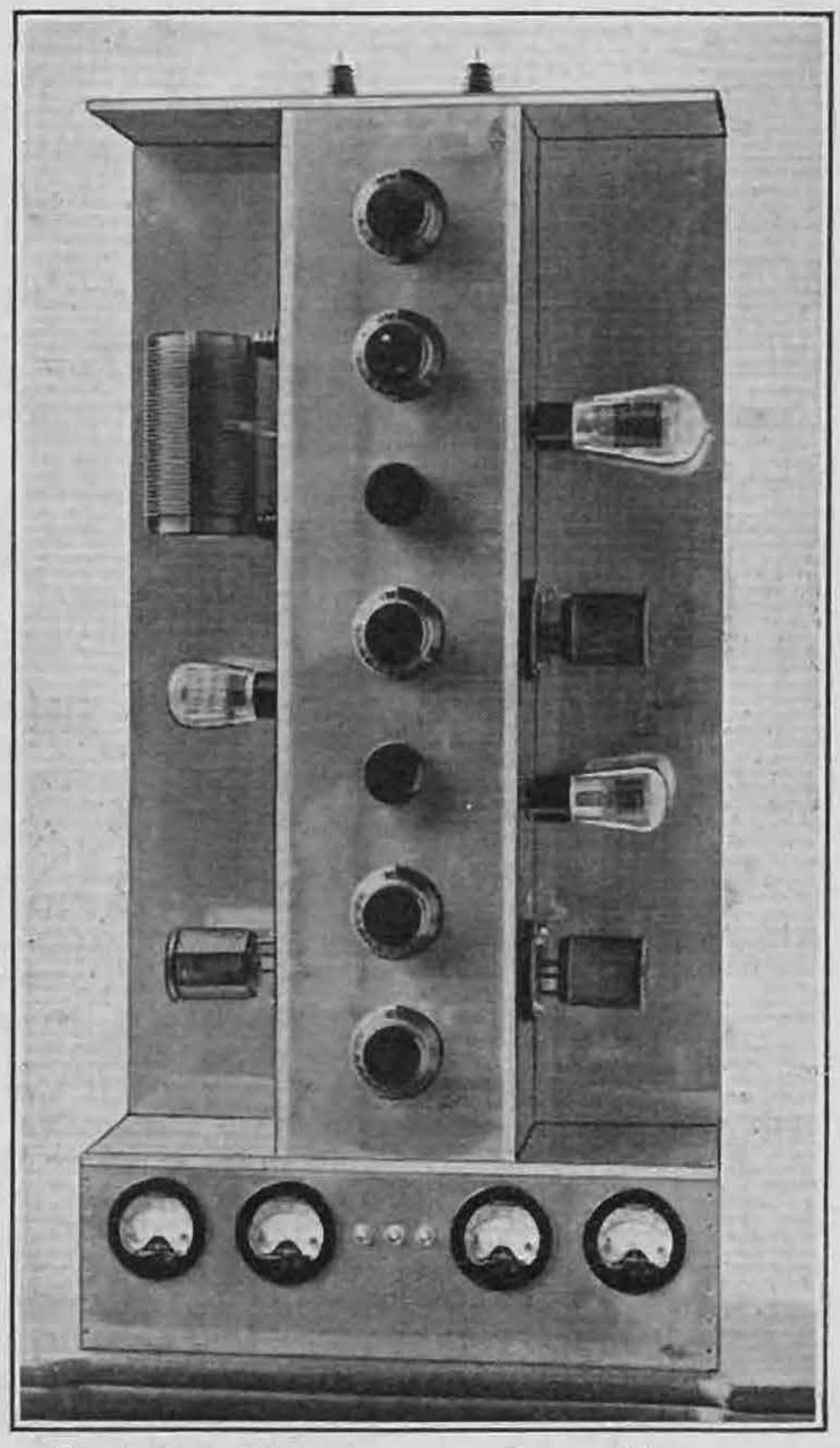
This consists of the front panel for the meters and three switches, the base-board on to which is screwed the radio frequency box, and the two sides. The dimensions of the original are as follows:—

Overall length of front, 20¾ ins.; height, 6 ins.; depth, 7 ins.

The box has no back at this stage, and the only work to be done is the cutting of the holes for the meters and switches. The best instrument for cutting large holes is a device known as a "washer cutter" formed by two adjustable blades travelling on a horizontal bar in the middle of which is a centre-pin, the whole being arranged to work in the chuck of an ordinary drilling machine.

The Radio Frequency Box.

The edges of the main front panel must first be made true, then the seven holes drilled for the controls. The controls are all spaced evenly apart over the entire length of the panel, so that no measurements are needed beyond the external limits which are: Overall height, 34 ins.; width, 7¾ ins.



Front view of 10-watt transmitter with screens removed.

The diagrams show the arrangement of the two side panels which carry the valves and the coils, the right-hand panel taking one oscillator coil, the middle amplifier valve and the last amplifier coil. The right-hand panel takes the oscillator and the last valves, the second oscillator coil and the middle amplifier coil.

It is thus seen that the coils are very well spaced and quite shielded from one another. The performance of the set bears out some of the efficiency resulting from this feature.

The flush mounting valve-holders require holes of 15/16 ins., after which they are secured by four wood screws. The plug-in coils are mounted in sockets on bakelite bases screwed to the side panels with two wood screws. The coil for the final stage is made to mount upon stand-off insulators and the aerial coil likewise—this latter being set at about 2½ inches distant and allowed to pivot on the mounting to give semi-variable coupling.

When the three panels comprising the R.F. box are drilled and squared they are screwed together along the edges, placed vertically upon the power supply box and securely screwed to it from the under side. The rigidity of this arrangement is surprising.

Before the assembling of the R.F. box, the constructor must have set up the R.F. chokes inside with their by-passes at convenient positions, and the variable condensers are best mounted at this juncture. The layout inside is quite obvious, since there is nothing but chokes and by-passes to be fitted.

It is not necessary to make the leads to the chokes excessively short at high wave-lengths, so the positions for the parts are chosen with regard to the grids and anodes which they concern and their nearness to "live" radio frequency wires.

The leads from the coil-holders are taken from the terminals and carried into the inside of the box through holes close to the coil bases. With regard to the crystal holder, it is obvious that this must rest in the horizontal plane and that there is at present nothing available but the bottom panel of the R.F. box. It was decided that this was too far

from the oscillator grid, and therefore a small shelf of five-ply wood half the depth of the box is slipped into place and screwed at a level slightly below the oscillator valve-holder. Upon this shelf is set the crystal-holder, the oscillator grid choke and the middle amplifier grid choke with their associated by-pass condensers.

Mounting and Wiring the Components.

It is as well to stress at this point that every part can be wired up without the slightest difficulty when set in its final position. The assembly and wiring should be started in the radio frequency portion.

In dealing with aluminium covered wood of the "Plymax" variety it must be remembered that the thickness is rather more than is usual in these days and that the shafts of condensers, etc., are often a little short of coming through the panels. To obviate this, the holes must often be countersunk for the fixing nuts. Further, as all modern condensers have the spindles connected to the moving plates, the aluminium must be cleared from the holes to prevent shorting of parts and circuits. To clear a given hole, a small washer cutter should first be used until it has cut a disc out of the aluminium, which is then pealed off the wood, and the actual hole is drilled in the centre of this clear, round space, so that every hole taking a "live" spindle requires the metal removing for a circular distance round it. This effect removes some of the thickness of the panels and further counter-sinking is then not needed in many cases.

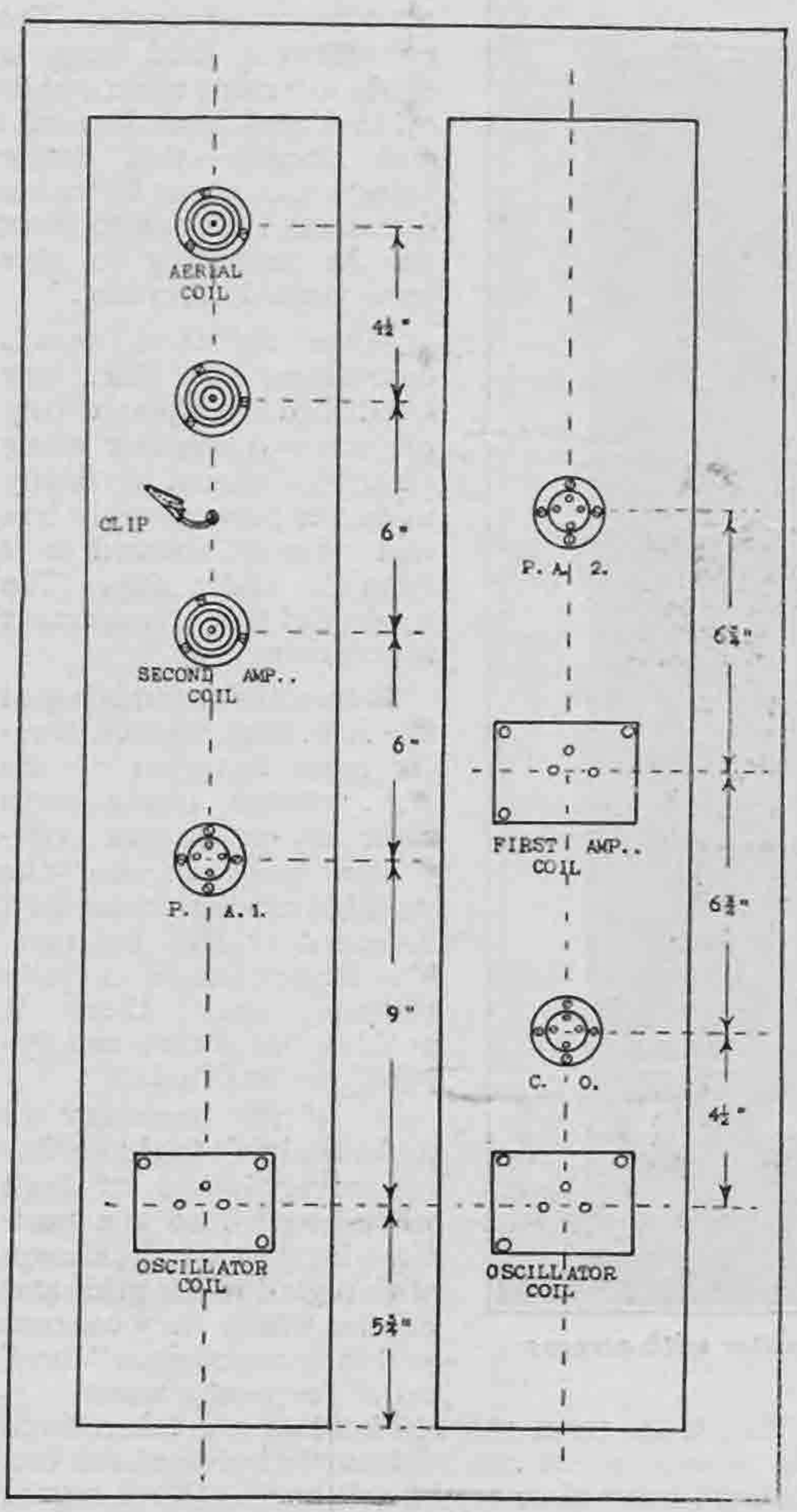


FIG. 3.

The lay-out of the two side panels of the centre box. The aerial coil is pivoted on a stand-off insulator to give variable coupling. The anode coil of the second amplifier is supported on two stand-off insulators.

The wiring is begun at the filament circuits and by-pass condensers and tucked away as much as possible to give ample space for R.F. wires later on. The filament wires should be of 16 gauge and well soldered to prevent voltage drops, as the filament current at 4 volts pressure is 4 or 5 amperes—depending upon the valves used.

The stand-off insulators for the second amplifier coil are wired up internally. The screw is removed and a wire fixed on the underside of the head, a hole is drilled through the panel in the middle of the place occupied by the insulator and the wire carried through to the inside of the box. Hence, no connections are visible from the outside.

The transmitter is then wired up stage by stage in the ordinary way, and the ease with which this can be done is largely dependent upon how well the chokes and by-pass condensers have been arranged. It is clear that their terminals should be set so that they can be moved from the open back of the box.

The feed wires for L.T., H.T. and bias are not yet fixed and these are fitted when the lower box is wired up. The bias leads are brought out directly, with plugs attached.

The major portion of the wiring is carried out with 18 gauge wire, but the tank circuits use 16 gauge. Over every wire is slipped a piece of Empire sleeving, which adds to the appearance as well as assures that no shorts can take place.

Wiring the Lower Box.

From the photographs, it is noticed that two long panels pass from top to bottom of the unit at the back. They do not close in the open back of the R.F. box, but are screwed to its edges and to any other edges available. They pass right down to the ground level and cover in each side of the open back of the power supply box. They thus form two convenient side panels at the extreme bottom on which to fit the terminals and the H.T. control resistances. Viewed from the back, the left-hand panel takes the three H.T. controls set in triangulated form, with the resistances projecting into the interior of the power supply box. The right-hand panel carries six terminals set symmetrically. They are the high and low tension supplies and the connections to the modulator. Two lines go out to the modulator—one to the anode and one to the filament negative. If the modulator is to be used for valve keying, as suggested in Part 1, a 1 or 2 mfds. condenser is fixed between set negative and the line going out to modulator negative. This isolates H.T. minus from the keying valve, but allows an audio path for telephony if the modulator has to be supplied from the same H.T. source as the set. If the supply sources are different—which is recommended—this is not needed and the

modulator and set negatives are electrically bonded.

Having set up the anode current meters and the switches, the power supply wiring can be commenced. Leads from the upper box are brought down to the lower box through a hole in the panel separating the two, and are then taken to their respective terminals. These leads can be bunched together with saddle clips and fastened to the back of the R.F. box during their descent to the

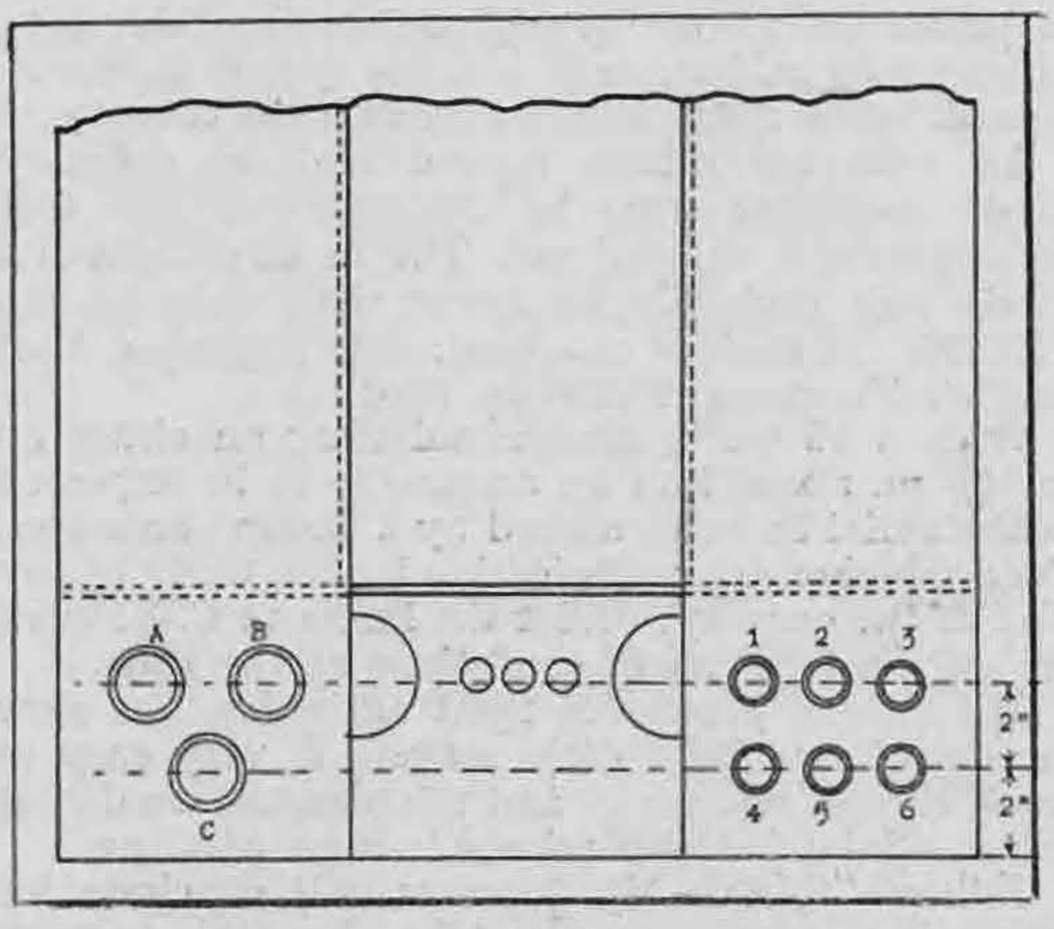


FIG. 4.

The lay-out of the rear panels. On the left, the three H.T. resistances, A and B, 5,000 ohms, and 10,000 ohms for oscillator anode and screen respectively. C for middle amplifier anode with another 5,000 ohms. The terminals are: (1) modulator anode (4) modulator negative line, (2) H.T. positive (5) H.T. negative (3) L.T. positive (6) L.T. negative.

lower box—picking up others as they go down, thus making a neat job. During the process of wiring the lower box the transmitter is upside down.

When this wiring is almost finished, the modu - lating transformer has to be placed into position This is screwed to the underside of the top panel of the lower box, right in the centre and close to the back of the switches. For this latter reason it must not be fitted until the last, otherwise the terminals of the switches would be obscured.

The transformer has three terminals—the middle one going to H.T. positive and the outers to amplifier and modulator anodes.

So much for the wiring up. The aerial coil and condenser have not yet been touched and now the " roof " is the final piece to be fitted. It carries two stand-off insulators wired internally and used for connecting to aerial and counterpoise wires. A pair of flexible connections are taken out of the left-hand panel side and joined to whatever type of aerial coil is used.

It is quite impossible to state accurately what sort of coil will be needed for the aerial coupling, as it depends entirely upon the aerial which is used. It should be found, however, that about 12 or 15 turns of close-wound wire of about 16 gauge will be enough to tune the average aerial to both 160 and 80 metres.

The tuning is parallel connected with the aerial condenser in shunt with the aerial coil.

Finishing Touches.

The screens for the back and sides may present ideas to readers. Actually, the original apparatus used is a frame work of " Tee " section aluminium beading with ¾ in. aluminium mesh set into it. The frames are hinged to the back panels to allow the sides to be opened for coil changing. The effect is very excellent upon the general appearance. A mesh is also made to fit into the open space running from top to bottom of the back, and this is a close fit, slipped into place and lightly fixed with two or three small screws. The plain wood back is then painted with silver paint and the exposed wooden edges touched up likewise. Around the front may be run a silver painted wooden beading at the bottom edge of the lower box, to give a finished appearance.

Operation.

It is always a moment of some considerable apprehension when the high tension is first applied. With the transmitter in question, the control and operation is so delightful that this feeling soon gives way to a comfortable assurance as the remarkably stable and efficient working is noticed.

The tuning procedure should be as follows :— Connect up high and low tension terminals. Apply bias to the two amplifiers in accordance with the usual rules for Class C operation, i.e., twice cut-off value—about 60 volts for the PX25 and about 90 volts for the P4100 with an anode voltage of 300 volts. Disconnect the H.T. from the two amplifiers and start the oscillator by switching on. Tune the C.O. to resonance and neutralise the first amplifier by the usual rules. Either a milliameter in the grid of the amplifier or by swinging the amplifier tuning control as the neutralising condenser is varied until it ceases to affect the oscillator anode current at resonance. (Sharp rise is seen when it comes into resonance, if the amplifier is not neutralised.) When neutralised, apply voltage to the amplifier and repeat the performance with the second amplifier. Apply high tension to this stage and the set should then be operating properly. Once neutralised, neither stage requires re-setting when the band is changed.

The H.T. controls are varied until the requisite drive is obtained for maximum aerial current at a given anode current of about 33 milliamperes at the last stage, with the aerial coupled up. This represents a ten watts carrier.

On test it was found that the oscillator takes about 20 milliamperes, and the middle stage from

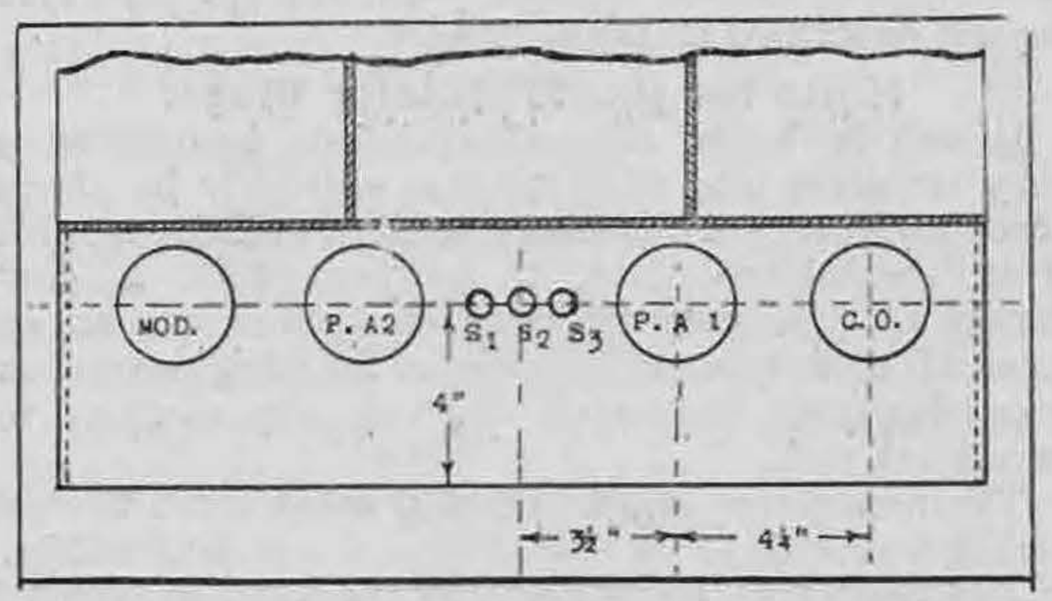


FIG. 5.

Lay-out of instrument panel. The switches are: (S1) Telephone-C.W. (S2) High tension On-Off (S3) Low tension On-Off.

15 to 20, depending on the drive supplied from the crystal. About 5 watts on the middle stage should be enough for telephone working. Of course, voltages of more than 300 volts will produce correspondingly increased anode currents. At 400 applied volts, the crystal stage will take some 25 or 30 milliamperes if needed, but this is an excessive figure. The middle stage will take about 35 milliamperes if needed and give about 13 watts input. Hence, it is seen that any amount of drive can be used for the last valve if it is wanted. The last stage, however, must not work at more than 300 volts for a telephone carrier as the power developed during modulation peaks is about four times the carrier power.

With no load and 300 volts on the anode, the last stage takes about 8 milliamperes, again depending upon the drive supplied.

Correct Telephony Procedure.

The optimum load for the *Osram* PT16 pentode is 5,000 ohms and the modulating transformer ratio is 1.34 to 1. This means that the load presented by the modulated amplifier must be about 9,000 ohms. To obtain this load, the anode voltage of the amplifier must be 300 volts and the anode current approximately 33 milliamperes. The aerial current should be totally disregarded when tuning for telephony. The aerial coupling should be varied until the anode current rises to 33 milliamperes and modulation then commenced. The microphone amplifier gain control is then opened until full modulation is taking place. No fluctuations of any magnitude are allowed in the amplifier plate current during speech. Their presence indicates distortion or over-modulation.

Correct C.W. Settings.

The limit to the input is here only a matter of the valve limitations. The PX25 will dissipate 25 watts at the anode at 400 volts. Hence, it might be possible to allow even 100 milliamperes of anode current if the valve will supply it. However, it would be safe to allow some 50 or 60 milliamperes current without any undue heating. As the transmitter is designed for 10 watts input, the rating of 300 volts, 33 mas. will be found to be most satisfactory working. The bias should be increased beyond twice cut-off until a high efficiency results. The drive will have to be strengthened in proportion. It may be found that three times cut-off bias will give very, cool, efficient work.

Any of the usual methods of keying will be satisfactory. The middle stage, the centre tap method, the oscillator screen or, above all, the special valve keying described in the last part.

Hints for the Modulator Stage.

It will be found that the pentode modulator is very sensitive and that its bias will only be about 15 or 20 volts. It is likely to give endless trouble if it should oscillate, to prevent this, a condenser of .002 may be connected from the anode to earth as a type of impedance limiting device, or a combination resistance and capacity as fitted to broadcast sets.

The modulator should be well away from the set and connected to it shielded and earthed cables. H.F. chokes may be included in the leads to prevent R.F. from feeding back. The use of the *Osram* MH41 in the stage between microphone and modulator will be found to give far more sensitivity than needed for full modulation with quite an insensitive microphone.

General Performance.

For band changing, the special coils supplied by *Quartz Crystal Co.* facilitate this operation tremendously. For 160 metres the oscillator works on the fundamental frequency and the first of the oscillator coils is shorted through with two plugs and a flexible wire. For 80 m. the first coil holder has a 160 metres coil in it and the second an 80 metres coil. The second coil is tuned to select the second harmonic (so-called). A pentode oscillator develops sufficient 80 m. harmonic and the system is now in general use in many stations all over the country.

All coils are centre tapped and an ordinary triode oscillator may be employed if the first oscillator coil is shorted out. The anode current of a triode will probably be lower than that of the PM24M. If such is not used, it is suggested that another Tungsram P4100 be used.

With a 10 watts carrier radiating on either 80 or 160 m. about half an ampere is to be expected in the aerial lines, measured by a thermo-ammeter. Good telephone communication is then likely in any part of the country, whilst the limits to C.W. work are only a function of conditions at the time.

The tuning process is most agreeable, the slow motion of the *Polar* dials making it very easy to reach correct resonance, and the pleasant dead-beat action of the *Ferranti* meters is most assuring.

Editorial Note.—Mr. Livesey will conclude his article in a later issue. Part 3 will contain answers to queries raised as a result of the publication of Parts 1 and 2. This article will also appear in " A Guide to Amateur Radio " (second edition).

We are advised by Mr. A. E. Livesey (G6LI) that the stand off insulators used in the above transmitter were supplied by *Loomes Radio* and not by *Quartz Crystal Co.* We understand both firms are in a position to supply all component parts for this set.

LOYAL RELAY, 1934.

ONCE again the Society had the honour of conveying to its Patron, H.R.H. The Prince of Wales, Loyal greetings on the occasion of his 40th birthday.

As so often happens during the month of June, radio conditions were far from good, but thanks to the untiring efforts of a small group of E.L.S. and others we were able to present to H.R.H. a more representative batch of congratulatory messages than ever before.

An outstanding achievement was accomplished by Mr. Harold Chorley, G5YH, who had the honour of accepting no fewer than 16 messages. Good work was also effected by Mr. Jack Wyllie, G5YG, and Mr. A. E. Livesey, G6LI, both of whom devoted many hours to the task of listening for B.E.R.U. calls.

The finest individual overseas effort stands to the credit of Mr. Eric Holden, VO8H, our Newfoundland representative. Determined to send the VO greetings direct he set up on high ground a tiny 4-watt portable transmitter, and by great good fortune G5YH heard his first "CQ B.E.R.U." call.

Numerous semi-official messages were received, but for obvious reasons these could not be included with those delivered by Mr. Arthur Watts to St. James' Palace on the morning of June 23. The originators of these messages are, however, thanked for their interest and assistance.

The text and routes taken by all messages are as follows :—

St. James's Palace, S.W.
27th June, 1934.

Dear Sir,—I am desired by The Prince of Wales to thank you for your letter of June 23rd, and to ask you to convey an expression of His Royal Highness's appreciation of their message of greetings to the Council and Members of the Incorporated Radio Society of Great Britain.

His Royal Highness would also be grateful if you would convey his thanks to the senders of the various messages from different parts of the world, enclosed in your letter referred to above.

Yours very truly,
H. LLOYD THOMAS,
Asst. Private Secretary.

A. E. Watts, Esq.,
President,
Incorporated Radio Society of Great Britain,
London, S.W.1.

To H.R.H. THE PRINCE OF WALES.

On behalf of the Council and Members of The Incorporated Radio Society of Great Britain, I extend to your Royal Highness loyal greetings and heartiest congratulations on your Birthday. We are deeply appreciative of your continued interest in our work and hope that you may long continue to be Patron of our Society.

ARTHUR E. WATTS,
President.

Assam, Northern India, B.E.R.U. Message from The British Empire Radio Union Members of Northern India *via* VU2LJ, VS6AQ and G6CJ. No. 1.

June 18, 1934.

To H.R.H. THE PRINCE OF WALES,
c/o The British Empire Radio Union, London.

The British Empire Radio Union Members of Northern India join in sending your Royal Highness sincere wishes for a happy birthday, and take this opportunity in affirming the loyalty of this part of the Empire.

(Signed) MCINTOSH, VU2LJ.

Govinna, Ceylon, B.E.R.U. Message from The Radio Club of Ceylon and Southern India, *via* VU2LJ, VS6AQ and G6CJ. No. 2.

June 18, 1934.

To H.R.H. THE PRINCE OF WALES,
c/o The British Empire Radio Union, London.

The Members of the Radio Club of Ceylon and Southern India send loyal greetings, wishing H.R.H. The Prince of Wales a very happy birthday.

(Signed) JOLLIFFE, VS7GJ.

Johannesburg, South Africa, B.E.R.U. Message from S.A.R.R.L. *via* ZU6W, SU5NK, ZC6CN and G5YG.

June 15, 1934.

To H.R.H. THE PRINCE OF WALES,
c/o The British Empire Radio Union, London.

The South African Radio Relay League respectfully send Birthday Greetings.

Northern and Southern Rhodesia B.E.R.U. Message from ZE1JE *via* ZT6X, ZU6W, SU5NK, SU1SJ and G2ZQ.

June 21, 1934.

To H.R.H. THE PRINCE OF WALES,
c/o The British Empire Radio Union, London.

Members of the British Empire Radio Union in Northern and Southern Rhodesia send loyal Birthday Greetings to His Royal Highness.

(Signed) MAVIS, ZE1JE.

Nairobi, Kenya Colony, B.E.R.U. Message from VQ4CRL *via* G5NF and G5YH.
June 19, 1934.
To H.R.H. The Prince of Wales,
c/o The British Empire Radio Union, London.
The Radio Society of East Africa and all local members of the British Empire Radio Union send their sincere and loyal birthday greetings to His Royal Highness, The Prince of Wales.
(Signed) Davidson, VQ4CRL.

Halifax, Nova Scotia, Canada, B.E.R.U. Message from VE1DE *via* VE1BV, G6VP, GI5NJ and G5YH.
June 17, 1934.
To H.R.H. The Prince of Wales,
c/o The British Empire Radio Union, London.
On behalf of the Halifax Amateur Radio Club, I take great pleasure in extending birthday greetings to your Royal Highness.
(Signed) J. P. D. Mackasey, VE1DE.

Montreal, Canada, B.E.R.U. Message from VE2CX *via* VE2CA and G5YH.
June 10, 1934.
To H.R.H. The Prince of Wales,
c/o The British Empire Radio Union, London.
On behalf of the Members of the British Empire Radio Union in Quebec Province, please accept our congratulations on your birthday.
(Signed) Prissick, VE2CX.

St. Lambert, Quebec, Canada, B.E.R.U. Message from VE2BE *via* VE2CA and G5YH.
June 13.
To H.R.H. The Prince of Wales,
c/o The British Empire Radio Union, London.
The transmitting amateurs of Canada send you heartiest birthday greetings and many happy returns of the day.
(Signed) A. Reid, VE2BE,
Canadian General Manager.

St. Lambert, Quebec, Canada, B.E.R.U. Message from VE2GA *via* VE2CA and G5YH.
June 21, 1934.
To H.R.H. The Prince of Wales,
c/o The Radio Society of Great Britain, London.
Birthday greetings from all amateur radio operators of Quebec Division, A.R.R.L.
(Signed) J. A. Robertson, VE2GA.

Verdun, Quebec, Canada, B.E.R.U. Message from VE2EE *via* VE2CA and G5YH.
June 16, 1934.
To H.R.H. The Prince of Wales,
c/o The Radio Society of Great Britain, London.
One of Canada's transmitting amateurs begs to extend to your Highness heartiest congratulations on your birthday.
(Signed) S. Comach, VE2EE.

Longueuil, Quebec, Canada, B.E.R.U. Message from VE2BG *via* VE2CA and G5YH.
To H.R.H. The Prince of Wales,
c/o The Radio Society of Great Britain, London.
Birthday Greetings.
(Signed) T. H. Letts, VE2BG.

St. Lambert, Quebec, Canada, B.E.R.U. Message from VE2CA *via* G5YH.
June 18, 1934.
To H.R.H. The Prince of Wales,
c/o The Radio Society of Great Britain, London.
Best wishes for many happy returns of the day.
(Signed) Mr. and Mrs. E. H. Turner, VE2CA.

Toronto, Canada, B.E.R.U. Message from VE3HF *via* G5YG.
June 17, 1934.
To H.R.H. The Prince of Wales,
c/o The British Empire Radio Union, London.
Birthday greetings from Toronto amateurs.
(Signed) Lynch, VE3HF.

Ontario, Canada, B.E.R.U. Message from VE3QJ *via* G5YH. No. 1.
June 18, 1934.
To H.R.H. The Prince of Wales,
c/o The British Empire Radio Union, London.
Birthday greetings from the amateurs of Ontario.
(Signed) Ted Teckoe, VE3QJ.

Support Convention

Winnipeg, Manitoba, Canada, B.E.R.U. Message from VE4KY *via* VE2CA, G5YH and G5NF.
June 19, 1934.
To H.R.H. THE PRINCE OF WALES,
c/o The British Empire Radio Union, London.
All amateur radio operators in the fourth Canadian district extend to you their heartiest birthday greetings.
(Signed) RONALD VALE, VE4KY.

St. John's, Newfoundland, B.E.R.U. Message from VO8H and VO8HK *via* G5YH.
June 10, 1934.
To H.R.H. THE PRINCE OF WALES,
c/o The British Empire Radio Union, London.
Radio Amateurs of Britain's oldest Colony send loyal birthday greetings.
(Signed) HOLDEN, VO8H.

Kai-Tak, Hong Kong, B.E.R.U. Message from VS6AQ *via* G6QX.
June 7, 1934.
To H.R.H. THE PRINCE OF WALES,
c/o The Radio Society of Great Britain, London.
The Radio Amateurs of Hong Kong send loyal greetings and best wishes for a happy birthday.
(Signed) CONWAY, VS6AQ.

Kuala Lumpur, Federated Malay States, B.E.R.U. Message from VS2AF *via* G2KZ.
June 11, 1934.
To H.R.H. THE PRINCE OF WALES,
c/o The British Empire Radio Union, London.
Loyal birthday greetings to your Royal Highness from the Malayan Group of The British Empire Radio Union.
(Signed) MACINTOSH, VS2AF.

Cairo, Egypt, B.E.R.U. Message from SU1EC *via* G5YH.
June 10, 1934.
To H.R.H. THE PRINCE OF WALES,
c/o The British Empire Radio Union, London.
Birthday greetings and good wishes from all members of The British Empire Radio Union in Egypt.
(Signed) COLE, SU1EC.

Quirindi, New South Wales, Australia, B.E.R.U. Message from VK2HC *via* VK3WL and G5YH. No. 33C.
June 10, 1934.
To H.R.H. THE PRINCE OF WALES,
c/o The British Empire Radio Union, London.
The Amateurs of Australia and Australian Members of The British Empire Radio Union join in sending sincere and loyal greetings to your Royal Highness on the occasion of the anniversary of your birthday.
(Signed) CARTER, VK2HC.
(This message was also received by G6LI *via* VE4BF, VE2BE and VE2CA.)

Malta B.E.R.U. Message from BERS161 *via* VP3B and G6LI. No. 1.
June 14, 1934.
To H.R.H. THE PRINCE OF WALES,
c/o The British Empire Radio Union, London.
The British Empire Radio Union members of Malta send heartiest birthday greetings to your Royal Highness, via Amateur Radio.
(Signed) H. G. CUNNINGHAM
(Local Representative of B.E.R.U.)

Dunedin, New Zealand, B.E.R.U. Message from ZL4BP *via* ZL4AO and G5YH. No. 61.
June 17, 1934.
To H.R.H. THE PRINCE OF WALES,
c/o The British Empire Radio Union, London.
The amateur radio transmitters of New Zealand desire respectfully to tender to your Royal Highness their felicitations on the occasion of your Highness' birthday, together with their loyalty and deep appreciation of your interest in former loyal relays, and in amateur radio communication within the Empire.
(Signed) WILLIAM G. COLLETT, ZL4BP
(President, New Zealand Amateur Radio Transmitters).

Port Louis, Mauritius, B.E.R.U. Message from V8AB *via* ZT6X, ZU6R, SU5NK, ZC6CN and G5YG.
June 17, 1934.
To H.R.H. THE PRINCE OF WALES,
c/o The British Empire Radio Union, London.
Members of the British Empire Radio Union in Mauritius wish to convey their loyal birthday greetings.
(Signed) MAZERY, V8AB.

Ramleh, Palestine, B.E.R.U. Message from ZC6FF *via* ZC6CN and G5YG.
June 17, 1934.
To H.R.H. The Prince of Wales,
c/o The British Empire Radio Union, London.
Members of the British Empire Radio Union in Palestine respectfully send birthday greetings.
(Signed) Fenner, ZC6FF.

Horta, Fayal, Azores, B.E.R.U. Message from CT2AW *via* G6CL.
June 15, 1934.
To H.R.H. The Prince of Wales,
c/o The British Empire Radio Union, London.
The Radio Society of Great Britain membership of Horta, Fayal, Azores, join in wishing your Royal Highness a very happy birthday.
(Signed) Freshwater, CT2AW.

To H.R.H. The Prince of Wales,
c/o The British Empire Radio Union, London.
Members of The British Empire Radio Union in Nigeria send their loyal birthday greetings and best wishes to His Royal Highness, The Prince of Wales.
(Signed) Wilmot, ZD2A.

Kingston, Jamaica, B.E.R.U. Message from VP5PZ *via* G6VP. No. 1.
June 10, 1934.
To H.R.H. The Prince of Wales,
c/o The British Empire Radio Union, London.
The Radio Association of Jamaica respectfully tender their loyal greetings on your birthday and pray that your Royal Highness may long be spared to a life of usefulness, health and happiness.
(Signed) Grinan, VP5PZ.

Irish Free State, B.E.R.U. Message from EI9D *via* G6VB and G2DU.
June 18, 1934.
To H.R.H. The Prince of Wales,
c/o The Radio Society of Great Britain, London.
Members of The Radio Society of Great Britain and The British Empire Radio Union in the Irish Free State send your Royal Highness loyal and sincere birthday greetings.
(Signed) Noblett, EI9D.

Pachuca, Mexico, B.E.R.U. Message from X1AI *via* VE2CA, G5YH and G5NF.
June 17, 1934.
To H.R.H. The Prince of Wales,
c/o The Radio Society of Great Britain, London.
On behalf of the British radio amateurs in Mexico I beg to extend heartiest birthday greetings.
(Signed) J. A. Seaver, X1AI.

Hartford, Connecticut, U.S.A., B.E.R.U. Message from The American Radio Relay League *via* WICFY, W2DFN and G2ZQ. No. 1.
June 21, 1934.
To H.R.H. The Prince of Wales,
c/o The Radio Society of Great Britain, London.
The Radio Amateurs of the United States join those of the Empire in sending felicitations to your Royal Highness on this happy occasion.
(Signed) Hiram Percy Maxim
(President, A.R.R.L.).

Newark, New Jersey, U.S.A., B.E.R.U. Message from W2DFN *via* G2ZQ. No. 52.
June 18, 1934.
To H.R.H. The Prince of Wales,
c/o The Radio Society of Great Britain, London.
On behalf of members of the Radio Society of Great Britain in the United States of America I wish to extend birthday greetings to the Patron of the Society, His Royal Highness, The Prince of Wales.
(Signed) N. C. Stavrou, W2DFN.

Montreal, B.E.R.U. Message from The Royal Empire Society, Montreal Branch, *via* VE2CA, G5YH and G5NF.
June 19, 1934.
To Sir Lionel Halsey, Comptroller, St. James's Palace, London,
c/o The British Empire Radio Union, London.
Loyal fellows of the Royal Empire Society respectfully send birthday greetings to His Royal Highness, The Prince of Wales.
(Signed) William M. Birks
(President).

AMATEUR AERIAL PRACTICE

By R. J. Keir (G6JX).

MUCH has been written on the subject of aerials in the past, and it is not my intention here to cover previous ground again. Rather I intend to combine a controversial discussion and some criticism, with a consideration of some practical points which appear to be neglected by the average amateur. I do not wish to assume a knowledge which I do not possess, and if I can present some of the problems which have not been too well dealt with in the past, for elucidation by more learned amateurs, I shall be satisfied.

The main difficulty which arises in connection with aerials is the intangible nature of the subject. An aerial will almost always function somehow or other, but the effect of radiating feeders as regards directional effects and the radiation of energy at various angles are only two of the problems to which no precise solutions are available. All one can do is theorize upon results obtained from practical tests.

Turning to the amateur aerial, the main problem is to secure an efficient radiator which will operate on at least two frequencies (one usually twice the other) and give omni-directional radiation. Many amateurs put up a system which is designed for a given frequency. Whether the aerial will be a success when operated at twice the frequency is a matter which is controlled by accidental circumstances. Theoretically, an unphased multi-half-wave aerial should give high-angle radiation, but the successes of many amateur systems appear to give the lie to this dictum.

These are matters with which this article is mainly concerned. I have divided this article roughly into three groups, dealing with the top first of all, and then the feeders, concluding with a criticism of systems which seem to be widely used among amateurs. The latter is intended to arouse the Zepp fiends to rise and argue !

The Top.

By "the top," I refer to that section of the aerial system whose duty it is to radiate usefully the energy conveyed to it from the transmitter. The method of accomplishing this is to generate a standing wave, and the amplitude of the current antinode upon which radiation is mainly dependent is controlled by the correct proportioning of the top.

A prevalent practice with amateurs, is to determine the length of the top by means of an empirical formula or chart. While this may serve as a rough guide, it is by no means accurate. Consider the theoretical case. Given a transmitter operating on one frequency, then to find the length of wire to accommodate half a standing wave, we convert the frequency to wavelength and divide by two. The length of wire thus obtained will only apply under perfect conditions, which imply that the wire is located infinitely in space. The effect of proximity to earth will be to decrease this length. The only way to determine the length of wire, for maximum radiation, is by experiment. When using half-wave or multi-half-wave tops, fed directly from the tank circuit, the resonance point may be found accurately as follows: Alter the length of the wire until it is possible to tune for the absolute minimum feed with the top tapped on, then remove the top, when the feed should fall to the no-load point, tank tuning remaining unaltered. Indications of whether the top is too long or too short may be obtained by noting whether the tank capacity has to be increased or diminished in order to secure minimum feed after the top has been tapped on, the circuit having been previously tuned to the no-load point without the aerial on. Minimum feed will not, of course, be the current at no-load.

Antenna Height.

The next point we have to consider is the best height for the radiator. The vertical polar diagrams at quarter, half and full-wave heights show that maximum radiation is directed at roughly 50, 35 and 20 degrees respectively, so that the top should be suspended at full-wave height for the band in use. This will ensure good low-angle radiation,

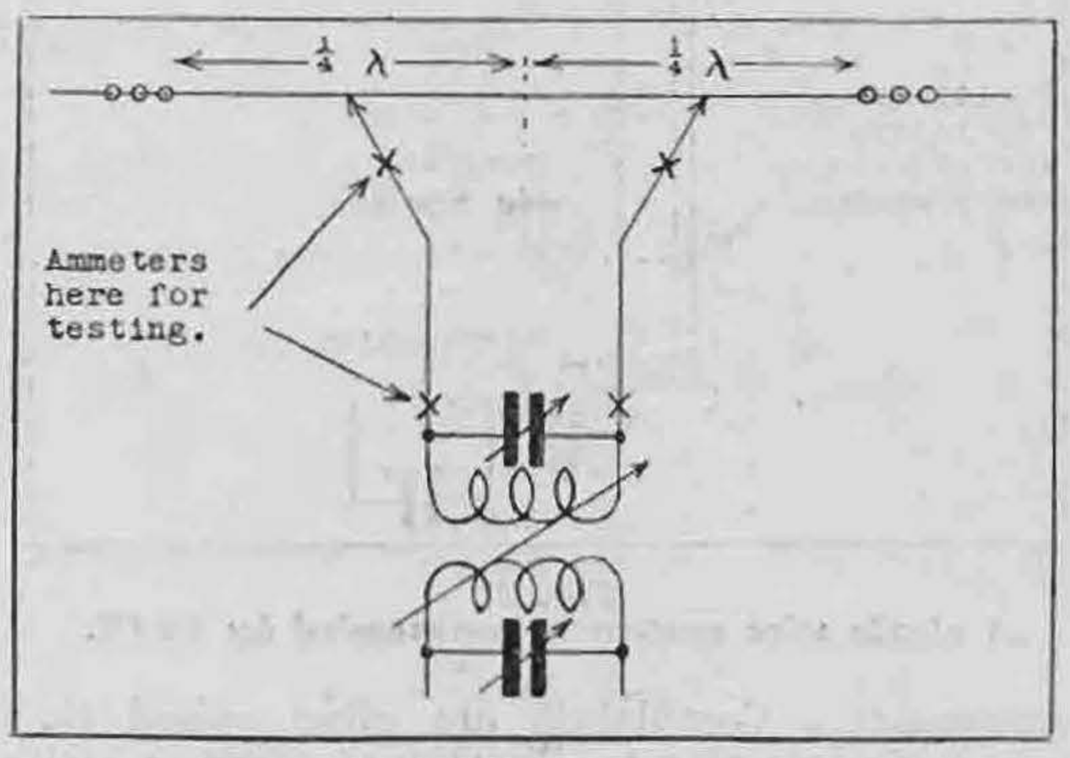


Fig. 1.
Matched impedance system described by G6JX.

while a small high-angle component should give sufficient signal strength for local working.

Multi-Band Operation.

The question of multi-band working has now to be considered, and it is here that difficulties abound. If we design our top for, say, half-wave operation on 7 mc., then, by arranging the height accordingly, we can obtain good results on this frequency. But on attempting to operate the antenna at its second harmonic (on 14 mc.), performance may be poor, due to radiation at high angles. The obvious remedy is to incorporate some phasing device, but this is not desirable, as it would upset the function of the top for half-wave working.

Another consideration which upsets the efficient functioning of a top, working on two bands, is that mentioned by G6IZ recently in Contact Bureau notes. This effect is observed when the top has been cut to suit the fundamental, and on changing over to the second harmonic it is apparent that a further length of wire must be added to the top

in order to bring it back to resonance. In an actual test at G6JX, it was found that approximately 2.5 ft. had to be added to the top when working on 14 mc. The top had been previously cut to resonate on 7 mc. as fundamental. This is referred to later. The effect of the top being off resonance is to introduce reactance to the load on the transmitter instead of a resistive load as when at exact resonance.

A good example of an arrangement for operation on two bands is that shown in Fig. 1A. This system uses an unterminated feeder, being fed by standing waves upon the feeder lines and excitation may be applied at any quarter wave point on the feeder, either at a current or voltage antinode, dependent upon its length. When used at its harmonic, the system behaves as two-phased half-waves fed at voltage antinodes. This system is discussed more fully under practical conditions.

Feeders.

Feeders and their vagaries seem to create much discussion in amateur circles and it is a moot point whether or not their use is, in many cases

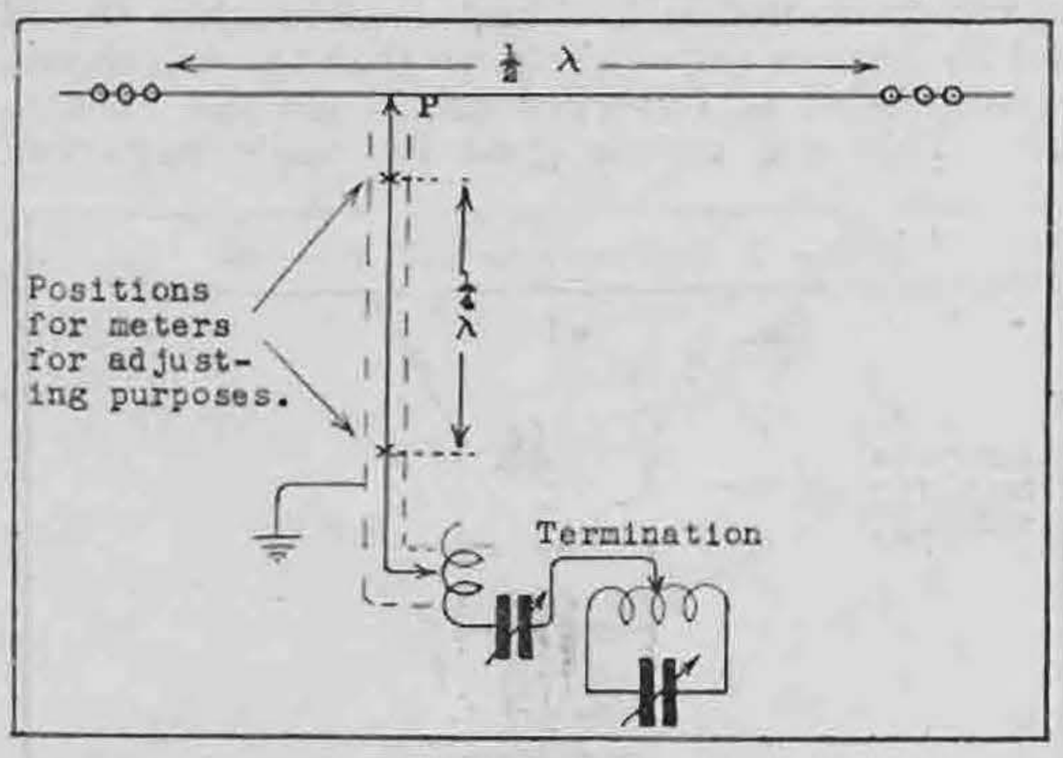


Fig. 2.
A single wire system recommended by G6JX.

unnecessary. Complaints are often raised that their use gives rise to directional effects usually due to incorrect termination, but this is not of so much importance as that of losses in the feeder, in the writer's opinion. Losses may be attributed to leakages and incorrect proportioning of feeders. These factors are met with in systems which have standing waves upon the feeders. It is doubtful whether such feeders are really worthy of the name, as they are usually wires carrying standing waves which are folded back on each other with the idea of cancelling radiation, which, of course, is fallacious.

From personal experience, many amateurs would obtain better results by feeding the top from the tank circuit where possible, unless they are prepared to take meticulous care in erecting such a feeder line.

A feeder implies a non-radiating link between generator and radiator which transfers energy with the minimum of loss. The only feeders in this class are of the terminated type, which will now be discussed.

Let us now consider the twin-wire feeder. Owing to the fact that the method of operation of this system appears to be imperfectly understood, I feel that it would, perhaps, be wise to deal fully with the theory. When, in a pair of parallel wires of infinite length, energy is supplied to one end of the feeder, it travels forward and does not return and so set up reflection. To use a homely simile, it is like a carrot tied to a stick and held in front of the donkey's nose. The load which these lines put upon a generator is identical with a pure resistive load, hence its value may be found, and if we take a pure resistance of the same value, it is obvious that if the feeder is cut and this resistance connected across it, then the feeder is under the same conditions, electrically, as if it were still stretching to infinity. It is obvious from this that once the correct termination has been attained, the length of the feeder has no significance. The resistance which we inserted is called the characteristic or surge impedance, and it is controlled by the ratio of spacing to wire radius used for the feeder, the impedance rising as this ratio is increased, within limits.

A point to which sufficient emphasis has not been given in the past is that the circuit at the end of the feeders is merely a power control, and has nothing to do with the prevention of radiation. The greatest energy transfer will be secured when the impedance of the coupling circuit is equal to the surge impedance of the line.

Single-Wire Feeder.

If we apply the above reasoning to the case of a twin-wire feeder employing very great spacing between the lines, we shall find that the surge impedance does not increase to the same extent. We can employ one wire as a feeder, the surge impedance of which will be generally greater than that of the twin feeder, and it will be controlled to some extent by its proximity to earth. To secure correct termination of the feeder it must be attached to the top at a point where the impedance is equivalent to the characteristic impedance of the line. This is quite practicable, since the effective impedance of a half-standing wave varies from a low value at the centre to a high value at the ends, and at some intermediate point the feeder will be correctly terminated. The reactances at this point cancel. There will, of course, be two such points in a half-wave top.

When we achieve correct termination at both ends of the feeder the maximum of energy will be supplied to the top, *but, even although there is no reflection on the line, it will still radiate, as the field about it is unrestricted.*

The Zeppelin.

If a census were taken to ascertain the most popular amateur aerial, the Zepp. would, doubtless, hold first place. The reasons for its popularity are that it functions well and that it is easily erected. Since the feeders are not true feeders, as mentioned before, in that they are not terminated or symmetrical, radiation will take place, but in the circumstances in which it is used, this is not serious, as directional effects and losses in the short lines employed will be small.

Among the systems in the single-wire fed class, that known as the Windom appears to be about the only type in common use. It owes its popularity to the fact that it functions in a way on two wave-bands. There is no justification for attaching

the feeder at the specified point, and it would appear as though the feeder operates as a very approximately terminated line to the top when feeding a half-wave, and exciting the top at a current antinode in one half-wave by virtue of a standing wave on the feeder when operating at the higher frequency. Thus it would seem rather poor practice.

The practice of attaching a single-wire feeder to a top by means of a chart is as bad as cutting the top by paper. Better excitation can often be secured by closer attention to the matching of the feeder.

When the top is actually fed from the tank circuit and its length is correct, it should radiate well, but we are limited by loss of effective height, and losses will occur at the feed point which is usually at high R.F. potential.

Practical Notes.

The main objection to most amateur aerials is the fact that most of them employ feeders which have standing waves in them. The presence of voltage antinodes on feeders is undesirable, in so far as serious losses will be caused by leakages, and radiation and consequently their behaviour is uncertain. Moisture on spreaders will not improve the efficiency of such an aerial system.

It would be desirable, therefore, to employ some method of feeding the aerial, by a link which was not at high potential, thus getting rid of leakage losses and insulation difficulties. Such a method employs a terminated feeder of some type, and is undoubtedly the most efficient means of passing energy to the top, in fact, it is really the only true feeder. Unfortunately, this method is not in favour, owing to the fact that it is only of service on the frequency for which it is set up, although it can form part of a system for use on lower frequencies. It should, however, interest the man who works on 14, 3.5 and 1.7 mc., since a site for the top can be chosen which favours 14 mc. operation as regards height and clearance from obstacles, etc., the length of feeder being unimportant. Losses in terminated lines are not great even when they are very long.

The arrangement of the two systems is given in Figs. 1 and 2. The erection is a simple matter, and the securing of correct termination is not difficult. When there are no standing waves upon the wire, then it is evident that the feeder is matched into the top. To eliminate standing waves ammeters are placed in the lines at the points marked X, and the junctions of the feeder at the centre of the top are slid outwards until all four meters read the same. It has been the writer's experience that the electrical centre of the top and the physical centre are not coincident. It is not necessary to use thermo-couple current indicators. Ordinary hot wire instruments may be used, provided that they are re-calibrated from the same source of R.F., one being taken as standard. The correct dimensioning of the top may be checked with the help of an ammeter at P. For this purpose it is recommended that the ends of the top are passed through the insulator and twisted back along the wire, thus leaving a margin with which to work.

It is essential that the current in both lines be the same.

A similar method should be adopted with regard to the single wire terminated feeder, and it should again be possible to secure uniform current in the line.

While a small amount of radiation from a feeder is not detrimental, it has occurred to the writer that in the case of the latter method it could be prevented altogether and the care needed in matching somewhat relaxed if the feeder were enclosed by an earthed screen. This could conveniently be done by using as the feeder a length of screened lead-in, now sold by several manufacturers. The sheath is connected to earth, and serious losses, if present, will be made evident by current flowing in the earthing lead, and if this is the case, a wire screen reminiscent of the " sausage " aerial might be employed with the feeder running up the middle.

The " Current-fed " System.

This is the best compromise for fundamental and second harmonic operation.

It is an old favourite, but there are several points in connection with its adjustment which are worth attention. It is open to the objections raised in

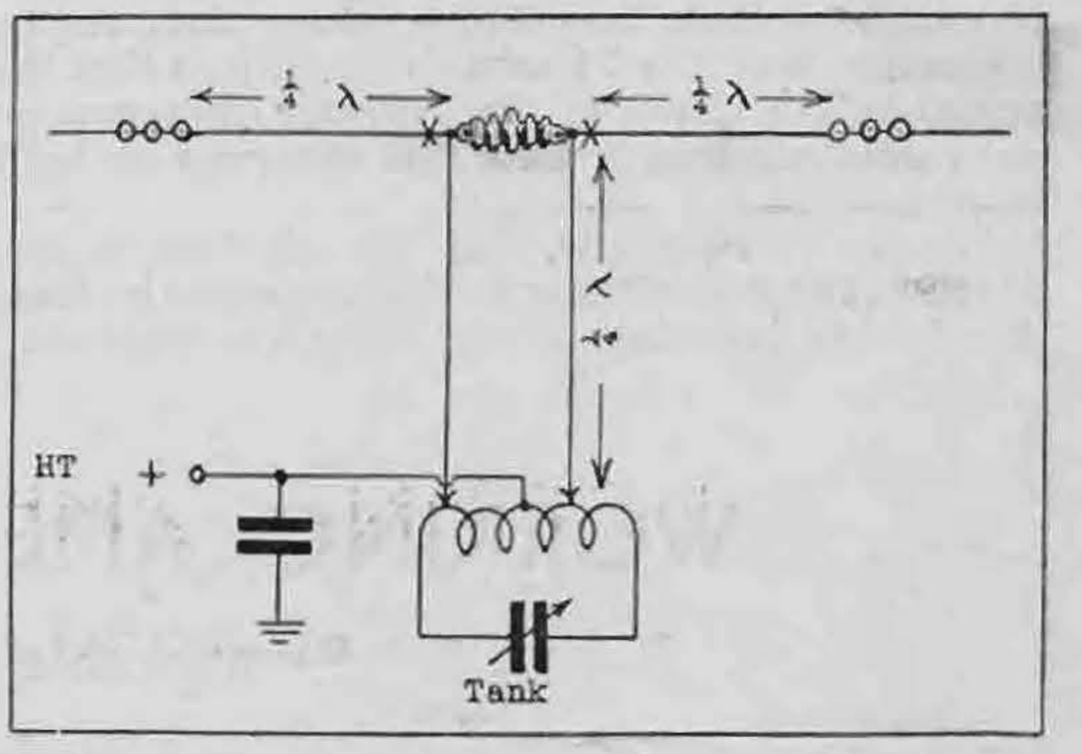


Fig. 3.
A current fed system.

connection with pseudo feeders with regard to leakages, but if wide spacing of feeders is adopted and long leakage paths provided on the spreaders, then it should be fairly efficient. Lines of roughly the correct length should be erected in position, but with dummy tops of cord. A bridge with ammeter slid over the wires about the current antinode position will locate this point exactly, and the real tops should be attached at these points. Ammeters at X in Fig. 3 in each top will indicate the maximum when the tops are of the correct length on the fundamental. This aerial should be set up primarily for fundamental working. When working on the second harmonic it will be necessary to lengthen the feeders as mentioned before. A quarter wavelength of feeder will generally be longer than the quarter wave of one top.

Some favour feeders which may be of correct length for one band and incorrect for the other, *e.g.* 48-ft. feeders. Such feeders will be inefficient on the band for which the length is not correct, as the coupling circuit must possess an impedance intermediate between high and low values in order to get power into the feeders. With the series tuned coupling, the impedance at resonance will be very low, and with parallel resonance the impedance will be very high.

Operation on Lower Frequencies.

Many of the previous systems may form part of an aerial which may be used for 3.5 and 1.7 mc.

C. U. A. C.?

by the addition of a length of wire, which, taken together with the top, will make up an electrical half wave. This additional wire is often called a counterpoise.

Best results will be obtained if the total length of wire is half-wave long and if the feed point can be arranged at the centre, when a simple series circuit will be used as the coupling. If the wires are shorter or of an equal length, the impedance may be " cooked " to suit.

The practice of running the additional wire under the top would seem to make the aerial resemble a " folded " feeder, employing very great spacing between the lines, thus it would not be a very good radiator. It is, therefore, better to continue the extra wire as an elongation of the top in the opposite direction (like an unsymmetrical " current fed " arrangement), or to run it at right angles to the top.

Directly excited half-wave tops will, of course, be useful for these frequencies where their erection is possible, and it will probably be noticed that their actual length shows an even greater discrepancy to the calculated length than was observed on higher frequencies.

My theory of this is, that the effective capacity of the radiator decreases as the frequency increases, due to the lowering of the dielectric constant of air. It is known that the values of this vary in inverse proportion to frequency. This reduction of capacity would make necessary a larger inductive component to obtain resonance to the top, hence the increase in length of the wire. Opinions on this point will be welcomed.

Conclusion.

It has not been my intention to discourage the us of such aerial systems, but to point out the fallacies upon which their operation is based. A multitude of examples could be given which make it appear that many things which are really poor in theory often give quite good results in practice.

If this article has served its purpose, it should bring forth abundant criticism. The writer does not vouch for the correctness of some the statements made, as they merely represent his point of view, and authoritative opinions will be welcomed, as they will not only make clear to him the error of his ways, but what is more important, they may set others on the right road, who may have held similar opinions. Prove to Uncle Tom that the amateur is not such a bad beast after all !

My thanks are due to Mr. A. W. Ladner (joint author of " Short Wave Wireless Communication "), for his explanation of the single-wire feeder. I hope I have interpreted it correctly.

WORKING AMERICA ON 1.75 MC.

Remarkable Feat for Low Power

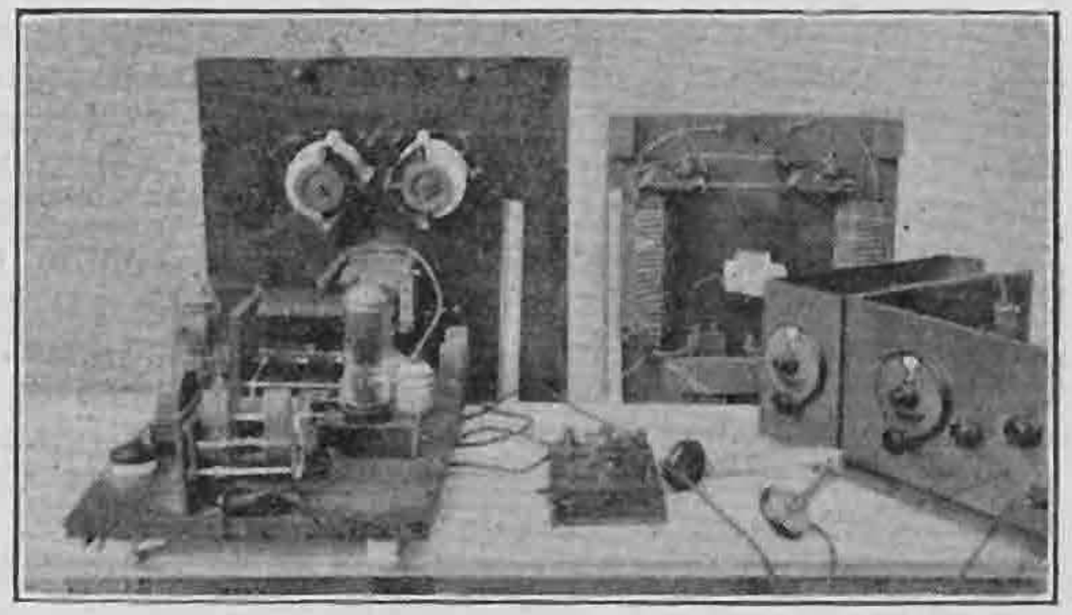
IT can be said without exaggeration that G5WU, Mr. D. Low, of Penarth, South Wales, raised a new pinnacle in amateur history—and a considerable one, too—when he communicated six times across the Atlantic on 1.75 mc. last winter. Although mention has been made in the BULLETIN of this feat, we have not been able to tell the full story owing to the absence of complete information. Now that a detailed log has come to hand from G5WU, we are not only able to give a summary of his contacts with U.S.A., but are able to print some exceptionally interesting theories that are deserving of attention by all readers.

SOME HISTORY

Let us recapitulate a moment. Transatlantic communication on the old 200-metre band took place on several occasions during the winter, 1922-23. But when distance work on 100 metres and below was found to be easier, the longer bands were neglected.

Then, ten years later, Group 10A, of the former Contact Bureau section of the R.S.G.B. decided on an attempt to repeat the successes of yesteryear. Throughout December, 1932, watch was kept on 1.75 mc. for half a dozen American stations who had agreed to co-operate. No contacts were made, so the tests were repeated in February and March, 1933. Mr. A. Forsyth (G6FO) (then a member of Group 10A and now G.C. of Group 1B) opened up two-way communication from his station, situated at that time in Newport. He worked W1DBM of North Falmouth, on Cape Cod. Two other U.S. amateurs were also heard by the Group.

A year passed. Further tests were arranged by W1DBM in the States and G5UM over here. They were not publicly announced, in order to keep off the ether people unwilling to co-operate in a serious, organised experimental effort. A dozen leading British stations specialising on 1.75 mc. work were informed, in addition to the six members of Group 10A. In America, though, news of the tests leaked out through *Q.S.T.*, and brought literally hundreds of W stations on to the 1.75 mc. band in the vain hope of working England. They choked themselves by sheer weight of numbers; their practice was to send snapshot CQ's, listen for a couple of minutes and then transmit again.



Here is the record-making apparatus used by G5WU. Left to right: push-pull TPTG transmitter, aerial impedance matching network, receiver.

If they had co-operated with W1DBM, the 400-watt control station, they would have learned that 15-minute periods of transmission and reception were being observed, and that the 1,715 to 1,800 kc. telegraphy band only was being watched. Crowds of hopefuls, even as far away as America's Mid-West, called "CQ Great Britain" on the 1,800-2,000 kc. telephony band, oblivious that the British participants were solely concerned with CW.

By the regular schedule, several selected American stations, under the lead of W1DBM, commenced transmission at midnight E.S.T., every week-end. Amateurs this side of the Atlantic braved the rigours of winter mornings and rose at 5 a.m. to try and receive them. Over a dozen stations in the First, Second, Third and Eighth districts were heard by the various British listeners, and G5WU worked W1DBM four times, and W1BR and W1CHV once each, getting R2-3 average. A seventh contact (with W1ATE) was nearly made on March 17, as the log, reproduced below, shows. Further, VE1AO heard him. Inputs used were 1,000 watts by W1BR, 200 to 400 watts by W1DBM, and 75 watts by W1CHV and W1ATE.

Apparatus Used

Most outstanding of all was the fact that the input at G5WU never exceeded the maximum of 10 watts to which British stations are limited on 1.75 mc. A push-pull transmitter was used, with a most unorthodox aerial (see p. 297, March, 1934, T. & R. Bulletin).

The first two contacts were made with loose-coupling and parallel-tuning of the aerial system: the remainder were made with an impedance-matching network. The receiver used is a battery S.G.-V-1.

Now follows the complete log, together with Mr. Low's remarks:—

20/1/34 *Full Moon* 30/1/34.

21/1/34 Bar. steady 30.5. QRN severe.
Weather perfect, clear sky, hard frost, no wind. Heard station calling test on both days between 6.30/6.45 a.m. Completely spoiled by QRN.

27/1/34 *Full Moon* 30/1/34.

28/1/34 Bar. 30.2 to 30.3. QRN strong and persistent.
Weather cloudy to clear. Hard frost, no wind.
No trace of W signals.
Full Moon 30/1/34.

3/2/34 Bar. steady 30.5. QRN intermittent crashing variety.
Weather cloudy, frosty, no wind.
W1DBM R5. Contact 6 a.m.

4/2/34 Bar. 30.4. Conditions similar to 3rd, except cold, but no frost.
W1DBM and W1CCX heard. Contact at 6.30 a.m. with W1DBM; his signals are only R2.

10/2/34 *Full Moon* 30/1/34. *New Moon* 14/2/34.
Bar. 30.2 steady. QRN steady R7.
Weather: heavy clouds, slight drizzle, no wind.
W1DBM heard R1-2.

11/2/34 Bar. 30.5, rise. QRN steady.
Weather: damp fog, no wind.
W1DBM R6-8, a F.B. signal, also heard W1CCI, W2DVY.

17/2/34 *New Moon* 14/2/34.
Bar. 30.7. QRN intermittent crashing variety.
Weather: slight fog, cloudy, cold, no wind.
Nil heard.

24/2/34 *Full Moon* 1/3/34.
Bar. 29.9. QRN steady R5.
Weather: light fog, cloudy, but air appears dry; no wind.
W1DBM R3, signals badly broken.

25/2/34 Bar. 29.65. QRN jerky R5.
Weather: heavy clouds, no wind.
W1DBM R7, strong; also heard W8BFN and W1AGB?
Conditions seemed ideal, but faded completely with daylight.

3/3/34 *Full Moon* 1/3/34.
Bar. 29.7, rising. QRN mild, occasional crashes.
Weather: scattered heavy clouds, light wind with rain squalls.
W1DBM R4-7 and W1CHV R1-2; contact both 6 a.m.

4/3/34 Bar. 30.2, rising. QRN steady R7.
Weather: light clouds, frosty, no wind.
W1DBM R1-2 and R3-6 after daylight.

10/3/34 *Full Moon* 1/3/34. *New Moon* 15/3/34.
Bar. 29.4, dropping. QRN R4 steady and mildest experienced.
Weather: cloudy, light wind.
W1DBM heard 5.37 a.m. R2-7, QSB very prominent.

11/3/34 Bar. 28.6, dropping. QRN very slight.
Weather: cloudy, springy atmosphere, no wind.
Heard no W stations. No kick in any signals.

17/3/34 *New Moon* 15/3/34.
Bar. 28.5, rapid fall. QRN mild, but heavy crashes.
Weather: cloudy, stormy, some rain squalls, windy.
W1BR R8. F.B. signal, very slow fading.
W1DBM R7. Similar.
W1CHV R2.
Also heard W1ATE R3 and W1COL R2.
Contacts with W1BR and W1DBM.
W1ATE advises hearing signals, but unreadable.
These contacts happen to be two days after *New Moon*, which completely upsets my "Moon on the wane" ideas.

After very carefully perusing my log and in view of the fact that contacts were made with American stations, a brief summary of barometer readings, QRN and weather may be of some interest. The following can hardly be termed conclusions, but I look upon them as points worthy of further consideration:—

1. I used a barograph throughout and can find no definite connection except the strange coincidence that the barometer was high when the contacts were made with the Moon on the wane and exceptionally low, 28.5, when the contact was made two days off *New Moon*, *i.e.*, 17/3/34.

2. The Moon theory of best DX when on the wane, in which I was keenly interested, has been completely upset by the above New Moon contact, more particularly because I consider March 17 was the best DX day throughout the Tests.

3. Temperature and ordinary weather conditions do not appear to have any direct bearing on the results.

4. *QRN* has never really attracted my attention in relation to DX, but my log on this occasion has brought to my notice an astonishing fact, namely, that on only five mornings my records show QRN of *crashing variety*, and on four of these occasions contacts were made. I am now interested to know whether W1DBM was on on the remaining day, that is, 17/2/34. This point seems to be of considerable interest and will be watched more closely in future.

5. My aerial system appears to be non-directional; if it is directional, then theoretically signals are strongest West to North and West to South. If the former, which is the shortest distance to W1DBM, then signals have to pass over nearby trees, across Wales and Ireland; if the latter, then almost direct down Bristol Channel to open sea, the longer way over. G6YJ (Newport) is similarly placed, so that this disturbs a possible theory of inland stations in this country being at a disadvantage. If, however, this disadvantage is established, then obviously my signals passed southwards over the longer route.

6. In view of the fact that all British stations were limited to low power, is it not strange that G6FO, when he made contact last year, was also using a push-pull self-excited oscillator identical to my transmitter, whereas I understand all members (other than G6YJ, who used both methods) had controlled power amplifiers. I believe it is claimed that, theoretically, the P.A. puts out more RF than a self-excited circuit for a given input, but strangely enough here is some evidence that it lacks the punch watt for watt.

I must here admit that with each aerial system introduced, I spend many hours on very low power searching for a particular point of resonance which, in the monitor, gives a type of note which I am able to recognise as particularly desirable.

We do not intend to embark on a lengthy discussion on G5WU's observations—these columns are open for everyone else to do so—but Remark No. 5 calls for some comment. Among the Americans heard by several British stations was W8BFN, nearly 400 miles inland. Situated over by the Great Lakes, he would appear to have stood little chance of being heard over here. The fact that he *was* heard seems conclusive proof that stations situated inland suffer no disadvantage compared with coastal amateurs.

Lessons of the Tests

These tests were not organised as a mere stunt. Primarily, they have shown that conditions on 1.75 mc. are approaching a period of exceptional

(*Continued on page* 46)

"SOLILOQUIES FROM THE COW-SHED."

By Uncle Tom.

(Sticking straws in his hair, the wise old Unc. succumbs to an attack of Field-Day-itis.)

I HAVE found out why it is that I have always noticed something missing from my location. The old shack is all very well—surroundings truly rural, and so forth, but it hasn't got that farmyard atmosphere.

I will lay a bad half-crown to a good ha'penny that the characteristic odours of Jones' Farm were worth more than 20 points to the No. 7 District " B " station on N.F.D. !

This Field-Day business is quite good fun, except for the poor mutt who volunteers to drive a large and heavy party round the countryside paying calls on all the stations they can get to. (Your Uncle was the mutt.)

The most exciting bit of news that arrived was brought to me by telegram on the Friday night. It read " South London repented. Two stations running by to-morrow. Will post QRA's later." This was good ! South London had really awakened from its ten years of sleep, and had decided to come into line.

Since our anonymous correspondent was evidently doing the whole show, I rang up the D.R., who agreed with me that he'd very much like to see it. He had no intention of jumping in and bagging the credit from this anonymous live-wire.

Early on Sunday we set forth, having received the information that South London's " A " station would be found on the escalator at Morden tube station.

We sallied blithely forth, even unto Morden, but minute search of all the escalators failed to reveal anything resembling an " A " station. We concluded that they must be working on the underside of the escalator, and left them to it.

According to our sealed orders, the " B " station was rigged up in the centre of a haystack near Kenley aerodrome. It took us quite a long time to find a haystack. By the time we had nearly got to the middle of it an irate farmer appeared, so we decided to beat it and look at some of the more accessible stations.

South London's score is not to hand as yet, but I can definitely say that but for the large amount of time we wasted looking for their stations, we should have seen more than we did.

Next port of call—No. 7 District's " B " station, in the charge of Ernie (" Quartz ") Dedman at the aforementioned Jones' farm. The royal party was greeted with the clicking of shutters and the hiding of bottles (the non-radio variety). Not one ham there was *gentleman* enough to offer us a drink, but G2YL quickly summed up the situation and saved it with a few minutes to spare. The picture adorning this page shows the scene of animation at the entrance to the station buildings !

The large bulk in the centre belongs to G2DC, while the object with the glistening eye-balls just behind him is G2NH. Somewhere in the darkness is a transmitter and perhaps a receiver as well.

Followed a call *chez* G2YL, by courtesy and invitation of the owner-operator. In the course of this we discovered, amongst other things, how easy everything is made for No. 7's " B " station by the presence of an active YL in the district. But let us draw a veil over eats and drinks (even as they did over the bottles when they saw us).

Next port of call, Farnham, Surrey, with only a very hazy idea as to where the station hangs out. After devious wanderings along incorrect roads, lanes and footpaths, we eventually saw a sign reading " OSRAM VALVES "—No. 7 District R.S.G.B.—N.F.D., near the entrance to the park."

Ernie Dedman (G2NH) effects a local QSO at No. 7 District N.F.D. station, Walton-on-the-Hill, Surrey.

Thenceforth all is truly rural—stiles, cows, more cows, nettles, more cows, and finally a palatial station manned by three active hams and guarded by one of the inert variety stretched on a camp bed.

Properly built in rigid fashion inside a football pavilion, with a nice aerial of quite the maximum height and a counterpoise with the washing hanging out on it !

Here we ran into SU1MM, who had been doing shifts with the others. G6NA never took the 'phones off to speak to his Uncle, so engrossed was he with the prospect of raising a VK on 160 metres. (They did raise a VO on 80 !)

But the military discipline of the station ! All ops. clocking on, working regular hours, anyone not opping ordered outside, and so on. No wonder they piled up points. None of your Sunday-afternoon-social about them !

While we lunched in Farnham their worthy chief,

(*Continued on page* 46)

Technical Articles are Wanted

STATION DESCRIPTION No. 42

ZL4BT

[We have pleasure in publishing a description of ZL4BT, the winning station in the last Senior B.E.R.U. Contest.]

ZL4BT—Jack Callendar—winner of Senior BERU Contest, 1934.

ZL4BT was first licensed in May, 1930, the initial outfit consisting of a P.P.T.P.T.G. transmitter using Type 201A receiving tubes, with an input of about five watts. A simple detector and one audio receiver was used.

After the compulsory period which all N.Z. stations are required to put in on 3.5 mc., the higher frequency bands were exploited, using a Hartley with 180 watts input to a 75-watt type 852 tube. Results were perfectly satisfactory, but as a result of the gift of a crystal, a simple C.C. transmitter was constructed for 3.5 mc. work. In 1932 the complete reconstruction was carried out, making a four-stage transmitter consisting of a Pentode C.O., Pentode F.D., 7½-watt B.A. or F.D., with the 75-watt tube as final P.A., this being one of the first multi-stage C.C. transmitters in the Otago District to operate on the DX bands.

With the advent of tritet oscillators during 1933 the low-power stages were re-arranged so that a tritet oscillator could be used, making it available for use either as a crystal-controlled oscillator, or as an electron-coupled oscillator, with the output circuit tuned to harmonics of the grid circuit.

At the same time, an A.C. Super-het receiver was constructed, incorporating regeneration in the I.F. stage, giving single signal effect. This receiver uses one R.F. stage, first detector, H.F. electron-coupled oscillator, one I.F. stage, electron-coupled beat oscillator, and pentode second detector, giving adequate headphone strength.

Power supply equipment consists of three packs giving 250, 600 and 1,500 volts respectively, the 250-volt supply being used to provide oscillator plate supply, grid bias for the three amplifier stages, and plate supply for the receiver.

ZL4BT has done some work on phone, using both plate and grid modulation systems. As phone work is confined to 3.5 and 1.7 mc., the contacts are mainly inter-provincial and Australian.

This station took part in the 1933 Junior B.E.R.U. Contest, and owing to the disheartening conditions prevailing then, had determined not to take part seriously this year. This decision still stood until three days previous to the contest, when ZL4AI, who was indisposed by illness and had previously made all arrangements to participate, came along and declared that ZL4BT must take part in his stead. The transmitter, as used in the contest, consisted of tritet C.O., Pentode B.A. or F.D., P.P. Pentode B.A., and P.P. 75 watters. A centre-fed 33-ft. vertical and 33-ft. horizontal aerial, series-tuned on 7 mc. and shunt-tuned on 14 mc., was used. The aerial may not have been particularly efficient, but as the Empire zones were distributed in all parts of the globe, equal radiation in all directions was the main essential. This type of aerial had proved its worth in previous contests, and has been in use since 1931 at this station. The main consideration was to receive overseas signals to best advantage, so various directional aerials were tested out on the receiver, until two at right angles were selected as suitable. These presented a striking contrast in reception properties, one being ideal for evening reception, the other one at right angles being suitable during the morning period. Evidence of their satisfactory operation was gained when it was noted that signals quite readable on one were inaudible on the other, while during the evening hours the aerials had to be changed over in order to bring the same stations up to a readable level.

The contest brought forth some unexpected thrills, of which may be mentioned a daylight QSO with VS6AE on 14 mc. in mid-afternoon. Then there was the thrill of hearing G signals breaking through on 7 mc. as early as 14.45 G.M.T., that of G2NM being outstanding. At the other extreme, was the delight at hearing G6WY as early as 05.00 G.M.T. on 7 mc. in summer! Mention might also be made of VP5PZ, who seemed capable of getting through at all hours, and who must have been one of the most popular stations on the air, judging by the numbers who were frantically calling him.

ZL4BT has been a member of N.Z.A.R.T. since 1928, when the Otago Branch was reorganised. Appointments in the past have included: N.Z.A.R.T. Official Guard Station, Telegraphist in Radio Emergency Corps, and Secretary to the Otago Branch, N.Z.A.R.T. Awards comprise Certificate of Merit in N.Z.A.R.T. Guard Station Contest, 1931, N.Z. zone winner, B.E.R.U. Junior Contest, 1933, W.A.C. and American R.C.C. Some 65 countries in all parts of the world and throughout the Empire have been contacted.

Strays.

K6COG, Pearl City, Oahu, Hawaii, in a QSO. with G6QX, reports excellent conditions for European DX. He hears consistently G2MA, 2OS, 6HP, 5YG, 5YH, 2BM at good strengths, and would like to QSO these stations. His frequency is 14,304 kcs. CC input, 200 watts, QTU 05.30-07.30 G.M.T.

On the score of economy, SU1EC asks us to state that he is unable to acknowledge reports from British listening stations. During May he received 60 cards from such stations, many of which were of no value.

Mr. T. Martin, G2LB, reports that a pirate, believed to be in Gateshead, is using his call. He will be pleased to send him the cards he has collected if he will write to him at 3, Gladys Road, South Yardley, Birmingham.

A QSL File.

By A.E.D.

The following description of a (possibly) new way of accommodating QSL cards may be of interest to some members.

The basic idea underlying the method is to use the principle of the wall-paper pattern book in a loose-leaf form.

In the writer's case, a size of 48 ins. by 36 ins. was adopted for the paper sheets used, as it was found that five cards, suitably spaced, could be accommodated, lengthwise, along the 36 in. width.

Accordingly, two pieces of ¼ in. wood, 36 ins. long and 4 ins. wide, were drilled with ¼ in. holes at points respectively 2 ins., 18 ins., 34 ins., along the lath, each being 2 ins. from each of the longer edges. In order that correct register might be obtained, the two pieces were clamped and drilled together. One of the pieces was then counterbored to accommodate the heads of three coach screws about 3 ins. long, which were forced into the holes from the same direction. The same piece of wood was provided with means of attachment to the wall. To prepare the paper, which is of the brownish wrapping variety, and can be bought at about 1d. per sheet, a circular punch was made to pierce a hole about ⅜ in. diameter in order to clear the bolts.

The remaining piece of drilled wood will prove useful as a template, although in this case it will be necessary to enlarge the three holes to accommodate the punch.

All that is now necessary is to punch the paper with three holes 2 ins. from one of the 36 in. edges, and then paste the QSL cards on to the sheet, which will be found large enough to accommodate 45 cards of the usual dimensions. The sheets are then filed on the bolts followed by the template.

Three butterfly nuts are run on the bolts to hold everything tight. A very large number of cards can be accommodated in this way, and each card is readily available for inspection.

It is advisable to leave a good margin at the top of the sheet as, if it is filled to capacity there will be a tendency for the top row of the bottom sheets to be masked as the sheets grow numerous.

Finally, be sure the attachment to the wall is substantial, or alternatively, don't keep anything you value beneath it!

Low Power Contest 1934.

THIS interesting little contest had its usual supporters, and the results obtained again demonstrate that even in these days of crowded bands much useful work can be achieved using low power.

The rules for this event stated that the voltage to be applied to the valve or valves delivering power to the aerial, was not to exceed 100 volts, and the underlying idea of the contest was, of course, to test the efficiency of low power stations. As was pointed out in our recent editorial certain members used more than 100 volts on previous stages, but as the rules did not specify a limit for sub-stages all entries were accepted.

The winning station operated by Mr. F. Robb, GI6TK, succeeded in amassing the remarkable total of 202 points obtained from 61 contacts, 30 of which were with North American stations.

Mr. H. G. Collin, G2DQ, secured second place with a score of 175 points, most of which were gathered from 3.5 mc. contacts. This station has already demonstrated its efficiency in previous contests, and the operator is to be congratulated on obtaining such outstanding results when using a much lower input than was used in the 3.5 mc. contest. Third place was won by Mr. R. A. Sproule, GI2SP, with a score of 100 points.

The following is a list of all other entrants, together with their scores :—

		Pts.
4.	R. D. L. Dutton, G6QQ	98
5.	J. P. Stove, G5ZX	83
6.	J. G. Stonestreet, G2JN	77
7.	E. Knowles, G2XK	66
8.	A. Boa, G5BO	43
9.	L. Hill, G5WI	39
10.	A. Pemberton, G2JY	26
11.	W. Storer, G6JQ	21
12.	W. Cargill, G5LR	18
13.	E. H. Swain, G2HG	11
14.	K. Harvey, G5KT	5

Apparatus Used.

Details of the apparatus and power used at the first five stations follows :—

1. GI6TK. Transmitter : 3.5 and 7 mc. T.P.T.G. with P650's 14 mc. push pull with P650's. Input 4.8 watts on 14 mcs. 3.0 watts on 3.5 and 7 mcs. Receiver, S.G.-Det-Pen. Aerial end fed Hertz, 30 ft. high 66 ft. long, Zepp fed on 14 mc.
2. G2DQ. Transmitter E.C.O., F.D., B.A., F.D., P.A. Input 1½ to 2 watts from receiver H.T. unit with series resistance. Receiver, superhet and 3 valve straight. Aerial 132 ft. Zepp fed.
3. GI2SP. Transmitter, M.O.P.A. Input 6 watts. Receiver, Pen. Det. and L.F. Aerial, 66 ft. Zepp, with 29 ft. feeders.
4. G6QQ. Transmitter C.O. locking T.P.T.G. using PX4. Input 2 watts. Receiver 0-v-1. Aerial 7 mc. 66 ft. A.O.G. 3.5 mc. " G5QY " type.
5. G5ZX. Transmitter, C.O.-CT25X (3 watts) B.A. P625 (10 watts), PA-2-T25D in push pull. Input 5 watts. Receiver untuned S.G. H.F. S.G. Det-Pen. Aerial 66 ft. Zepp and 45 feeders.

All competitors are thanked for their interest.

A Field Day with Portable G6UT.

By DUD-CJ.

YOU have all heard tales of exciting adventures when District 14 has decided to have an alfresco week-end, and I have just had the good fortune to be invited to the latest of these famous field days. One Saturday we set forth from G6UT, full of hope and dinner, loaded up with all sorts of radio and butchers' products, Rookwood

Hall, the scene of many a campaign, being once more the object of our immediate researches. I said researches because the place is inaccessible without a good guide, and these are very rare. The QRA is in the heart of Essex, about five miles beyond Epping as the crow flies, but about twenty according to my speedometer, down miles of treacherous, tortuous, tongue-twisting country lanes. The weather was true to the spirit of the thing, and we all set forth in the heaviest rain we had seen for many moons.

Rookwood Hall, as I found it, consists of a patch of thick mud about 100 yards square, containing a farmhouse and numerous accessory buildings containing cattle byres in cascade, and all sorts of complicated feed arrangements; the yard was, however, self-excited, for here and there the mud assumed a definitely "farming" aspect, but I was assured that it was all quite healthy. The whole is surrounded by a patch of somewhat thinner mud, called the moat, for apparently the place dates back to the days when QRU was avaunt! and odds boddikins meant hi! In spite of a very Tudor aspect, however, I could find no

G6LL, exponent of cooking a la Field Day. A recent indoor study taken at Abbess Roothing, Essex. District 14 Meeting.

evidence of radio having been used there in those days, although it is asserted with confidence that good Queen Bess used the Hall as a QRA on occasions.

There is a cottage, a modest cottage, furnished, but unoccupied. The staff of the station consisted of G6UT and G6FJ (chief ops), G6LL (chef), 2APS, 2AVU and G6SG (chief QRM), with G6MN and myself (chief visitors).

Fortunately the aerial was mainly in existence, so that after a certain amount of prodding inside a large black coffin we had brought with us it was announced that we were on the air, and, lo and behold! immediate contact was established with PA O FY, late member of the district, and, I believe, inventor of the Anglo-Dutch Field Day previously recorded in this Journal. I will not attempt a technical description of the gear, as I do not understand these things very well. I originally thought the black coffin was something to do with the sausages we had for staple diet, but it certainly seemed to make plenty of noise over the ether.

Sunday morning brought fine weather, but left us muddy. Lots of QSO's were made on 1.7 and 3.5 mc., in fact, after repairing a large pair of thigh boots we actually got across the pond. We received by radio the famous records made at G2LZ, one of ZL4AO, and the other of a district meeting, and then the visitors started coming over to find out what all the row was about. They were numerous and distinguished. We had G2LZ and YL, then G5AR (the man in the cap), 6 Feather Beds (or flowing beards). Later G2KT arrived on a small $\frac{1}{8}$-h.p. spit and miss, followed by G5RV and 2SA.

And Oh! the grub! About every four hours the chef produced a large quantity of hot dogs, and an impossible quantity of fried eggs, good in parts like the curate's. We had, however, to go about four miles down those horrid lanes to get *substantial* nourishment.

Apart from the radio, Rookwood Hall has other attractions. For example, the air is good, and there is some good shooting. In fact, if we had taken another half gross of cartridges with us we might have given the chef something to try his skill on.

And so, as the papers say, a fb time was had by all. I would like to repeat the warning about the guide, however, for the place only communicates with the outer world by radio. I lost the party coming out, and, believe me, the clock showed fourteen miles when I did hit a main road, and then it was the wrong one; moreover, having found it, I then discovered I'd left an overcoat behind. It's there still!

Gas Mains and Radio.

By E. H. Swain, G2HG.

NO, this is not an article giving a long-awaited solution of how to get transmitter H.T. from the gas mains! Yet gas mains *can* affect radio—but in a perturbing, not a pleasant, way.

Quite recently, the writer required to find a temporary earth for the receiver, and accordingly connected a wire to a disused gas pipe in the radio room. Immediately, interference on a BCL set in another part of the house became so bad that listening was impossible, but as soon as the connection was removed the trouble ceased.

Further tests revealed that if a wire were connected to the gas point and brought within three feet of the ten watt transmitter, the interference started once again. It should be added that the broadcast set has a very good outside earth connection, and the nearest gas pipe is seven feet distant.

This experience would lead one to believe that interference to neighbouring broadcast sets may be caused by the transference of RF energy along gas pipes. The phenomenon is familiar where electricity mains are concerned, but few amateurs would look to gas mains for the trouble.

Technical Articles are Wanted

EMPIRE CALL SIGN ALLOCATIONS.

In his Presidential address, Mr. Arthur Watts commented upon a proposal on hand to prepare a complete list of International Amateur Prefices for use in the British Empire. Council's approval having been obtained, the list has been sent to all B.E.R.U. representatives and interested overseas members.

At the moment difficulties arise through amateurs using a similar type of prefix in widely separated parts of the Globe, and whilst it is admitted that in most cases no serious inconvenience is caused, we believe that all amateurs will appreciate the desirability of assigning definite prefices for each part of the Empire.

In general the scheme is aimed at grouping all islands and territories adjacent to a specific continent under similar prefix allocations, *e.g.*, the series VP will cover islands and territory associated with America. In certain countries no amateur activity is taking place at present, but at a later date, when amateurs commence work in those countries, their stations will be recognised immediately, providing the list is universally accepted.

Our object in reproducing the list at this stage is to enable other members who may be interested to give us their views prior to October 1st.

Now.	*Suggest.*
	AMERICA.
VE Canada	VE Canada
VO Newfoundland	VO Newfoundland and Labrador
VP4 British Honduras	VP1 British Honduras
	VP2 Leeward and Windward Is.
VR1 British Guiana	VP3 British Guiana
VP4 Trinidad	VP4 Trinidad and Tobago
VP5 Jamaica	VP5 Jamaica, Cayman Is., Turks and Caicos Islands
VP6 Barbados	VP6 Barbados
VP7 Bahamas	VP7 Bahamas
	VP8 Falkland Is. and S. Georgia
VP9 Bermuda	VP9 Bermuda
	AFRICA.
SU Egypt	SU Egypt
ST Sudan	ST Sudan
	ZD1 Sierra Leone
ZD2 Nigeria	ZD2 Nigeria and Cameroons under British Mandate
	ZD3 Gambia
	ZD4 Gold Coast and Togoland under British Mandate
VP1 Zanzibar	ZD5 Zanzibar
	ZD6 Nyasaland
	ZD7 Basutoland
	ZD8 Bechuanaland
	ZD9 Swaziland
ZS, ZT, ZU } 1-6 S. Africa	ZS, ZT, ZU } 1-6 S. Africa
ZE1 S. Rhodesia	ZS8 South-West Africa
VQ2 N. Rhodesia	ZU9 Tristan da Cunha
VQ3 Tanganyika	VQ1 or ZE1, S. Rhodesia
VQ4 Kenya	VQ2 N. Rhodesia
VQ5 Uganda	VQ3 Tanganyika
	VQ4 Kenya
VS9 Seychelles	VQ5 Uganda
	VQ6 Somaliland
V8 Mauritius	VQ7 Seychelles and Dependencies
	VQ8 St. Helena and Ascension
	VQ9 Mauritius and Dependencies (includes Chagos Archipelago)
	ASIA.
VS1 Straits Settlements	VS1 Straits Settlements
VS2 Fed. Malay States	VS2 Fed. Malay States
VS3 Non-Fed. Malay States	VS3 Non-Fed. Malay States
	VS4 Sarawak and N. Borneo
	VS5 Labuan and Brunei
VS6 Hongkong	VS6 Hongkong
VS7 Ceylon	VS7 Ceylon
	VS8 Bahrein Is. and Khuria Muria
	VS9 Aden, Perim Is., Kamara Is., and Socotra
	VU1 Maldive Islands
	VU3 Andaman and Nicobar Is.
VU2 and 7 India	VU2, 5, 6, 7 India
	VU4 Laccadive Islands
	VU9 Burma
ZC1 Palestine	ZC1 Palestine
	ZC2 Cocos Islands
	ZC3 Christmas Island
	ZC4 Cyprus
ZC6 Transjordania	ZC6 Transjordania
YI Iraq	YI Iraq
	OCEANIA.
	VK1 Norfolk Island
VK2, 3, 4, 5, 6, 8, Australia	VK2, 3, 4, 5, 6, 8 Australia
VK7 Tasmania	VK7 Tasmania
VK9 New Guinea & Papua	VK9 New Guinea and Papua
ZL1, 2, 3, 4, New Zealand	ZL1, 2, 3, 4, New Zealand
	ZL5 Chatham Islands
VP1 Gilbert & Ellice Is.	VR1 Gilbert and Ellice Islands
VP1, VP2 } Fiji	VR2 Fiji
VQ1 Fanning Island	VR3 Fanning Island
	VR4 British Solomon Islands
	VR5 Tonga Islands
	VR6 Pitcairn Island
	VR7, 9, other Pacific Islands under British Government
ZK Cook Islands	ZK1 Cook Islands
ZM Samoa	ZK2 Samoa and Union Islands
	ZK3 Nauru Is.
	ZK4-9, other Pacific Islands under N.Z. Government
	EUROPE.
G England, Scotland, Wales, Channel Is., Isle of Man	G England, Scotland, Wales, Channel Is., Orkney Is., Shetland Is., Isle of Man
GI Northern Ireland	GI Northern Ireland
EI Irish Free State	EI Irish Free State
	ZB1 Malta
	ZB2 Gibraltar

Corrections.

One of our observant readers in North London (G5AM) discovered *three* errors in our Birthday issue. On page 400, under lectures, the name McLaughlan should read McLachlan. On page 433, column 2, 12 lines from bottom, "75 mcs. and 110 ms." should read "75 and 100 metres." On page 433, column 2, last line should read "rather than abnormally low penetration of ionisation."

In Fig. 1 of the article on the 10 watt telephony transmitter, on page 410 of the June issue, the wire from the common point of the modulation transformer is shown connected to negative H.T. This should, of course, be taken to positive H.T. 400 volts.

Miss B. M. Dunn, G6YL, advises us that she is willing to stand by for schedules with any station working on 28 mc. During the past few weeks a large number of local European signals have been heard by her on this band.

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.

HIGH ANGLE RADIATION.

The Editor, T. & R. Bulletin.

Dear Sir,—In the January issue, Mr. Mathews (G5AM) has commented on my letter dealing with high angle radiation, which appeared in the December issue. I hope that this letter will help to clear up the points raised.

The account of short-wave theory applied to DX work, given in my last letter, was only intended to be a brief summary of some work published in America, and admittedly it was difficult to follow for one unacquainted with the articles that appeared in QST some time ago. The main point in my letter was the suggestion that the effect of the E-layer on a wave, say of 28 mc. frequency, which completely penetrates the layer, is to bend the wave considerably away from its original course. G5AM reasons that such a wave would, after passing through the region of maximum ionic density, be bent back towards the normal, so that the resultant bending is small. This would be correct if the ionisation density fell off to a very low value on the upper side of the layer in a manner opposite to the building up of ionisation on the lower side—that is, if the E-layer ionisation were symmetrical about the zone of maximum ionic density. But it is more likely that the ionisation gradient, after the zone of maximum density is passed, although negative, is only small, so that when the minimum between the E-layer and the next layer is reached, the ionic density is of a value only slightly less than that of the maximum of the E-layer. In these circumstances, a wave of a certain frequency, radiated at a high angle, may be bent almost 90 degrees from the normal, while in the lower part of the layer, and then be bent back only slightly in the upper part of the layer. A wave passing through the E-layer under these conditions would certainly impinge on the F-layer at a lower angle. I am of the opinion that this effect may occur to some appreciable extent on frequencies as high as 28 mc., although G5AM doubts that the E-layer is of any importance below 80 m.

In making ionospheric investigations, echoes are usually observed from rays projected almost vertically upwards. For normal E-layer conditions there is a certain critical penetration frequency in the vicinity of the 3.5 mc. band, above which all waves completely penetrate the layer. Possibly this is what G5AM had in mind when he made the statement about the unimportance of the E-layer. But in DX work in actual practice, the rays radiated near the vertical are useless, and a wave which would penetrate the layer at vertical incidence may be completely refracted back to earth if radiated at a lower angle. It is probable, therefore, that the E-layer, particularly in the daytime, is of some importance for waves radiated at the usual low angles on 7 mc. and 14 mc., and it is probably still important for the waves radiated at higher angles, and for frequencies as high as 28 mc., although these waves may not be reflected.

The *two* critical angles referred to are not connected with two different layers ; they are explained clearly in Rice's work. At the time these articles appeared in QST, only the Kennelly-Heaviside layer was known. The values for layer heights and densities now require revision, but the same arguments still hold. The skip-distance ray corresponds to the first critical angle for the lowest reflecting layer. The second critical angle corresponds to the ray above which reflection ceases, and this is not the skip-distance ray. The amount of bending suffered by a ray in an ionised layer depends not simply on ionic density, but on the ionisation gradient. As the zone of maximum density is approached from below, the gradient diminishes, and is zero where the density is a maximum.

Now, as the angle of radiation is increased, the rays penetrate deeper into the layer. At the first critical angle, the ray returns to earth at the nearest point to the transmitter. For higher angles, the rays penetrate into a region where the ionic gradient is positive but decreasing, consequently the amount of refraction is smaller, and the ray returns to earth at a distance greater than the skip-distance. The second critical angle is that which must be exceeded if the ray is to penetrate the layer completely. The rays, on ordinary frequencies, which " come down somewhere in between and don't matter much " thereby puzzling G5AM, are the rays slightly higher than the skip-distance ray, which arrive back on the earth between the points of return of the skip-distance and tangent rays.

On 28 mc., however, the rays of comparatively high angle are of interest, because it appears that they can at times return to earth while the low-angle rays are lost.

Yours faithfully,
H. W. Wheeler (VK5HW)

" REPORTS WANTED " SECTION.

To the Editor of The T. & R. Bulletin.

Sir,—Now that Contests are over for this season, I am forwarding a suggestion, which may possibly appeal to many members. That is to have " Reports Wanted Section " in the Bulletin.

Hitherto notifications of those desiring reports have been tucked away in odd corners under the heading of " Stray." My idea in suggesting this will, I hope, encourage intelligent " qssling," and at the same time indicate to BRS and BERS men those who will appreciate reports and acknowledge them.

The details for this section could be drawn up in calendar form as below :—

Date.	G.M.T.	Station Freq.	Remarks.

The last column would contain such information as c.w. fone, power, zone required, etc. Details would of course be published fairly well in advance, and thus give members overseas the maximum opportunity to contact and report. I should imagine that 28 mc. and 56 mc. enthusiasts would welcome such a medium for notification.—Yours sincerely,
R. G. Norman (G5DP).

[Those interested in this suggestion are asked to communicate direct with Mr. Norman.—Ed.]

Technical Articles are Wanted

RELATIVITY AND ELECTRO-MAGNETICS.

To the Editor of THE T. & R. BULLETIN.

DEAR SIR,—I wish to thank Mr. Everett (ZT6U) for his excellent article on " Oscillations, Waves and Wave Motion " in the April, 1934, issue of the T. & R. BULLETIN.

If I may be permitted to make a few comments on this paper, I would like to mention that in the section entitled " Relationship between Types of Waves " (top of page 319), it is stated that " its numerical value found to be 3×10^3 centimetres per second." This should read " 3×10^{10} centimetres per second," as mentioned lower down in that paragraph.

Secondly, as Sir Oliver Lodge and other eminent authorities have pointed out, it has been the fashion in recent times for physicists and others to deny or ignore the existence of the ether, and in consequence to disregard the two ether constants K and μ, as used in Maxwell's formula $\frac{1}{K\mu}$ in which it is supposed that the electrostatic constant K is a measure of the elasticity of the ether, and the magnetic constant μ is a measure of the density. This is a general supposition, and the value of neither constant is as yet known, but this is a passing phase which should disappear directly we have the means of determining the value of these two etherical constants and the ether's reputation will be then firmly established.

This point and many others are dealt with by Sir Oliver Lodge in some recent theses and articles, and should anyone be interested in this fascinating and important subject, they might refer to " Atoms and Rays," " Ether and Reality," and " The Ether of Space," all by the aforementioned author, some of which are published by Ernest Benn, Ltd.

Yours faithfully,
D. ALDOUS, A.B.R.I.
(BRS1006).

[The Relativity theory has now, we believe, satisfactorily explained electro-magnetics, but until this subject is sufficiently well understood, we consider it is better to use the old " mechanical ether " theory.—ED.]

ATMOSPHERICS

To the Editor of T. & R. BULLETIN.

DEAR SIR,—Mr. Gibson and I have exchanged correspondence as a result of two points arising from his article on atmospherics in the April issue of the BULLETIN. First, and of more importance to the article as a whole, I pointed out that Mr. Gibson seemed to imply that an electromagnetic wave might be " synthesised " by combining two *independent* components, one electric, the other magnetic. Actually, of course, this cannot be done; the two components of an electromagnetic wave are inseparably interconnected and, in any case, each component will vary at the frequency of the wave, thus ruling out the possibility of a *steady* field, such as that of the earth, having any such direct effect.

It seems, however, that Mr. Gibson did not intend his suggestion to be taken quite in this sense. Nevertheless, there would seem to be no physical means whereby the occurrence of a " non-directional damped wave " could be connected with the presence of a magnetic field; the only case of a magnetic field affecting wave propagation is that it may cause double refraction in an ionised medium. These remarks apply equally well to a simple wave and to the most complex wave obtainable, for the latter can ultimately be resolved into simple sine-wave components.

It would seem more logical to seek an explanation for the fact that " drift atmospherics " are more prevalent in tropical regions from the meteorological characteristics of such regions.

The second point discussed is, perhaps, a minor one and refers to Lieut. Macmillan's reception of medium-wave stations. I pointed out that it is generally believed that conditions in the troposphere have no *direct* effect on wave propagation; the only way in which pressure can affect propagation is that *in an ionised medium*—and not elsewhere—higher pressure corresponds to higher absorption (attenuation), and vice versa, a mere gradient having no effect of itself. Since it is unlikely that pressure variations extend up to regions of appreciable ionisation (above 80 kilometres), it is of interest to try to explain the conditions noted in terms of the presence or absence of storm clouds—a charged cloud *can* affect conditions indirectly by producing increased ionisation in the lower " E-layer."

Such interpretation of the weather map given might, perhaps, be made by someone better acquainted with meteorology than myself.

Yours faithfully,
A. T. MATHEWS, B.Sc. (G5AM).

DISTRICT NOTES *v.* R.E.S.

To the Editor of T. & R. BULLETIN.

SIR,—In expressing the following opinions, I am sure I have the silent support of many members of the Society.

For some time past the general character of District Notes seems to be altering, the tendency being to make them a record of the outstanding technical achievements in each district.

The idea is sound, but we have always regarded these notes as the social side of the BULLETIN and essential to its utility. They are rapidly becoming a rival to R.E.S., so why not remodel them to form a general section of R.E.S. ?

Obviously some rules must govern District Notes to obviate the possibility of them becoming too cumbersome, but at the moment the restrictions are having a detrimental effect upon members' monthly reports. There are always those who will not report monthly, but there are also others who do, and if month after month the gist of their reports does not appear in District Notes then they too will cease to report.

The D.R.s find themselves unable to make use of the monthly reports, as a rule, because they are not of sufficient importance under the present state of affairs. We might well wonder what constitutes an achievement of such magnitude as to be worthy of being recorded in District Notes.

Is the space for these notes really justified, or could it be used to better advantage ? If they are to continue why not allot a certain maximum number of words to each district and let the D.R.s make the best use of the space available. It would

make their task of running the districts much easier, and enable them to encourage any local activity.

It is a fallacy to state that amateurs only read the notes appertaining to their own particular district. I am only one of a great number who like to keep in touch with other districts and who consider District Notes as the finest medium.

In conclusion I should like to state that this is not a personal grievance, but the result of the subject having been raised by me at a recent district meeting.

Yours faithfully,
F. R. Canning (G6YJ).

(We are glad to publish Mr. Canning's views on the age-old subject of District Notes. For some years we attempted to record the personal achievements, however small, of all those who reported. As many members know, D.R.s were invariably compelled to "make up" notes due to lack of material. In view of this the more general type of notes were instituted at the request of the D.R.s who met at Convention two years ago.—Ed.)

DETERMINING ULTRA-SHORT WAVELENGTHS

To the Editor of T. & R. Bulletin.

Dear Sir,—I was greatly interested in the article by A. S. Clacy (G6CY) on "A Method of Determining Ultra-short wavelengths," in the April issue, as I was using a similar method last summer to calibrate a receiver for the 56 mc. amateur band. The advantage of the method to be described is that the only apparatus necessary, other than the ultra-shortwave receiver (U.S.W.R.) is a normal shortwave receiver (S.W.R.) having a wave-range from about 19 to 27 metres.

The procedure is as follows :—

1. With the S.W.R. oscillating, tune in Rome on 25.4 m. to the silent point.
2. Leaving the S.W.R. oscillating, tune in on the 5-metre band (U.S.W.R.) until the fifth harmonic is heard (silent point) on 5.08 m.

To determine whether the harmonic heard is actually the fifth, it is necessary to do as follows :—

While still listening-in on the U.S.W.R. tune the S.W.R. (still oscillating) downwards in wavelength from 25.4 m. until the next harmonic is heard.

If the U.S.W.R. is actually on 5.08 m. (fifth harmonic), then the S.W.R. will now be tuned to $25.4—5.08=20.32$ m. (or 5.08×4 m.). This wavelength can be checked against station WJX on 20.44 m. If, on the other hand, the harmonic is, say, the fourth $\left(\frac{25.4}{4}=6.3 \text{ m.}\right)$, then the S.W.R. will be tuned to $25.4—6.3=19.1$ m., which wavelength can be checked against 2XAD on 19.56 m. Similarly the sixth harmonic of 25.4 m. would give an overtone on $\left(25.4—\frac{25.4}{6}\right)=$ 21.2 m., which is in the amateur band.

By using the Rome station, the wavelength obtained on the U.S.W.R. is $\frac{25.4}{5}=5.08$ m. Of course, by using stations other than Rome, it is possible to obtain several points in the 5-metre band for the purpose of drawing a graph. For instance, the fifth harmonics of Moscow RNE (25 m.), Radio Colonial FYA (25.63 m.), and CT3AQ (26.83 m.) give respectively wavelengths of 5 m., 5.13 m., and 5.37 m.

In order that the harmonics may be as loud as possible it is advisable to use the same batteries for both receivers, although this is not always necessary.

Since the wavelengths of Rome and the other stations are kept very constant this method is quite an accurate one. I believe it is more accurate than the method of 6CY, owing to the fact that in his determination two frequency readings are necessary, *e.g.* $(185.8—148.9)\div7=5.27$ metres, which introduces greater error.

Trusting that this short description will be of interest.

Yours faithfully,
I. J. P. James (2AMS).

FURTHER CONGRATULATIONS

To the Editor of T. & R. Bulletin.

Dear Sir,—We should like you to accept the congratulations of this company on the coming-of-age of the Radio Society of Great Britain, a society which we feel has had a very material effect in the development of radio in this country, and which has probably cradled many of the leading experts in that field.

In the R.S.G.B. we have the pioneer radio experimenters from which have grown the enormous band of wireless constructors, now numbered by tens of thousands, who have secured interest and entertainment beyond measure, due in no small extent to the activities originally started by the Radio Society of Great Britain.

Yours faithfully,
Ferranti, Ltd.

To the Editor of T. & R. Bulletin.

Dear Sir,—May we congratulate you on the work which your members have carried out during the past 21 years in the development of radio communication ?

Our views on this subject are best condensed by making reference to the extension of the number of available subscribers throughout the world on the telephone systems now linked up by radio through the commercial application of the valuable information which your members obtained in early research on the use of those wavelengths of radio communication which were regarded at one time as useless.

Yours faithfully,
The Westinghouse Brake & Saxby Signal Co., Ltd.

To the Editor of T. & R. Bulletin.

Dear Sir,—It is a great pleasure for the U.S.K.A. to send the Radio Society of Great Britain our hearty congratulations on the occasion of its 21st birthday.

Please accept our sincerest wishes for continued growth and success.

Union Schweiz. Kurzwellen-Amateure.
President, A. Anderegg (HB9S).
Traffic Manager, R. Stuber (HB9T).

To the Editor of T. & R. Bulletin.

Dear Sir,—The Irish Radio Transmitters' Society sends hearty congratulations to the Radio Society of Great Britain on attaining its 21st birthday.

J. Smyth (Commandant),
President.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—The Nederlandsche Vereeniging voor Internationaal Radioamateurisme understands that the Radio Society of Great Britain celebrated its "coming-of-age" on July 5th.

At this important milestone in the life of your Society the N.V.I.R. is very glad to take the opportunity of congratulating the R.S.G.B. on attaining its majority, and of expressing its best wishes for the success of your Society in the future.

Nederlandsche Vereeniging voor
Internationaal Radioamateurisme,
C. M. ZOETMULDER.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—The Radio Society of Latvia (L.R.B.) heartily congratulates the Radio Society of Great Britain on its 21st anniversary.

For and on behalf of L.R.B.,
A. J. KARKLINS (YL2K),
Q.S.L. Manager L.R.B.

TRANSATLANTIC FLIGHT.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—Regarding my North Atlantic Air Route flight, I am sending the following information.

1. The probable wavelength is 34 metres, but a final decision will not be made until after tests.

2. My route will be as follows, alterations being made only in special contingencies :—

Rochester—Londonderry—Vik (S. Coast of Iceland) — *Reykjavik* — Augmagssalik — *Godthab* — Resolution Is. — Payne River — *Povunggnetuk* (Hudson Bay)—*East Maine—Ottawa.*

Places in italics are bases at which stops will be made.

3. A specimen message is given below :—

AA AA AA
GACRK (call sign)
BT

260 miles along track Godthan to Payne River, wind 45 m.p.h., S stop E stio, no cloud, visibility 3 miles, oil temperature 85 degrees rising 16.10 G.M.T.

Repeating . . . . .
AR

Note.—The text consists essentially of four parts : (a) Position, (b) Weather, (c) General, and (d) Time.

The "stop" sign will be indicated in the usual way by three I's.

Yours truly,
JOHN GRIERSON.

Editorial Note.—Over 30 members have expressed their willingness to co-operate with Mr. Grierson during his flight. It is understood that a test flight will take place shortly ; as soon as information is received interested members will be advised.

RECEIVER DESIGN AND R.E.S.

To the Editor of T. & R. BULLETIN.

SIR,—As manager of the receiver design group of R.E.S. I feel it incumbent upon me to reply to Mr. Livesey's letter in the May issue.

It is my belief that the majority of the active memberhip of the Society is chiefly interested in work on the 7 mc. and 14 mc. amateur bands, where terrific interference and long-distance selective fading and distortion respectively frequently render high quality in modulation useless. Furthermore, I know of no amateur transmitter in this country who has the equipment or the delicate and costly measuring devices necessary for efficient high fidelity telephony transmissions.

While I agree with your correspondent in condemning the obsolete "contraption" to which he refers, I do so on the grounds of selectivity rather than L.F. response, for the receiver can undoubtedly give intelligible speech, which is all the average amateur requires of telephony. I would, moreover, remind G6LI that "telephones," having a natural peak resonance around 1,000 cycles, are not the best means of converting his "quality" L.F. output into sound.

Certain types of superheterodynes have been developed whereby the necessary variable selectivity requisite for C.W. and intelligible speech reception under difficult conditions can be obtained, and it is our object to feature articles on this type of receiver in the BULLETIN in the near future.

Yours faithfully,
E. N. ADCOCK (G2DV).

MORE HELPFUL HINTS

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I have followed with interest and appreciation the "Helpful Hints" of an anonymous contributor, and I hope it will not be considered hyper-critical on my part if I draw attention to a serious inaccuracy in No. 6.

The author says, "If a graph is plotted, using any two of the terms as ordinates and the third term is maintained constant (this refers to the equation I=E/R . . . T.P.A.), the slope of the graph is also constant and the curve is a straight line—the simplest form of equation and graph."

Though a moment's consideration will show that this is true when I and E are the variables, and not the case at all when R and I are variables, a beginner may be confused by this statement. And a second error has crept in where the author states : "If the R term is in megohms, it must be put into the expression as 'R' divided by 1,000,000." Perhaps it would be clearer and what the author meant, I presume, if one were to read this, "If the known resistance is in megohms it must be *multiplied* by 1,000,000 before insertion in the formula."

Without going into the matter of graphs at all, it might assist the beginner if he were to realise that the "volts required per ampere" is really the measure of the opposition of a circuit, whether D.C. or A.C. And the ohm is just the opposition represented by unit value of the above expression.

Later, when the reader wishes to handle complex parallel A.C. circuits, he will have little difficulty in inverting this measure and thinking of "amperes per volt" as a measure of the ease with which a current may be set up in a circuit or "admittance."

Yours faithfully,
T. P. ALLEN (GI6YW).

BRS1250, R. E. Higlett, has changed his address to "Radio House," 6a, Northam Road, Southampton.

RESEARCH AND EXPERIMENTAL SECTION

MANAGER:

H. C. Page (G6PA), Plumford Farm, Ospringe, near Faversham, Kent.

GROUP MANAGERS:

No. 1: 1.7 and 3.5 MC. WORK
J. H. Hum (G5UM), 68, Bridge Road East, Welwyn Garden City, Herts.

No. 2: 56 MC. WORK
E. A. Dedman (G2NH), 63a, Kingston Road, New Malden, Surrey.

No. 3: ARTIFICIAL AERIALS
J. K. Todd (G2KV), 12, St. John's Road, Cambridge; and Orchard Place, Wannock, Polegate, Sussex.

No. 4: ATMOSPHERE AND FADING
J. C. Elmer (G2GD), Aethelmar, Seabrook Road, Hythe, Kent.

No. 5: TELEVISION
C. W. Sands (G5JZ), Springfield, Heathfield, Sussex.

No. 6: CONTEMPORARY LITERATURE
R. A. Fereday (PAOFY), Reinkenstr, 40, The Hague, Holland

No. 7: RECEIVER DESIGN
E. N. Adcock (G2DV), 206, Atlantic Road, Kingstanding, Birmingham.

No. 8: TRANSMITTER DESIGN
A. E. Livesey (G6LI), Stourton Hall, Horncastle, Lincs.

No. 9: AERIAL DESIGN
F. Charman (G6CJ), The Cottage, Park Way, Hillingdon, Middlesex.

No. 10: VALVE RESEARCH
D. N. Corfield (G5CD), 10, Holders Hill Gardens, Hendon, N.W.4

No. 11: 28 MC. WORK
(Manager to be appointed.)

No. 12: AUXILIARY EQUIPMENT
A. O. Milne (G2MI), "Southcot," Larkfield, Kent.

THERE are few points of outstanding interest to comment upon this month. The groups are steadily being formed, and regular work is under way, but it will be several months yet before work is in full progress.

Next month I hope to be able to publish the arrangements which are being made in regard to 28 mc. work. The question of Group Managership is under consideration.

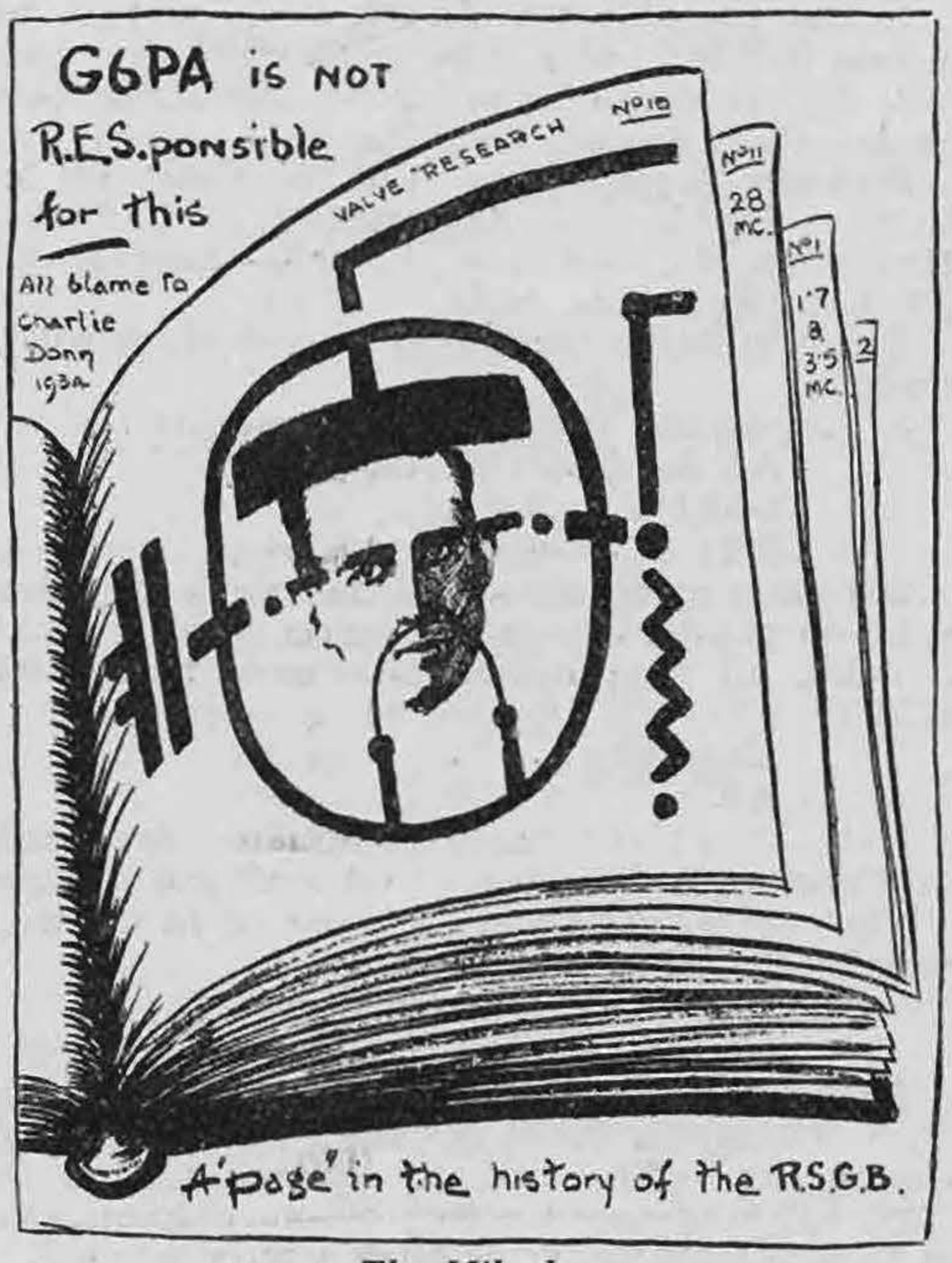
It is with pleasure I have to announce the formation of a group to be known as the "Auxiliary Equipment Group." This will be under the management of G2MI, and will devote itself to the development of apparatus directly concerned with radio, such as coil winders, automatic senders, and the host of things which can be of great help to all of us in the operation, and construction of our stations. Appointment to this group will be at the discretion of G2MI and myself, and will be limited to such people as are the lucky possessors of a workshop, and who are also good workmen. The main idea of the group is to assist anyone with a "brain wave" to carry it into practical operation. There must be a number of people with "bright ideas" who are unable to carry them out because they do not quite know how to go about the job, conversely many have facilities for such work who would be willing to carry the idea into practice.

I would like to make it quite clear that only men with good technical ability need apply for inclusion in this group. Monthly reports will not be expected, as new ideas and designs cannot be produced to order.

Now a word to the members of the old Receiver Design Group, which was conducted by BRS981. BRS981 is now in China, and has asked me to convey his good wishes to all of you, and his thanks for your past co-operation. He will be very pleased to hear from anyone interested in Receiver Design. His address is: Telegraphist Scudder, H.M.S. "Mantis," c/o R.N.O., Shanghai, China. All letters should be marked "Via Siberia," as they take considerably less time to reach their destination by that route.

1.75 and 3.5. mc. Group (No. 1).

G5FI describes 1.75 mc. reception on a midget 2-valve frame aerial receiver during his vacation, when he co-operated with other members of the Group. G5UM reports conditions on both bands as very good; he has been testing a quarter-wave Zepp against a full-wave Hertz on 170 metres, and reports the Zepp to be decidedly superior. He gives a diagram (Fig. 1) showing reports obtained with the Zepp on May 20-21.



The Mikado.

1C.—Remarkably interesting experiments in frequency dividing are described by the G.C., ex-2AQW, now G5WW. A 1.75 mc. tank coil is used with a 7 mc. crystal in the grid circuit of an MPT4 pentode, and enough R.F. output is obtained to drive a 1.75 mc. P.A. to a full 10 watts. A considerable amount of work has been done with pentodes, using a MPT4 or MP-Pen with Va200 and Vag120, the R.F. output is considerably

greater than with an LS5b using 500 Va. Using a pentode in the P.A. dissipating about 15 watts, the H.F. output is about *twice* that of an LS6A running at 20 watts. Unfortunately with this arrangement of two pentodes, grid current in the P.A. is very high and if the key is kept down for more than a few seconds the grid becomes white hot! The great advantage of using a pentode as C.O. is that the auxiliary grid may be keyed, and this gives a clickless transmission quite free from the usual lag experienced when keying a C.O.

G6OO mentions a blanket effect from 22.30 B.S.T. until daybreak. When south country stations

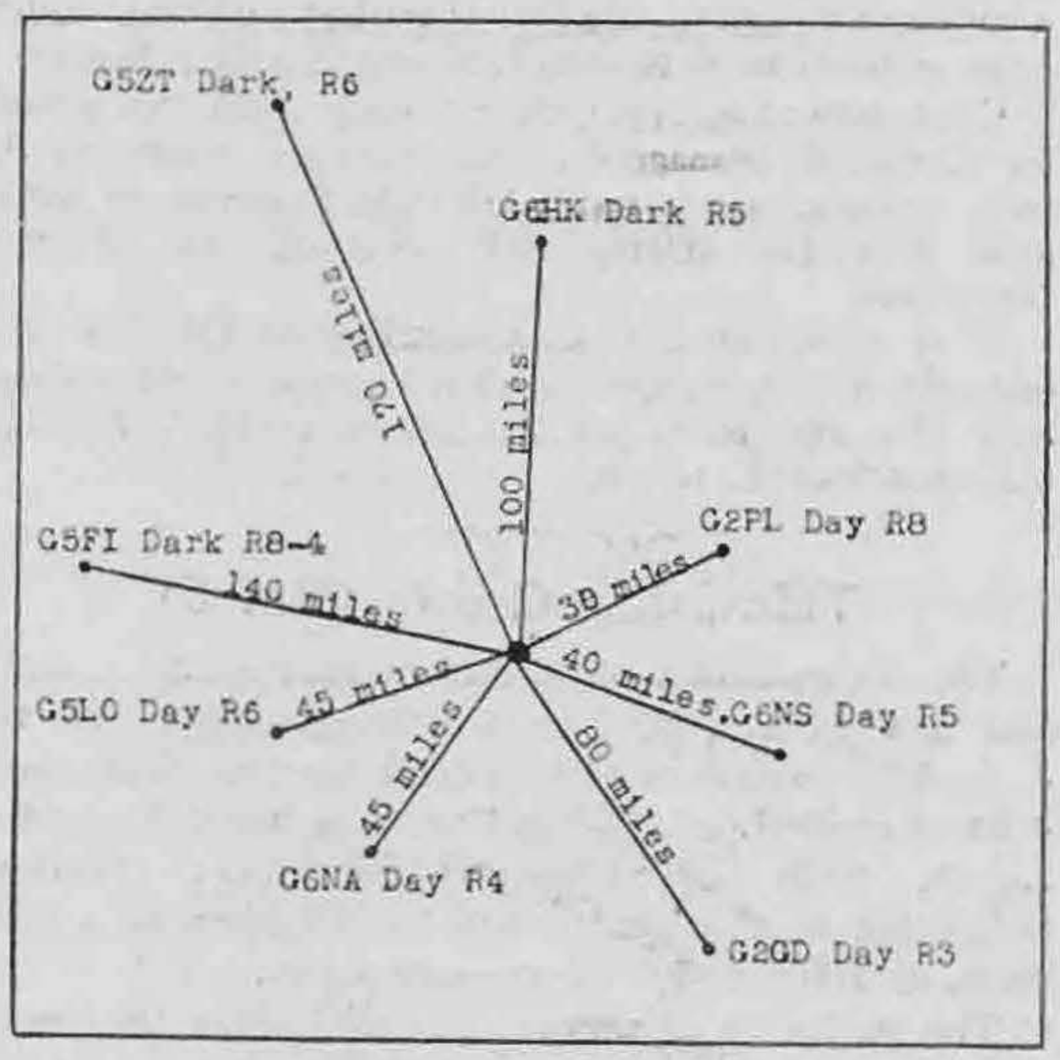


Fig. 1.

Signal strength reports obtained by G5UM, May 20-21, using Zeppelin type aerial.

are contacting Scottish or local stations, he cannot work more than 30 miles; he thinks the Yorkshire Wolds are responsible for this effect.

1*E*.—Only one member fails to report in the Reception Group. Spadework is being done at the moment, but it is hoped to get down to a definite line of research soon. BRS1186 is now 2BKN; he is trying to associate barometric conditions with DX, but as yet with few positive results. 2BVH is making hum-neutralising experiments with his battery receiver, considerable noise being picked up when an earth connection (essential on the low-frequency bands) is used.

56 MC. Group (No. 2).

N.F.D. work has hindered 56 mc. outings considerably, according to a number of reports received. It has been decided to deviate from the usual method of reporting this month, and instead of giving very brief reports of each member's individual work, one member's letter is given in full. I think it will be agreed that the details of 2AVN's aerial system are very interesting and instructive. If this method of reporting meets with approval, it is hoped to give the most interesting letter or letters from all the budgets, in full each month, as this should be of the greatest vlaue to the members of the Society in general.

We are organising a 56 mc. field day on Convention Sunday, August 26, as announced in the last issue of the BULLETIN. Full details have not been completed, but will be given in the next issue of the BULLETIN. In view of the fact that a number of members will be in London for Convention, it is considered inadvisable to make it a competitive affair, the real idea being to give members who are still strange to 56 mc. work an idea of the type of apparatus used for portable work. If you are able to run your station in the field please let G2NH have details as soon as possible, in order that a list of QRA's may be anounced at Convention for the benefit of visiting members.

Please note that it is essential for the letter budgets to reach the Groups Manager before the 18th of the month, in order that they may be reported on in the next issue of the BULLETIN. This month's report has been delayed until the last possible moment, but no budgets have been received from Groups 2*A*, 2*C*, or 2*F*.

The Picard Aerial for 56 mc. Work

(*Contribution to Group 2D Letter Budget by 2AVN.*)

The Pickard aerial at this station is a half-wave aerial fed at the centre by means of 3 slab coils of a few turns each, placed side by side and connected together to form an auto-transformer. The feeders are connected to the outer ends *x* (Fig. 2), while the taps to the aerial are taken off at points *y*, these being the junction points between coils. This method of matched impedance feeding has been thoroughly tested by the writer, and results definitely prove that it is superior to any other form of aerial coupling. The great advantage is that any convenient length of feeder can be used. Feeders from 4 to 45 feet long have been tried with exactly the same results.

The actual aerials used are telescopic legs from a camera tripod, with the impedance matching coils mounted in the centre. It has been found that the rods have to be pushed in to the first joint,

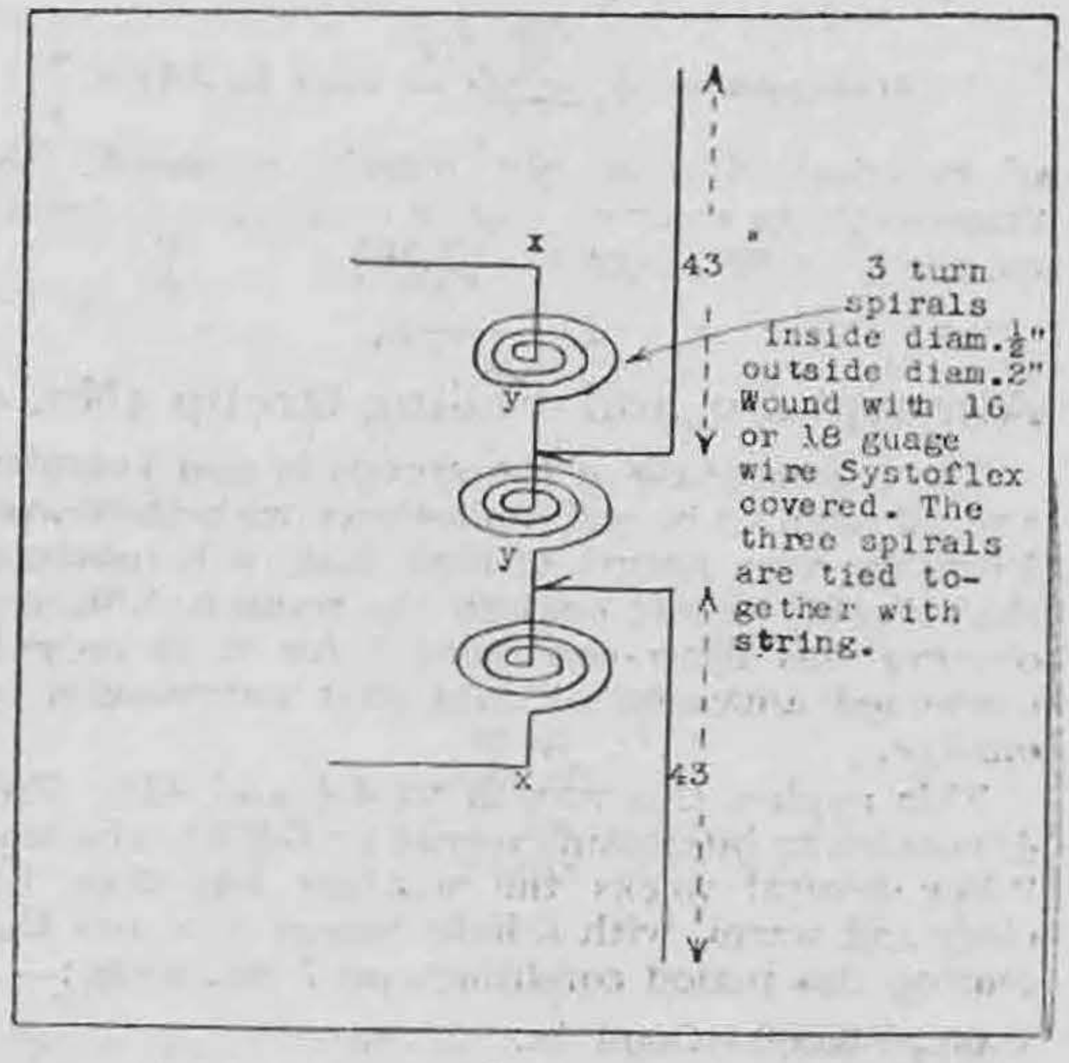


Fig. 2.

The Pickard aerial used by 2AVN.

making each one 43 inches long instead of 49 inches, due to the loading of the coupling coils at the centre. The aerial arrangement has also been tried using ordinary twisted lighting flex as feeders, and although this method is not so efficient as using the more normal spaced feeder system, it is felt that it will often be of assistance in enabling the aerial proper to be placed in the best radiating position.

A varied collection of results has been accumulated, but one thing is agreed by all co-operating, and that is that superior results are always obtained by arranging the aerials as shown in Fig 3.

It will be noticed that one-half of the aerial (i.e. one ¼-wave rod) is vertical. The other can be placed in any position from that of " 9 o'clock " to that of " 3 o'clock," passing through " 6 o'clock."

2AVN offers no explanation for the latter phenomenon, but I would suggest that it is due to the fact that the polarisation of the signal is changed, and this happens to suit the aerial arrangement at the receiving end, or vice versa, when the Pickard aerial is used for reception purposes. This seems to offer a field for experiment, as there appears to be little doubt among 56 mc. workers that the angle

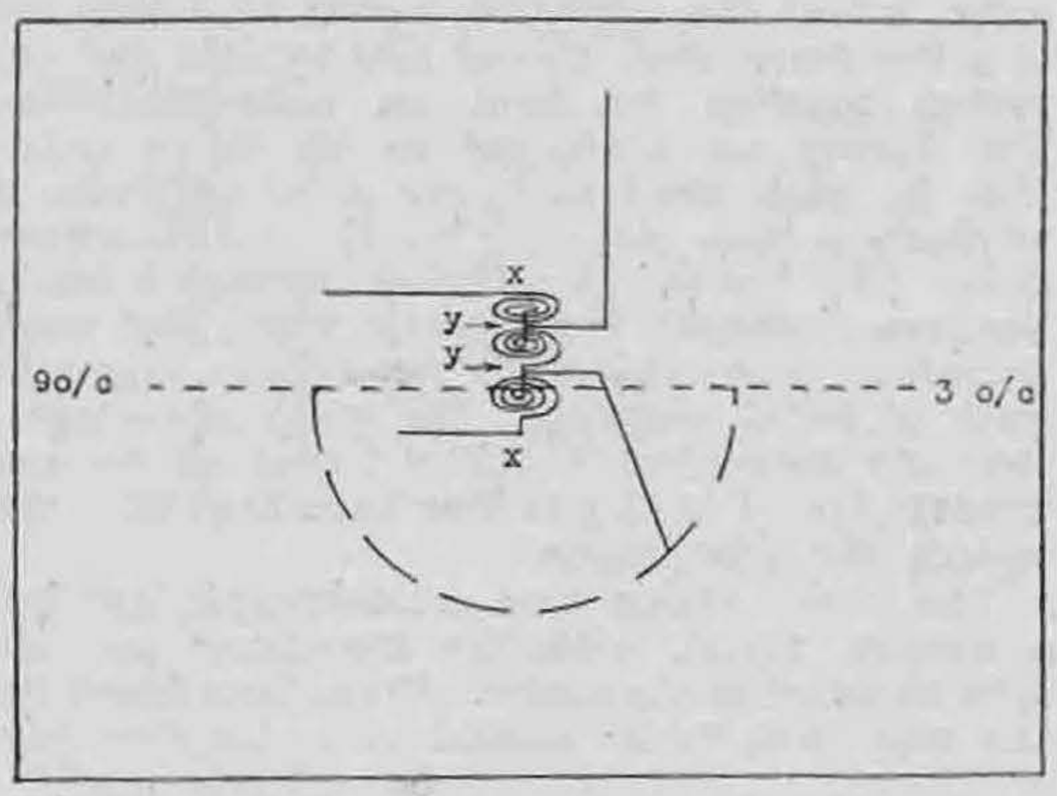


Fig. 3.
Arrangement of aerials as used by 2AVN.

of polarisation does not remain constant from transmitter to receiver, and in some cases is twisted as much as 90 degrees.—(G.M.)

Atmosphere and Fading Group (No. 4)

The organisation of the groups is now complete, and all seem to be well under way with their work. From the very nature of their task, it is inevitable that reports should contain the remark, " Routine observations have continued," for it is only by continued amassing of data that any results can emerge.

This applies this month to 4*A* and 4*D*. From 4*D* comes an interesting report by G5OQ, who says: " For several weeks the weather has been fine, clear and warm, with a light breeze now and then. During this period conditions on 7 mc. were :—

06.30-08.00—Good dx.

08.00-12.00—Band becoming very quiet and very quiet indeed at 13.00.

16.30-17.00—Atmospherics begin.

17.30-23.00—Very loud local signals, especially G.

Now these conditions continued with unfailing regularity until June 3, when the weather suddenly changed to cloudy, with a cold wind (early spring conditions). Conditions on the 4 bands were very similar to those prevailing in March."

Generally the report confirms the Isobar theory. Reports come also from G6QH, G6HA, 2BDA. The G.C. G5AM contributes an article on " Group " and " Phase " velocity of waves. It is suggested by Van der Pol that the " long-delay " echoes may be due to the signal travelling in the ionosphere at a reduced velocity, the signal perhaps having undergone successive ricochets between E and F layers.

Contemporary Literature Group sends an article by Leonard Frohn on observations made on 3.5 mcs. transmissions from OE1CM (Vienna 45 kms.) and HAF4A (Budapest) received at Wiener-Neustadt.

It is concluded that reception of OE1CM was entirely dependent on a high humidity percentage, and the reception of the more distant HAF4A was unaffected.

Television Group (No. 5)

The Television Group has at last made a start, but not with a very encouraging effort. Of the 8 Society members approached by the G.M., only 4 have replied. A Group Centre is being formed in Leeds, with BRS1098 as Manager; members belonging to this centre will be informed at a later date, as BRS1098 is at present away.

The majority of reports to hand show that most members are just starting building the apparatus to receive Vision. G5ZT is busily engaged building a disc televisor and hopes to get going as soon as possible. 2BYP contemplates building a receiver and special amplifier for reception of vision, but owing to his QRA being in Glasgow, he experiences severe fading on London National .

2BAW is receiving very good pictures from the B.B.C. when fading and interference permits; he is using a disc receiver, with an ordinary " beehive " neon in conjunction with a 16 in. disc; the motor is a 6 volt type, with a spring drive to disc with a reduction of 2 to 1; manual synchronization is employed. The neon is choke-coupled to the amplifier with an alternative for a reversed image. The amplifier is a home-made 3-valve job, with AC/2HL R.C.C. to a PX25, with about 450 volts on the plate of the last valve. For B.B.C. work an H.F. pentode is used before the detector, and for short-wave work a simple S.G. valve, detector battery feed to keep noise-level down. The results, given a good reception compare favourably with the pictures in the evening papers. 2BAW would like to know who operates the station which transmits television on about 7,200 kc. Can anyone help ?

BRS1098 is busily engaged building the necessary gear, and hopes to " look-in " soon; he also puts forward a very good suggestion. He has copies of " Television " from No. 1 in batches of 12, and is willing to lend these out to members of Group 5; there are 7 batches and these will be sent around

to members in the same way as a letter budget, allowing one month in which to read and make any notes ; all he asks is that he is informed as to where they are sent, and that the sender pays postage. The G.M. advises all members desirous of taking advantage of this offer to drop him a line at once.

G2AO is using a " Baird " mirror drum receiver with very fine results. G2AO is believed to be the only amateur transmitting television. Disc scanning on the 30-line type is used with a 500 watt projection lamp in conjunction. The photo-cell is an Osram C.M.G., and is arranged in front of a reflector in a similar manner to that of the Marconi Company ; this is coupled to the photo-cell amplifier, which is a S.G. 2-volt type, and this is, in turn coupled to a 5-stage line amplifier, all R.C.C.

Tests with G5JZ have been in operation since January, 1933, and results are now comparable with the B.B.C. transmissions. A 5-metre sound channel between the two stations is now under test, with good results.

G5JZ employs a disc receiver, using a standard " Baird " disc driven by a 6-volt motor, manual sychronization is used, the neon is a " MSV201," one of the " whiteish " glow type, the amplifier is a 3-stage type, with an LS5A output valve. Excellent results have been received from G2AO, London, Zeesen and Post Parisienne.

G5JZ has also been testing a television transmitter with good results, and it is hoped the results will soon be good enough to feed into the transmitter, so that a two-way vision contact may be made with G2AO.

Receiver Design Group (No. 7).

The group is now organised into three sub-groups, the immediate work on hand being as follows :—

7*A*.—A.C. mains super-hets.—BRS983 reports construction of a " straight " super for preliminary experiments. BRS830 has built a 1-v-1 as his initial attempt at all main S/W receivers, with encouraging results. BRS1427 is experimenting with A.F. pentodes as frequency changers ; he reports successful use of regeneration in the I.F. amplifier as a means of obtaining increased selectivity. 6VZ is to build a super as soon as suitable I.F. transformers are available. ON4AU suggests that selectivity of a modern RX should be such that break-in work is possible up to 5 kc. from the transmitted frequency. 2UH (G.C.) is working on a single signal model using regeneration at intermediate frequency and " Westector " A.V.C. (experiments to date point to insufficient output being available from the " Westector " for this work, and utilising any present known system, A.V.C. is of doubtful value below the 3.5 mc. band —G.M.)

7*B*.—Battery-type super-hets. BRS1344, 2NK, BRS1300, and 5TL (GC) are working on the above, special attention being paid to low H.T. consumption—a matter of considerable difficulty with an efficient super. To this end selectivity is being obtained by means of I.F. regeneration. BRS1300 is successfully using the VHT2 pentagrid as frequency changer, and 2NK is doing the job in laboratory style, using a Moullin voltmeter for stage-gain measurement. 6WJ has also joined the group.

7*C*.—It being realised that simple " straight " receivers will always have their adherence, this group is concentrating on this work, portables also receiving consideration. As the group has only just been formed, no individual reports are yet to hand.

Will all concerned please note the G.M.'s new QRA—206, Atlantic Road, Kinstanding, Birmingham.

Aerial Design Group (No. 9)

This section is still not completely organised, but the G.M. has heard from *nearly* all those circularised a month ago. It is rather difficult to cater for the needs of all members, but sub-group formation is now well under way.

There are one or two reports ; G2UH (ex-YIHT) is working on a 28 mc. beam for Egypt, about which we shall probably hear more later. G6PJ sends details of his 7 mc. aerial, which consists of a 70 ft. V folded back at about 30° and tapped on to the plate coil. It appears to get out fairly well, but it must tune somewhat more sharply than an open half-wave.

Some experiments on a beam for 14 mc. have been made at G6CJ, but are not yet complete enough for publication. It consists of two vertical dipoles, starting from ground-level, with two reflectors, and has a theoretical directivity of about 5, over a single dipole. Judging by reports, it is nearly as good as the dipole 60 ft. high which is normally used.

Belgian Notes.

By ON4AU.

ON4BZ has obtained his telephony W.A.C. by working J2HI (a YL operator in Nippon). He uses a COPA with a 503a in the final stage modulated nearly 100 per cent. by a Class B amplifier with four .46 valves. ON4AU has been in QSO with K6COG, who reported his 'phone R7 ; this is believed to be the first 'phone contact between Europe and Hawaii. He uses a Class A Heising circuit with an input of 300 watts. This station is now working simultaneously on 14 and 28 mc. using an input of 250 watts, and reports will be welcomed. Tourmaline control is being investigated by ON4JB and 4EL.

The stratosphere tests will be made with an input of 15 watts c.c. on one of four frequencies in the 7 mc. band. ON4AU will accompany the balloon in a Gipsy Puss Moth with the call GAAFA, and will use a portable giving 12 watts modulated and 25 watts c.w. input. The balloon will ascend from Dinant. The official Reseau Belge station is operated every Sunday at 09.30 G.M.T. on 3535 kc. with an input of 100 watts, and full details of the ascent will be announced from this station during July.

ON4AU hopes to W.B.E. and W.A.C. whilst in the air ! Tests which have already been made show that an R3 DX signal at ground level becomes R8 at 12,000 ft.

ON4NC and 4GN are working on 28 mc. and solicit reports. ON4SD has been QSO FM8CR on this band.

HIC ET UBIQUE.

Ninth Annual Convention, 1934—Telephony Contest—Radio Exhibition, 1934—QSL Section—W.B.E. Certificates.

Ninth Annual Convention, 1934

The following provisional programme has been arranged :—

FRIDAY, AUGUST 24.

6.0 p.m.—Conversazione and Running Buffet at Maison Lyons, Shaftesbury Avenue, W.C.2. Cost per head 1s., payable on arrival.
8.0 p.m.—National Field Day Film.

SATURDAY, AUGUST 25.

9.30 a.m.—Delegates Meeting at I.E.E., Savoy Place, W.C.2.
11.0 a.m.—General Business Meeting.
12.45 p.m.—Lunch at Slater's Restaurant, Strand (approximate cost 2s. 6d. per head).
1.50 p.m.—Photograph outside I.E.E.
2.0 p.m.—Presidential Greetings.
2.10 p.m.—Presentation of Trophies.
2.20 p.m.—Technical Talks by members.
4.0 p.m.—Tea.
6.30 p.m.—Convention Dinner at Florence Restaurant, Rupert Street, W.C.2. Tickets 5s. each.

SUNDAY, AUGUST 26.

National 56 mc. Field Day, arranged by R.E.S. 56 mc. Group. Provincial members wishing to visit London stations are requested to communicate with the London D.R.'s.

From past experience we are of the opinion that the majority of members favour an opportunity of exchanging views with their colleagues on these occasions, consequently the major portion of the Friday evening meeting has been left free for this purpose.

The decision to hold a general business meeting on the Saturday morning has been made with the knowledge that many provincial members consider that our time during the last few Saturday afternoon Convention meetings has been wasted in immaterial discussions. To overcome this criticism technical talks, which were a feature of the Conversazione last year, are to be given in the afternoon. We hope to publish a list of speakers in our next issue.

It is not our intention to organise a lucky draw on this occasion.

It is *absolutely essential* that Headquarters should have early particulars of those attending the social functions, therefore members are urged to notify the Secretary without delay if they intend being present.

As this Convention will mark in a public manner the Society's Coming of Age it is hoped that all members will do their level best to put in an appearance.

Members who wish to bring forward points for discussion at the business meetings are asked to communicate them to their D.R. prior to July 28.

Radio Exhibition Stand.

The Society will, as usual, be represented at the forthcoming R.M.A. Exhibition to be held at Olympia. The stand has been provisionally numbered 204, and will be located in the Gallery near the entrance to the Minor Hall.

It is hoped to display several interesting items, including the new 10 watts c.w. and telephony transmitter described in our last issue by Mr. A. E. Livesey, G6LI. Members possessing well-made 56 mc. receivers or transmitters are invited to submit same for display, such apparatus must reach Headquarters prior to August 15.

In order to effectively man the stand throughout the exhibition period volunteers are wanted from the London area. These members must possess licences and be capable of answering general technical queries. Offers for day-time duty are particularly required. Duty periods will be as follows:—10.45 a.m. to 1.15 p.m., 1.15 p.m. to 4 p.m., 4 p.m. to 6.30 p.m., 6.30 p.m. to 10 p.m.

Two responsible members are also required to take complete charge of the stand from 6 p.m. to 10 p.m. on Friday, August 24, and Saturday, August 25.

Telephony Contest.

We have pleasure in announcing that one of our Provincial members, who wishes to remain anonymous, has offered the sum of £10 for a Telephony Contest aimed at encouraging low-power work on 14 mc.

The rules governing this contest are as set out below :

1. The contest is open to all fully paid-up and licenced members of the Society resident in the British Isles.
2. The 14 mc. amateur band only will be used.
3. The contest will extend for a period of six months commencing October 1, 1934, and concluding March 31, 1935.
4. Telephony contacts only will be permitted to count for the awards, and the signal strength reported must not be less than QSA4R4. Initial contacts by means of C.W. will be permitted.
5. The input to any one stage (whether oscillator or amplifier) shall not exceed 10 watts. Not more than three stages, exclusive of the modulator, may be used.
6. Crystal control or some other recognised method of frequency stabilisation shall be used.
7. Reports from stations worked must be in writing.
8. The average distance measured by a Great Circle Line of the seven most distant stations worked during the period will be taken as the score for each entrant.
9. In the event of two competitors tieing, Council will request details of the next seven best contacts, and will base their award on the average for the 14 contacts.
10. Apparatus to the value of £7 will be awarded to the entrant obtaining the highest score. Appar-

atus to the value of £3 will be awarded to the entrant obtaining the second highest score.

11. It is a condition of entry that a detailed station description with at least one photograph shall be submitted by each entrant. Descriptions of the winning stations will be published in the T. & R. BULLETIN.

12. Each entrant will be required to sign a declaration to the effect that his station has been operated in accordance with these rules.

13. Council's decision in all cases of dispute will be final.

14. Entries must reach the Secretary, R.S.G.B., 53, Victoria Street, London, S.W.1, not later than May 31, 1935

Radio Exhibition, 1934.

Council have agreed to supply one free ticket of admission to the Olympia Radio Exhibition to any member sending a stamped and addressed envelope to Headquarters.

No other correspondence may be included with the application, and the envelope must be marked "X" in the top left-hand corner. Failure to observe this instruction will cause delay.

No application will be considered if received later than August 15.

Some First Contact Claims.

Mr. J. MacIntosh, VS2AF, of Kuala Lumpur, reports that he has recently worked HC2JM (Ecuador), thus giving him W.A.C. in four months with an input of 15 watts from an E.C.O. He believes this is the first contact between VS1, 2, 3, and HC.

Mr. MacIntosh has also established what he believes to be first contacts between VS 1, 2 and 3, and Guam (OM2AA, May 4), Egypt (SU1SG, May 24), Hawaii (K6COG, April 20), South Africa (ZU1E, February 27), Danzig (YM3T, February 8), and Reunion Island (FB8VX, March 4). The last three contacts were made with an input of 5 watts.

G2ZQ was his first British qso.

More 56 mc. Tests.

Mr. G. F. Bloomfield (G5MG), 34, Morton Way, London, N.14, will transmit a series of 56 mc. tests on Sunday mornings between 10.00 and 10.15 B.S.T., and on Monday evenings between 22.55 and 23.00 B.S.T. during the months of July and September. I.C.W. and telephony will be used, with an input of 10 to 12 watts. Co-operation with other stations, in order to test directional properties of the aerial in use, is solicited. The station is located on high ground in North London, and it is anticipated that signals will be well received in a South and South-West direction.

QSL Section

Manager: J. D. CHISHOLM (G2CX).

Permission has been granted by Council for the printing of the rules of the section in broad sheet form, and these will be available shortly. It was decided to hold up publication until these notes had appeared, so that a convenient reprint could be used for the purpose. To those who have had to wait in consequence we offer apologies.

Slow Morse Practice.

Details of slow Morse practice times for July-August are given below. Test matter will be taken from recent issues of the T. & R. BULLETIN, and the page number and month of issue will be given at the end of each test. Reports will be appreciated, and are desired, in order to ascertain range of transmissions. If reply is required, please enclose stamped addressed envelope or card. Additional stations willing to assist on either 1.7 or 3.5 mc. (or both) bands should get in touch with Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4. There will be no tests on August 26—Convention Sunday.

SCHEDULE OF SLOW MORSE TRANSMISSIONS.

Date, 1934.		B.S.T.	Frequency kc.'s	Station.
July 22	Sun.	00.30	1,820	G2OI
,, 22	Sun.	10.00	1,815	G2DQ
,, 22	Sun.	11.00	1.7 mc.	G2UV
,, 29	Sun.	00.30	1,820	G2OI
,, 29	Sun.	10.00	3,630	G2DQ
,, 29	Sun.	11.00	1.7 mc.	G2UV
Aug. 5	Sun.	00.30	1,820	G2OI
,, 5	Sun.	10.00	1,815	G2DQ
,, 5	Sun.	11.00	1.7 mc.	G2UV
,, 12	Sun.	00.30	1,820	G2OI
,, 12	Sun.	10.00	3,630	G2DQ
,, 12	Sun.	11.00	1.7 mc.	G2UV

W.B.E. Certificates.

The following W.B.E. Certificates have been awarded :—

Name	Call Sign	Date 1934
W. M. Moore	VK2HZ	May 1
S. Newell	G5RX	,, 2
H. W. Sadler	G2XS	,, 2
J. M. S. Watson ...	G6CT	,, 7
E. Taylor	G5VQ	,, 9
I. E. Hill	SU6HL / ST2D	,, 10
G. W. Reid	VK2FZ	,, 16
W. T. Wishart ...	VK4WT	,, 16
J. B. Wormall	G6KQ	,, 17
J. H. Wetherill... ...	G2TK	,, 18
C. W. Crook	G5BT	,, 24
T. H. Beaumont ...	VU2FP	,, 30
L. C. Hunter	ZL3BJ	,, 31
F. J. Wadman	G2GK	,, 31
W. James	G6XM	June 1
A. E. Brookes	G6VK	,, 1
F. H. Pettitt	SU1SG	,, 1
W. M. Moore	VK2HZ	,, 11
E. Gaukrodger	G6GU	,, 11
R. Carlisle	G16WG	,, 11
F. Robinson	G5XT	,, 20
F. M. Gillett	W6HX	,, 20
S. Howell	G5FN	,, 26
F. Gilfillan	VQ4CRO	,, 29

Congratulations

News has just reached us that Mrs. Arthur Milne, wife of our very popular No. 16 District Representative has presented him with a junior operator. We hope that the wee lad may grow up to become as good a "ham" as his O.M.

QRA Section.

Manager: M. W. PILPEL (G6PP).

U2QG, via G5SR, reports the following changes in the Russian districts:—

U1 is now U7, U8 and U9
U2 ,, ,, U3
U3 ,, ,, U1
U4 ,, ,, unchanged
U5 ,, ,, ,,
U6 ,, ,, ,,
U7 ,, ,, U6
U8 ,, ,, U7
U9 ,, ,, U2

NEW QRA's.

G2CM.—W. MOFFAT, 33, Charter Street, Gillingham, Kent.
G2HM.—N. BLACKBURN, 94, Moss Lane, Bolton, Lancashire.
G2IF.—J. SETTERFIELD, 34, Cavendish Road, Blundellsands, Lancashire.
G2JM.—H. MUSGRAVE, Baymead, North Petherton, Somerset.
G2JN.—J. STONESTREET, Pilot's Lodge, Lower Hardres, Canterbury, Kent.
G2MD.—C. F. GARNER, 32, High Street, Kempston, Bedford.
G2NQ.—A. L. THORLEY, 15, Parkdale Avenue, Wednesbury, Staffordshire.
G2OT.—J. A. SMITH, 33, Park Terrace, North Shields, Northumberland.
GI2OY.—D. MEHAREY, "Meadowbank," Whitehouse, Co. Antrim, N. Ireland.
G2QM.—M. J. HEAVYSIDE, 325, New Hey Road, Bradford, Yorkshire.
G2QT.—F. H. COOPER, "Fairbank," Smeath, Ashford, Kent.
G2TH.—T. HALL, "Oak View," Colney Heath Lane, St. Albans, Hertfordshire.
G2TM.—T. W. M. MILLAR, 103, Dalkeith Road, Edinburgh, Scotland.
G2TR.—J. SCHOLEFIELD, 2, Balmoral Road, St. Anne's-on-Sea, Lancashire.
G2UY.—A. R. LAND, 10, Kimberley Road, Bradford, Yorkshire.
G2VT.—W. K. HILL, "Tanglewood," Upper Shirley Road, Croydon, Surrey.
G2XV.—G. A. JEAPES, "Akron," Perne Road, Cambridge.
G2YP.—D. B. PIPER, 65, Glendale Avenue, Edgware, Middlesex.
G2ZJ.—W. A. NOKES, 72, Lewisham High Road, London, S.E.14.
G2ZX.—A. N. PORTER, 29, Fernbank Road, Redland, Bristol.
G5IG.—G. O. KOLLIEN, 15, Groathill Avenue, Craigleith, Edinburgh.
G5MM.—R. MAIDMENT, "Red House," Hoo, Rochester, Kent.
G5PB.—N. L. H. PLATT, "Daneswood," Barton Court Avenue, New Milton, Hampshire.
G5RD.—A. GARDNER, Ashleigh, Abbots Langley, Watford, Hertfordshire.
G5UD.—P. GRIFFIN, 7, Davis Buildings, West Street, Bedminster, Bristol.
G5WS.—F. WARRINGTON-STRONG, 7, Melville Road, London, S.W.13.
G5WW.—P. M. CARMENT, 58, Gurney Drive, London, N.2.
G5XJ.—J. MOORHOUSE, 3, Highlands, Royton, Oldham, Lancashire.
G5XV.—R. Y. PARRY, 127, Charlton Road, Kingswood, Bristol.
G6AH.—A. A. HAMMOND, 3, Bradford Road, Seven Kings, Essex.
G6BV.—BOURNEVILLE RADIO SOCIETY (J. W. F. Walker, 11, The Link, Acocks Green, Birmingham).
G6CT.—J. WATSON, 23, Eastwood Boulevard, Westcliff, Essex.
G6HB.—T. H. BEAUMONT, Rushey Ford, Kempston, Bedford.
G6IN.—J. B. INGLIS, Northfield, Hawick, Roxburghshire.
G6JF.—L. SIDWELL, 114, Regent Street, Nelson, Lancashire.
G6OF.—M. SHAW, 57, Balfour Road, Ilford, Essex.
G6RN.—G. O. RAVENSCROFT, 2, Edward Street, Cleethorpes, Lincolnshire.
G6WJ.—V. PARKER, 83, Mount Crescent, Thornes Road, Wakefield, Yorkshire.
2ACC.—C. S. LAVENDER, 43, Malling Road, Snodland, Kent.
2AGF.—F. G. SPRAGG, 432, Leagrave Road, Luton, Bedfordshire.
2AHK.—M. SMITH, Eden House, Edengrove, Felton, Bristol.
2AJG.—R. L. MARKHAM, 11, Kingsway, Tynemouth, Northumberland.
2ANS.—C. SUFFOLK, 258, Roman Road, London, E.3.
2ANT.—D. A. EDWARDS, "Selwyn House," Chester Road, Sutton Coldfield, near Birmingham.
2ASG.—A. ROBINSON, Wellington Street, Morley, Leeds, Yorkshire.
2AWH.—W. STIRLING, Mossgrove, Bridge of Allan, Scotland.
2AXM.—C. M. WINTON, 56, Balfour Crescent, Lambert, Stirlingshire.
2AZN.—R. L. CASTLE, 111, Drakefield Road, London, S.W.17.
2AZU.—F. ELLINGER, 53, Nuns Road, Winchester.
2BHP.—E. G. ARTHURS, 13, Walton Well Road, Oxford.
2BHZ.—C. GREGG, 46, Highbury Road, Bulwell, Nottingham.
2BKN.—L. F. VINEY, 5, Twyford Avenue, Fortis Green, London, N.2.
2BLM.—J. W. WISE, 105, Woolstone Road, London, S.E.23.
2BTH.—T. F. HALL, 42, Creek Street, London, S.W.11.

The following are cancelled: G6KQ, G6KY, GI6MK, 2AQB, 2AQW, 2ASF, 2AUA, 2BAB, 2BCM, 2BGR, 2BGT.

NEW MEMBERS.

HOME CORPORATES.

DR. C. G. LEMON (G2GL), 19, Lena Gardens, Hammersmith, W.6.
L. W. HERMES (G2LH), 444, Ewell Road, Surbiton, Surrey.
F. L. BUTLER (G2QF), 38, Peartree Avenue, Thurnscoe, nr. Rotherham, Yorks.
F. L. POSTLETHWAITE (G5KA), 41, Kinfauns Road, Goodmayes, Ilford.
H. R. TAGGART (G5TA), 43, Schoolhill, Aberdeen.
L. G. SPENCER (2AOI), 24, Rectory Terrace, Gosforth, Newcastle-on-Tyne.
G. E. COATES (2ATD), 5, Le Breos Avenue, Swansea, Glam.
C. J. MCCLELLAND (2BJD), Myrtle Cottage, Claverdon, nr. Warwick.
A. C. WILLIAMS (2BYB), 16, James Street, Port Talbot, Glam.
R. N. SMITH (BRS1459), Kenmure Lodge, Belmont Road, Exeter.
R. I. TIBBENHAM (BRS1460), 15, Clifton Hill, Exeter.
J. C. MCINTYRE (BRS1461), 162, Watt Street, Glasgow, C.5.
H. JACKSON (BRS1462), 88, Wyley Road, Coventry.
W. C. LUPTON (BRS1463), 16, The Cross, Lymm, Warrington.
V. GRADWELL (BRS1464), 156, Ainsworth Road, Radcliffe, Lancs.
A. R. NICHOLSON (BRS1465), 7, Stanhope Road, Darlington, Yorks.
A. D. LAMB (BRS1466), 29, George Street, Stranraer, Scotland.
J. AMRIDING (BRS1467), 20, Nevett Street, Preston, Lancs.
J. THORPE (BRS1468), 2, Norton Lees Crescent, Sheffield.
D. T. BOFFIN (BRS1469), Market Place, Faringdon, Berks.
J. L. LONGHORN (BRS1470), Ennesdene, Stamfordham Road, Westerhope, Newcastle-on-Tyne.
W. H. LORD (BRS1471), Birch Villa, Lulworth Road, Birkdale, Southport.
J. ATKINSON (BRS1472), High Street, Horeham Road, East Sussex.
C. D. S. UNDERWOOD (BRS1473), 21, Pedlars Grove, Swaffham, Norfolk.
W. A. RICE (BRS1474), 12, George Street, Mansfield, Notts.
W. H. MASTERS (BRS1475), 66, Lumsden Avenue, Southampton.
A. CUCKSON (BRS1476), 226, Kilton Road, Worksop, Notts.
S. SOUTHGATE (BRS1477), 26, Fulbrooke Road, Cambridge.
J. HAYES (BRS1478), Crimble, Slaithwaite, nr. Huddersfield.
K. L. HOYSTED (BRS1479), 25, Westbourne Avenue, Rhyl, N. Wales
S. DAVISON (BRS1480), 10, Sydney Street, Scarborough.
H. A. LE TISSIER (BRS1481), Cliffdale, Albecq Castel, Guernsey, C.I.
T. L. CROSLAND (BRS1482), Widna, Beverly Road, Anlaby, Yorks.
S. HEMMINGS (BRS1483), 4, Red Hall Road, Lower Gornal, Staffs.
J. A. READING (BRS1484), 29, Herrick Road, Highbury, N.5.
S. WHITEHOUSE (BRS1485), 105, Lake Street, Lower Gornal, nr. Dudley, Staffs.
G. G. LIVESEY, B.A., 145, Monks Road, Lincoln.
C. H. ODLE (A), 58, Avonmore Road, W. Kensington, W.14.

DOMINION AND FOREIGN.

J. PIMENTA (CR8AA), Vasco da Gama, Portuguese India.
E. A. REYES, M.D. (KA1OR), 305, Misericordia Street, Manila, P.I.
M. SMIT (PAOLR), Amsterdam, Sluissraat 64, Holland.
S. H. COX (SU1AQ), No. 1 Co., Egypt Signals, Abbassia, Cairo.
E. A. HOLLIDGE (SU3EH), S.H.Q., R.A.F., Heliopolis, Egypt.
R. L. BELSTEAD (VK4EI), 2, Park Lane, Townsville, Queensland, Australia.
E. J. LAKE (VK4EL), 47, William Street, Kangaroo Point, Brisbane, Australia.
J. S. FOGG, JR. (W1DUJ), Rural Route 1, Box 144, Warren, Maine, U.S.A.
F. M. GILLETT (W6HX), 3715, Shannon Road, Hollywood, Calif., U.S.A.
V. K. VYVYAN (ZS5R), Poldhu, Richmond, Natal, S. Africa.
J. F. STOLIKER (BERS234), 401, Erie Street, West Windsor, Ont., Canada.
F. GOODWIN (BERS235), 30 (B) Squadron, R.A.F., Mosul, Iraq.

A Silent Key.

It is with very much regret we have to report the death, after a long and trying illness, of Mr. R. R. Sawell, CT1BK. Mr. Sawell had been our official representative for Portugal for many years, and had regularly supplied news of activities for the BULLETIN from that country. He passed away on March 3 last at the British Hospital, Lisbon. Our sympathies are extended to his wife, relations, and friends.

Teehnical Articles are Wanted

THE R.S.G.B. QSL SECTION.

An Explanation of Its Functions and Uses.

THE full use of the section is reserved exclusively for members of the R.S.G.B. and B.E.R.U., but non-members resident in the British Isles may collect cards forwarded by foreign societies to R.S.G.B. which are intended for them.

The Section gives to members a two-fold service. In the first place it collects and forwards to British amateurs cards which are received from the various radio societies of the world, and, secondly, it receives from members their cards for free distribution at home and abroad.

The methods employed in the operation of the Section are best dealt with under separate headings.

Cards for You.

These should be collected from the Section by means of stamped addressed envelopes, and the following points should be noted :—

1.—Overseas members may not collect their cards direct from R.S.G.B., except when no QSL Agency exists in their country.

2.—Envelopes must be stamped by the sender and clearly addressed.

3.—The sender's call-sign must be printed in block letters in the *top left-hand corner* of the envelope.

4.—Envelopes must be of standard size (6 ins. by 4½ ins.) or as near to these dimensions as possible. (Envelopes of the " paper bag " type and the commercial size cause the Section much needless trouble and waste of time.)

5.—If special instructions as to the number of cards to be sent in each envelope are to be given, they should be written immediately under the call-sign in the top left-hand corner, and should be in the form " wait for . . . cards." Envelopes are despatched where possible when there are three cards in the file for one call-sign, and the above applies only if this arrangement is not convenient. It is particularly requested that special instructions are not given unless really necessary. The Section cannot undertake to forward envelopes at stated intervals.

If it is not desired to go to the trouble of preparing envelopes for this purpose it is possible to procure them from the Section, already addressed, and stamped to the value of 1½d., at a price of 2d. each envelope.

Your cards will be kept for three months if you have no envelopes at Headquarters, and after this time they will be disposed of at the discretion of Council.

Cards from You.

The Section is in a position to accept for distribution cards addressed to any amateur in the world, and a rapid exchange of QSL cards is maintained with foreign societies. These cards are sent in bulk at regular periods, and it is therefore unnecessary to place each card in a separate envelope. The Section would be grateful if the following points are borne in mind when cards are sent for distribution :—

1.—Do not put any cards in envelopes but sort the cards together in countries (photographs should be pasted to the back of the cards).

2.—Letters cannot be accepted for distribution, as they are not permitted under the postal rate at which the cards are sent abroad.

3.—Write the call-sign of the station to whom the card is addressed, clearly and in large letters, so that it can be seen at a glance. If the space on the face of the card is insufficient or obscure write it plainly on the back.

4.—Weigh the packet carefully before despatch and make certain that the Society does not have to shoulder the all-too-common burden of excess postage.

5.—Address the packet to QSL Section, R.S.G.B., 53, Victoria Street, London, S.W.1, which is the only address of the Section.

Enclose no stamps as the service is entirely free to members.

TRADE NOTICES.

Ferranti, Ltd., send us details of their new Gloria Consolette type receiver, fitted with a 24-hour clock. Nearly perfect reproduction is claimed from the circuit, which follows superhet principles. The output of 2½ watts should prove ample for most needs, whilst the high excellence of the cabinet should satisfy the most fastidious taste. Among the 20 odd special features are an illuminated dial giving station names and wavelengths, an electric tuning indicator, full delayed A.V.C. and special tone control which is continuously variable. The receiver is listed at 22 guineas.

The Harken Electrical Co., Ltd., 18a, South End, Croydon, send us details of their new range of short-wave converters. These convertors are not mass-production jobs, but are designed by engineers with a long experience of short-wave practice.

The tuning coils are wound on special formers of " Silvonite," while the output transformers are Litz wound and impregnated to withstand excessive humidity.

In the mains model the mains transformer and chokes are similarly impregnated. The wavelengths normally covered are from 15 to 55 metres in two ranges, the change being effected by a simple change-over switch.

Three models are available : Type S.C.B. and S.C.M. for A.C. or battery operation, selling at £4 5s., and the A.C. mains model with power pack at £6 10s.

All models are supplied complete with valves in a well-designed cabinet.

REPORTS WANTED

G5WW (London, N.) on his 2 mc. and 7 mc. telephony transmissions.

Read and Keep the QSL Rules

NOTES and NEWS from the BRITISH ISLES

DISTRICT REPRESENTATIVES.

DISTRICT 1 (North-Western).
(Cumberland, Westmorland. Cheshire. Lancashire.)
MR. J. NODEN (G6TW), Fern Villa, Coppice Road, Willaston, near Nantwich, Cheshire.

DISTRICT 2 (North-Eastern).
Yorkshire (West Riding, and part of North Riding), Durham, and Northumberland (Middlesborough is in this district.)
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.)
MR. W. W. STORER (G6JQ), 28, Blanklyn Avenue, Leicester.

DISTRICT 5 (Western).
(Hereford, Oxford, Wiltshire, Gloucester.)
MR. W. B. WEBER (G6QW), 2, Balmoral Road, St. Andrews Bristol.

DISTRICT 6 (South-Western).
(Cornwall, Devon, Dorset, Somerset.)
MR. W. B. SYDENHAM (G5SY), "Sherrington," Cleveland Road Torquay.

DISTRICT 7 (Southern).
(Berkshire, Hampshire. Surrey.)
MR. E. A. DEDMAN (G2NH), 63a, Kingston Rd., New Malden, Surrey.

DISTRICT 8 (Home Counties).
(Beds., Bucks., Cambs., Herts. and Hunts.)
MR. G. FEATHERBY (G5FB), 30 Lindsey Road, Bishops Stortford Herts.

DISTRICT 9 (East Anglia).
(Norfolk and Suffolk.)
MR. H. W. SADLER (G2XS), Redways, Wootton Road, Gaywood, King's Lynn, Norfolk.

DISTRICT 10 (South Wales and Monmouth).
MR. D. Low (G5WU), "Nantissa," Westbourne Road, Penarth Glamorgan.

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. H. D. PRICE (G6HP) 12, Hillcrest Road, Sydenham, S.E.26

DISTRICT 14 (Eastern)
(East London and Essex.)
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. A. O. MILNE (G2MI), "Southcot," Larkfield, Kent.

DISTRICT 17 (Mid-East).
(Lincolnshire and Rutland.)
MR. A. E. LIVESEY (G6LI), Stourton Hall, Horncastle, Lincs.

DISTRICT 18 (East Yorkshire).
(East Riding and part of North Riding.)
MR. T. WOODCOCK (G6OO), 8, George Street, Bridlington.

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

NORTHERN IRELAND.
MR. W. GRAHAM (GI5GV), 5 Ratcliffe Street, Donegal Pass, Belfast

Messrs. Stacey (G6CX) and Lucas (G2OI) County Representatives, No. 1 District.

DISTRICT 1 (North-Western).

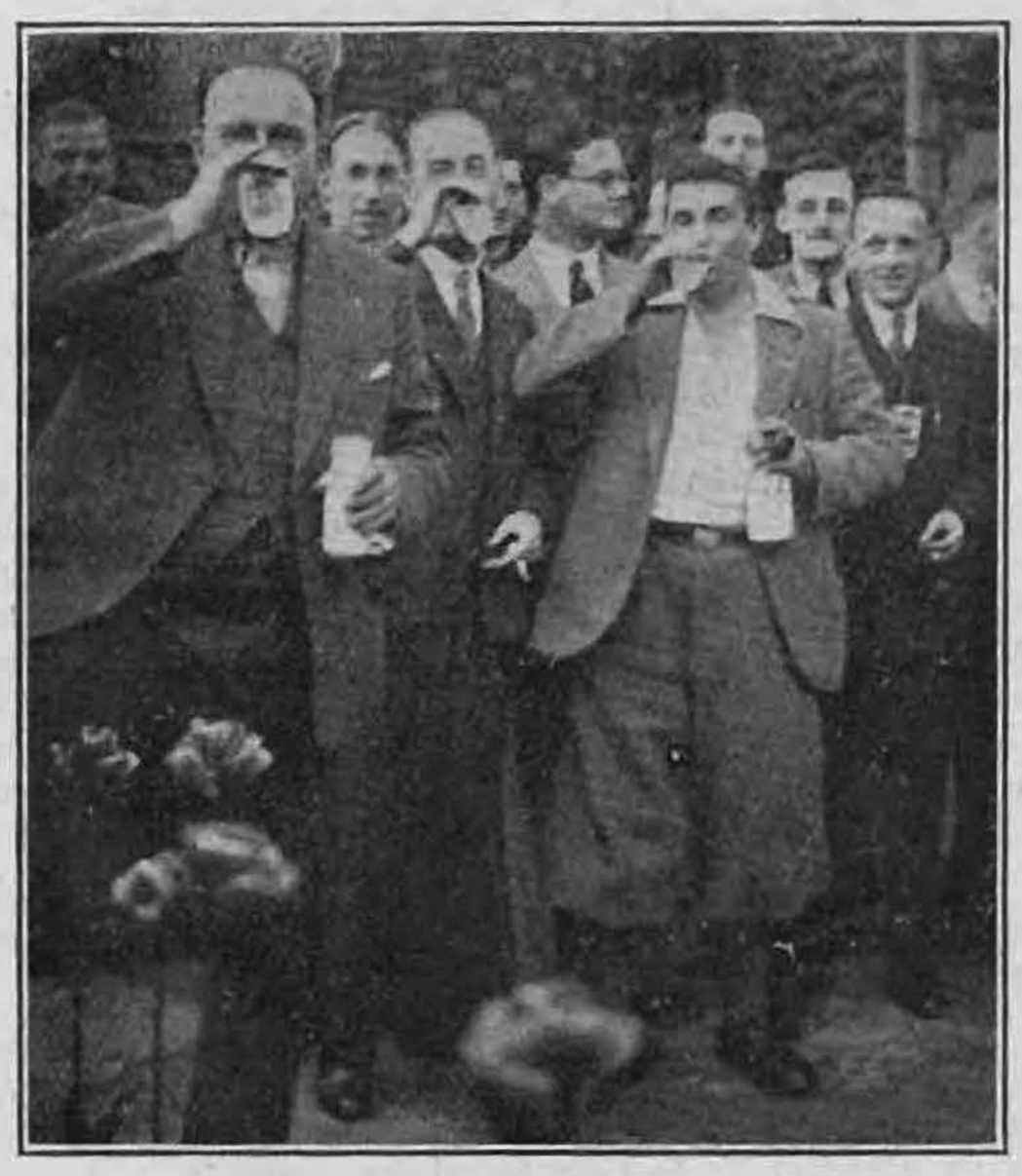
THE chief item of interest to report is the Conventionette, which attracted a goodly number from No. 2 District. We were honoured by the presence of our worthy secretary, also visitors from Districts 3 and 11. Thanks are due to them for their support. The meeting took place on June 3 at the Grand Hotel, Manchester, and after the usual greetings we all settled down to an excellent lunch. Then followed the business meeting, which the D.R. opened by greeting all present. A telegram was read from the President, and after expressing his thanks to the C.R.s for their district work, he made reference to the excellent way that his Manchester C.R. (G2OI) and his helpers had arranged the Conventionette. This was followed by each C.R. giving a general résumé of the work done in his part of the district. Next followed our secretary, who was enthusiastically received, and after more than an hour's talk, followed by the usual bombardment of questions, he expressed his thanks for the work effected by each officer in the district. The usual votes of thanks were given and responded to, then all retired to tea, and at 6.30 p.m. station visits commenced. I think I am expressing the voice of all when I say a very enjoyable day was spent.

In regard to N.F.D., each C.R. has something to say, but my thanks are due to all for their efforts. After congratulating my C.R.s, I must not overlook G2OA. Thank you, O.M., for your part in the supervision of the "B" station.—G6TW.

Although the June meeting at Liverpool was not quite so well attended as previous meetings there was quite a good muster, despite holidays and outdoor attractions. The usual "inquest" was held on N.F.D. results. Apart from the fact that the score obtained was not as good as had been hoped for the general opinion was that the results were satisfactory. G6CX proposed a vote of thanks to G2OA, who built and installed the transmitter;

2AVK, who covered about 250 miles in his car, transporting batteries, equipment, and operators; and to all those who provided gear and assisted in establishing the station. This was seconded by G6TT, and carried in the usual manner.

The meeting then listened to a most interesting lantern lecture by Mr. Salmon (G6RW), of the G.E.C. Slides were exhibited showing the construction of the "Catkin" valves through all stages, and after the lecture a number of valves were examined, including D.E.T.6, D.A.100, D.E.T.1 and numerous smaller ones, even "Pea nuts" developed specially for portable battery sets. At the next meeting, after G6TT's talk, it is proposed to make final arrangements for the 56 mc. field day to be held on July 22 in conjunction with District 11.



Strange, But True.

A group of milk drinkers outside G2WQ's station at Broughton Park, Manchester. Mr. Vaughan Williams (G6IW), Mr. A. E. Dyson (G6NJ), Mr. Lucas (G2OI) and our Secretary turn teetotal for the occasion. G2WQ is between G6NJ and G6IW.

June was a very busy month for the Manchester section.

Sixteen members attended the meeting on June 6, when a very interesting talk was given by Mr. Fairhurst on meters and their uses; a display of different types of meters by Ferranti, Ltd., at

District 1 recorded an attendance of over 50 at the Manchester Conventionette, June 3, 1934.

various stages of construction was on view during the talk. (Afterwards Mr. Fairhurst signed an application form for R.S.G.B., and I would like to take this opportunity of welcoming him into our Society.—G2OI).

Much fun, as well as serious work, was obtained during N.F.D. Ten members stayed the night under canvas, and visitors came and went all through Sunday. 6ZU's air cushion bed was a thing of wonder, and we still feel anxious for his safety after the explosion! May I go into rhyme?

2WQ and Mr. Brown a site they have decided
To all the fellows of No. 1 their secret they confided.
2OI and 1114 climbed miles with poles on shoulders,
While 5ZT and 5SO motored up among the boulders.
2HM and 2BK brought tents and pegs and kettle,
And soon the air was full of sounds of men upon their mettle.
"Say, 6ZU, where is that screw, HM, where is that driver?"
While 2AZT is brewing tea to give us all a livener,
Old 6GV and 2GA are hard at work and sweating.
And soon the gear is all fixed up, and contacts we'll be getting.
The first pip out R9 FB, we all feel very frisky.
And so we settle down to make a very happy field day.

G2OI.

G5YD is working on a new electron-coupled oscillator circuit (details later), while 2RA has put up a new 5-metre antenna high in the sky; we await results with interest. The following report active on one or the other bands:—G2BK, 2GA, 2DF, 2HL, 2HM, 2OI, 2RA, 2WQ, 5VN, 5WR, 5XM, 5YD, 5ZT, 5PX, 6AX, 6GV, 6QA, 6ZS, 6ZU, 6TW, 2AZT, BRS770, BRS1114.

DISTRICT 2 (North-Eastern).

The District's "B" station was organised by G5HK, of Sheffield, but unfortunately no great interest was shown prior to the day by the members in that area. The major portion of the construction and operating of the station was carried out by G5HK, assisted by G2AS and G6LF. On the

actual day operators were plentiful, and had it not been for repeated bad luck with the power supply a much better score would have resulted. Up to the time of writing no report has been received from the Newcastle area regarding the operation of the District's " A " station.

Members in the Middlesbrough and South Durham area ran a portable station on Whinney Hill, Durham, during N.F.D. using the call G6CV. Much valuable help was given by the following members, who remained on duty during the full period of the contest: G2FO, 2HZ, 5QU, 5RC, 5XT, and 6ZT. From this area G5QU reports having worked Japan using low power, and 5XT is now W.B.E. and W.A.C. The next series of lectures for members in this area have been compiled by G2HZ.

Activity in the Bradford area is being fully maintained and a 56 mc. Field Day has been successfully arranged, reliable communication having been effected up to two miles, using an input of 2 watts. Several members attended the Manchester Conventionette, and as a result of a visit to G6QA they are busy making ribbon-type microphones, having had one demonstrated there with very good results.

A 1.7 mc. direction-finding Field Day will have passed by the time these notes are in print; details will appear next month. Congratulations to 2ASF on obtaining his full call G2UY. This is the second new station in the Bradford area, the other being G2QM ex 2BGU. Both of these members will welcome reports on their transmissions. Inter-station visits are being resumed for the purpose of exchanging ideas, particularly with a view to helping non-transmitting members. The first meeting was held at G5TQ, and members will be notified of future gatherings. Nearly every station in the Bradford area is active, which is a good omen and speaks well for the general enthusiasm of all concerned.

Over 50 members and friends attended the District Conventionette in Leeds on July 1. Welcome visitors were Mr. E. D. Ostermeyer (G5AR) and Mr. J. Clarricoats (G6CL), Mr. Lucas (G2OI), with an active Manchester contingent, and the Burton twins, " Dy and Jeff " (G6NJ and 2AMN).

An hour of friendly " rag chewing " preceded the business meeting. In opening the latter, G6PY expressed his pleasure at seeing so many new and old members. He read a telegram of good wishes from the President, and then called upon the following to give an account of the activities in their area: Messrs. Raynor (G5TQ), Hornby (G5QY), Garrard (G6CV), and Sharpe (G6KU).

The secretary followed, and in a (for him !) short address gave an interesting account of general Society matters, including some views on television.

DISTRICT 2 CONVENTIONETTE, LEEDS, JULY 1. 1934.
Sitting L. to R.:—G2QM, 6BX, 2OI, 6NJ, 6CL, 6PY (D.R. No. 2 District), 5 AR, 5TQ (West Riding C.R.), 6KU, 5QY (Northumberland and North Durham C.R.), 6ZT.

At the conclusion of his talk a discussion took place regarding future North of England Conventionettes. On a proposal made by Mr. Jackson (G6ZU), a vote was taken to ascertain whether the district would support a North of England Conventionette arranged in Blackpool. No less than 18 members voted in favour, consequently steps will be taken to set the proposal into effect in conjunction with other Northern districts.

A high tea (or was it late lunch ?) followed, and eventually, at about 7 p.m., 20 or more members set off to visit G6PY.

Mr. Shaw (" Tuner," of the *Yorkshire Observer*) was a welcome visitor, and the secretary, during his speech, personally thanked him for the many services he has rendered the Society.

Altogether a very fine show with but one blot: although held in Leeds, only two local members were sufficiently interested to give us their support. Our views regarding the others is best left unsaid.

DISTRICT 3 (West Midlands).

Reports are, as usual, scarce. BRS1066 sends a very interesting list of countries heard on 28 mc. between 17.45 and 19.00 G.M.T. on June 1; these were: F8, FM8, OE, OK, ON, D4, PA. G6NJ reports W6 stations at R9; he has also QSO'd a few W6's. G5BJ has been making alterations, but will be active again before these notes appear.

The District members are holding a 56 mc. Field Day on Sunday, July 22; there will be four stations in operation—two fixed and two portable, the calls being G2KB, 5BJ, 6DL, and 2AK. The event will start at 08.00 and finish at 19.00 G.M.T.

N.F.D. went off very successfully and was enjoyed by everyone; the 56 mc. Field Day is an outcome of that event.

DISTRICT 5 (Western).

The outstanding feature of the month was naturally the National Field Day, which was an unqualified success in every way.

The D.R. conveys his appreciation of the loya support given by district members to this event, and thanks one and all for their enthusiastic efforts to lift the "N.F.D. Award."

The two stations were operated as arranged and both scored more points than they obtained last year.

Station A, G2HX, located at Painswick Beacon, had 58 contacts and scored 151 points, their best DX being U3CL near Moscow. District members from Stow-on-the-Wold, Chippenham, Gloucester, Painswick, and Bristol supported this station.

Station B, G6RB, located at Dundry, secured 60 contacts, and scored 209 points, their best DX being various ZL's. Most Bristol members supported this station. The District total was 118 contacts for 360 points.

During the tests it was noticed that G portables were always consistent and strong. General conditions were not exceptionally good although some other stations reported that they were. The score of 360 points is very satisfactory inasmuch that scoring was slightly more difficult this year than last.

The monthly meeting of the Bristol section was held as usual, and well attended.

Local Field Days are being arranged and the C.R wishes to know whether members prefer 56 mc. or 1.7 direction-finding tests. The Gloucester section are also arranging Field Days, and welcome support from other counties.

Wiltshire letter budget although still going strong, welcome more contributors. Oxfordshire held another 56 mc. F.D. during the month.

The entire District regret that their late D.R. (G2OP) has left the district and moved to Pembroke Dock. They thank him for his support at the N.F.D., and wish him luck.

DISTRICT 6 (South-Western).

Chief interest last month centred around National Field Day. Many members spent considerable time preparing for this event, and there is no doubt that the District did well as a result. No. 6 did not enter the competition last year, owing to the difficulty of making adequate arrangements in the time available, but this year we were prepared for it, though in some ways we felt the lack of experience that the other districts had obtained in the previous year. Under these circumstances a total of just over two hundred points may be considered very satisfactory. We can see now where several improvements could be made, so no doubt next year we shall be able to make a still better showing.

Station "A" could only muster a total of 63 points, but this must be considered very meritorious, because they had to carry on, through a "technical hitch," with an input of only 7.2 watts for nearly the whole of the contest. This power was derived from 240 volts of dry batteries. The D.R. would here like to place on record his appreciation of the magnificent way in which G5YB kept his end up at the "A" station; owing to lack of operators he was working for considerable periods on his own. The D.R. would also, on behalf of the operators at station "B" like to thank BRS836 for turning up and without any special request taking on the very uninteresting job of washing dishes. True ham spirit!

On 28 mc. commercial harmonics and Continental staions have been heard. Our old 28 mc. friend G2FN has been busy on this band and has been making contacts.

There is still some activity on 56 mc., and several members announce their intention of taking up work on this band. The D.R. was able to show his extremely compact 56 mc. transceiver to quite a number of people during N.F.D., and raised a good deal of interest. This set comprises a detector and pentode with transformer coupling and choke output to the 'phones, the choke also being used for plate modulation. The set measures 7 in. by 6 in. by 3 in; can anyone beat this? (Why not describe it in the BULLETIN?—ED.)

Will Exeter members please note that a newcomer has arrived in that city, namely G5ZD, from Leicester. Welcome OM.

Evidently owing to the excitement of N.F.D. preparations, the new Budget arrangements did not work too well at first. Will all members please make an effort to keep the next issues moving smoothly? Also, if anyone has any suggestions worthy of consideration at Convention, will he please let the D.R. have them?

DISTRICT 7 (Southern).

The high lights of June naturally centred round N.F.D. and the Conventionette. The N.F.D. stations were run at Walton-on-the-Hill and Farnham Park, as arranged, and the event was voted a great success by all who attended. Visitors included SU1MM, who is now stationed at Aldershot, and G6MN from Worksop, who was in London on business. The weather was more kind to us this year, and at "B" station over 40 took tea, provided once again by our very good friend, Miss N. Corry (G2YL) assisted by Mrs. Alliston. As N.F.D. is to be reported upon fully in next month's issue no more need be added here, except to say that the combined score of both stations was 322 points, which should put us higher in the table than last year. The D.R. is making up a photographic "letter" budget incorporating the numerous snaps taken at both stations, and all contributions will be appreciated.

The Conventionette was held at Weybridge on June 24, and attracted a record attendance for this

district, over 50 sitting down to lunch which, unfortunately, had to be taken in two batches due to staff shortage at the hotel. We were especially pleased to see so many visitors from other districts, including VQ4CRH and 4CRR, G5KT, and three other members from Bristol, G6HB (VU2FP) from Bedford, our Treasurer (G5AR), and Secretary (G6CL). We must also award a special medal to G6BU, who cycled all the way from the Isle of Wight. The business meeting followed lunch, and was opened by G6NK and G6GZ reading their respective county reports. The D.R. made a few remarks on the subject of R.E.S., and our Secretary then gave his usual informative chat on Society matters in general. Question time failed to draw a single question or grouse, and goes to show that in No. 7 district things seem to be running very smoothly. The D.R. called upon some of the visitors for short talks dealing with amateur radio matters in distant parts of the Empire, which made some of us realise how lucky we are to be in England! The meeting broke up after tea at 6.30 p.m. with the usual round of station visits.

DISTRICT 9 (East Anglia).

We must first express our thanks to those responsible for producing such a magnificent birthday issue of the BULLETIN; they must have worked like Trojans.

Field Day this year found us all in fine form, even if there are not many of us in the District. We found it very difficult to get enough operators, although we managed to keep in operation for 20 out of the 27 hours, so we shall no doubt be in the list somewhere, even if at the bottom!

The D.R. was sorry not to see any of the Suffolk members in attendance, but he realises it was a long trek for them. The station would have been nearer to that county, only the best thing we could find for the job was a motor removal van, and that costs a lot to move very far!

All energy must have been used up at N.F.D., for no reports have come from anyone since that date. Do not forget next month OMs.

The following stations report active: G2MN, 5UF, 6ZJ, BRS1401, 1411, 1421. BRS1411 is staging a short-wave window display in Norwich, from which it is hoped to obtain some new members.

DISTRICT 10 (South Wales and Monmouth).

Our activities this month were mainly concerned with N.F.D., and although better results were anticipated, the fact remains that our total shows some improvement on the previous year, which is a step in the right direction. Some unusual difficulties were experienced at station "A" and station "B" was extremely unfortunate in having power trouble. It was a delightful week-end, thoroughly enjoyed by all.

Our meeting on June 14 was well attended, and as N.F.D. was discussed in detail, it would seem that there is every prospect of making even more suitable arrangements for this event next year.

It is pleasing to record increased activity in the Swansea area, and reports to hand indicate that G5TW is putting in a lot of time on 7 and 14 mc., and obtaining very satisfactory results. Similarly, G2TY, 2UL and 2SN are active, together with G2WO (ex-2AWN), who, we are pleased to hear, is now fit again and operating on 7 mc.

DISTRICT 7 CONVENTIONETTE,
Weybridge, June 24, 1934.
Mr. E. A. Dedman, G2NH is to the left of Miss N. Corry, G2YL, and at the feet of G6CL! His R.E.S. responsibilities seem to have got to his head! VQ4CRH is in prominence at the right hand end of front row. G6CW is to the right of G2YL, followed by G6MN and G6GZ. G5YH is the fuzzy blur in the top left-hand corner!

Except for a few absentees on holiday, the eastern area of our district is as active as ever, and a report from Mr. Mudford, of the Blackwood Radio Society, indicates that the Society is actively interested in field day receiving stations. The D.R. would like to have further news regarding this fine effort.

DISTRICT 11 (North Wales).

The D.R. wishes to apologise for the absence of District Notes last month, but this was due to being so busy with N.F.D. gear.

Thanks are due to District 1 for the excellent way in which they entertained G6IW, and BRS 1156 and 1211 at the District 1 Conventionette.

All members will be grieved to hear of the sudden death of Mr. W. H. Evans (2BWU). Although a non-member, he has done much in the past to help members of District 11, both on 56 mc., and also during the recent N.F.D. at our A station.

It is too soon to say much about N.F.D. results, but we feel very satisfied. Members present at A Station were G6IW, G2FF, and BRS 1156, 1191, 1202, 1211, 1303, and 1366. Our thanks are due to Mr. David Evans for his excellent cooking, and to Mr. Frank Mortimer for permission to use his land for our N.F.D. site.

DISTRICT CALENDAR

July/August, 1934.

JULY 18. District 1 (Liverpool Section). Talk by Mr. C. Askham, G6TT, "Commercial and Land Line Telegraphy."

JULY 29. District 14. Meeting at G6KV, High Road, Laindon Hills, Essex, at 4 p.m. Train leaves Fenchurch Street, 2.45 p.m. and Barking 3.16 p.m.

AUGUST 1. District 1 (Manchester Section). At Brookes' Café, 1, Hilton Street, 7 p.m. Open debate and discussion.

Present at our B Station were G2BJ, G2II, and G6OK, who transported, erected, and operated the station.

G6OK is experimenting with a Pentode CO transmitter similar to the one recently described by PAOFY—keying in the auxiliary grid circuit Excellent results have been obtained using 7 mc. fundamental crystal.

Activity is as follows :—1.7 mc., G2II and G6IW. 7 mc., G2BJ, G2II, and G6OK. 14 mc., G2II.

DISTRICT 12 (London North).

An extremely interesting meeting was held on July 3, when Viscount Carlow (G6XX) and Lieut. Beaumont (VU2FP) were visitors.

N.F.D. results were critically examined and plans made to hold the next meeting at the 10th Finchley Group Hut on September 29.

Mr. Clarricoats, introducing Lord Carlow to the meeting, explained that as Wireless Officer of No. 600 Auxiliary Air Force Squadron located at Hendon, he was desirous of augmenting his wireless unit by the addition of four or five keen amateurs. Lord Carlow, in a most interesting talk, drew attention to the many advantages of Air Force training and gave a personal account of various flights in which he had participated. Those present showed keenness in his talk, and it is anticipated that No. 12 District will provide additional operators for the Squadron. Lord Carlow intimated that he would be glad to hear from other interested members living in the London area.

Lieut. Beaumont was then invited to give some information regarding amateur radio conditions in India. His remarks were listened to with interest, and as a result all present were made to appreciate fully the difficulties underlying the operation of an amateur station in India.

The last hour was devoted to informal discussion.

The D.R. is anxious that No. 12 shall take its place with the other London Districts during Convention in providing accommodation and generally entertaining provincial members. All offers of assistance should be communicated to him without delay.

Arrangements will be made to operate at least one 56 mc. station during Convention Sunday; interested members are requested to advise the D.R. immediately.

The letter budget, as anticipated, has been badly delayed; steps are to be taken to improve this important district feature.

National Field Day was enthusiastically supported, and on behalf of the District the D.R. wishes to convey his personal thanks to all who assisted, especially to Mr. Price, of Dugdale Hill Farm, for permission to erect the B station on his land at Potters Bar.

The District score was 284 points, "A" contributing 128 and "B" 156 points.

DISTRICT 14 (Eastern).

The District Conventionette held at the Palace Hotel, Southend-on-Sea, was disappointing as far as numbers were concerned, only 22 attending, including four ladies. It would appear that certain members are tiring of Conventionettes and meetings, as so many have taken place recently. With the exception of two or three members from Kent, no other visitors supported the meeting, although our Secretary attended in company with Mr. Ostermeyer and delivered one of his invigorating talks.

The June meeting held at Chingford was also poorly attended. Congratulations are offered to BRS29 who is now 2AYB, also to BRS1231, who is now 2ANS. It is understood that G6FY (PA0FY) will be back again in the district during August. There will be no East London meeting during July, but a Sunday afternoon gathering has been arranged at G6KV; for details see district calendar.

Will members wishing to take part in the 56 mc. Field Day to be held on Convention Sunday, communicate with the D.R. without delay?

DISTRICT 15 (London West, and Middlesex).

About the only thing worth commenting upon this month is National Field Day, and the memory of the wonderful "team spirit" shown during that week-end. Those who were either unable or could

not see their way clear to be with us missed a splendid time.

For the benefit of other districts the following will give an idea of the two camps. G6WN had one operating tent, one for stores, and three for sleeping, while G6YK was housed in a marquee and two bell-tents.

It was a great pity that the 14 mc. transmitter was out of action for most of the week-end owing to a short circuit, which was responsible for burning out meters and chokes. With this handicap a great number of points were missed and only one contact was made on that band.

Thanks are due to both Mr. Saich, of Rush Green Farm, Denham, and Mr. Jarvis, of Mantles Green Farm, Amersham, for their hospitality. Mention must also be made of the BSRS1 crew for the loan of tents and assistance with cooking, etc.

No further District meetings will be held until September.

District 16 Conventionette, Larkfield, May 27th, 1934

Group taken at a recent Scarborough meeting. Front row, left to right: G5CU, 6AW, 6OO and 5FV. G6UJ with pipe in centre.

DISTRICT 16 (South-Eastern).

The most important event of the month was, of course, N.F.D. Both stations put up a very creditable show. All the portables were worked from the "A" station, and contacts with ZL, VP, ZC, and W were made from the "B" station. Although the running of the "A" station was left to the Medway district—we were glad to have a visit from G5FJ. Especially also were we pleased to be honoured with the presence throughout the day of VK2NR.

Conditions on 14 mc. are excellent just now: G5FN, 6QC and several others have worked W6. 6QC also has a report from Japan.

G2IG has built a single-signal-super to his own design, which the D.R. has had an opportunity of testing and can confidently pronounce as "the goods!"

The whole district joins with the D.R. in wishing Mr. and Mrs. "Ham" Whyte the very best of luck in their self-imposed life sentence! The monthly meetings continue to be well attended in North Kent.

Tunbridge Wells are hard at work on 56 mc. Local tests are taking place every week. G5OQ and BRS1441 both recommend the Marconi aerial.

In Folkestone everyone is studying morse. Mrs. 6XB, who is an ex-P.O. telegraphist, invited the "boys" up to see her some time, and is now holding regular classes!! 2BBO awaits his full licence; 2ASC and 2BAX are well on that way. BRS1308 is now 2BKG. The C.R. is rather nervously figuring out the cost of a single signal snatcher!!

Heartiest congratulations to 2BGR, who is now G2QT. Our little "QT-ie" lives at Smeeth, but regularly attends the Folkestone meetings.

Now then, Ashford, what about a meeting in your area?

Practically all the active stations in Sussex have reported this month. G5JZ has worked G2AO with pure C.W. on 56 mc., being reported R5, T9, QSA5 on a straight receiver.

The Heathfield membership is increasing, thanks to G5JZ.

G2AX has done some excellent 'phone DX on 14 mc. G2CF is on 56 mc. and is also experimenting with a half-wave aerial on 1.7 mc.

G2MC, we are glad to say, is much better in health. We wish him a speedy recovery. G5UY and BRS1173 also report active.

The D.R. is glad that Sussex is waking up at last. Now keep it up, OMs !

DISTRICT 18 (East Yorkshire).

National Field Day over, we breathe freely again. We have great hopes of landing the trophy for our District, our " B " station scoring 202 points and our " A " station 117, giving a total of 319. Altogether a most enjoyable N.F.D. event, with 14 members present.

Mr. Gill (of Scarborough) becomes G5GI, congrats om. 2AMM is busy rigging television gear, 5VO building portable 56 mc. gear with 2APU assisting.

Monthly meetings of the Scarborough short-wave Club will in future be held at the Belle Vue Hotel, Scarborough, on the first Monday in each month. 2AUN is busy on receivers (testing an AC2 Pen. in place of 24M, etc.) and television gear.

No other members report active, but 5FV is busy on 28 mc. with good results.

G600 is rebuilding his main transmitter and carrying out 56 mc. work from the home station and with portable car gear. The D.R. takes this opportunity of expressing on behalf of all No. 18 District members our great appreciation of the splendid work put in by Headquarters to produce the Society's birthday number of THE BULLETIN.

NORTHERN IRELAND.

National Field Day is but a memory once more, but rather a pleasant one this year. Station A scored 97 points with 39 QSOs, with XHB9AG and XHB9K as DX. Station B scored 113 points from 42 QSOs, DX being SU1A and W2EBI. The total score of 210 is quite a good effort when one considers that N.F.D. is the only field event held in GI.

During the contest conditions were quite poor on 7 mc., while 14 mc. was practically unworkable, not more than ten different stations being heard during the event. The 3.5 mc. band, on the other hand, was quite lively, being the best band in use. QRN and QRM made 1.7 mc. very difficult to work.

During the contest, some unauthorised person used the Station B call sign, *i.e.*, GI6YW, and made contact with at least one G portable on 7 mc.

Our very best thanks are due to Messrs. Siemens, who very sportingly supplied sufficient of their " Popular " type batteries for H.T. for both stations ; to Messrs. Morton (GI5MO) and Allen (GI6YW), who organised Stations A and B respectively ; to Messrs. Morton and Brown for their culinary efforts at Station A, and to Mrs. Allen and Miss Ling, who " fed the brutes " at Station B, and to all and sundry who co-operated to make the event a success.

Station A was operated from a caravan which was found to be available on June 8, the sleeping quarters being upwards of a mile away, so keeping the hilarious throng away from the operating position—yes, a little bird had been whispering. Station B was operated from a disused outhouse, and six bats and one bird nesting on a beam kept the operators amused throughout the night, when things were very quiet. 5GV was the first to keep watch " under the sheets," and after determined effort was just passing into the land of dreams when—" Who took the ace ? I'll go misere, etc. etc." . . .

Congratulations to GI5MO on the arrival of a junior operator and heir to the estate.

We have also to congratulate GI5JN, who has tied the marriage knot, and we wish Mr. and Mrs. Milliken every happiness.

GI6WG has now obtained his W.A.C., having worked the necessary countries so far back as 1929 ! Since that time he has been one country short for W.B.E. and a recent QSO with SU has enabled him to obtain the certificate.

We have two new members this month, Messrs. Pinkerton (BRS1454) and Sullivan (BRS1456), and extend welcome to them.

G2ZC (CHANNEL ISLES) VISITS HEADQUARTERS

AS a provincial amateur of not a few years' standing, and being in London, I overcame a natural shyness that has always been a thorn in the flesh, hired a taxi, and got myself deposited outside 53, Victoria Street, for the first time. My chief reason for the visit was to meet our Secretary and his assistants personally, see what they were like, and what they did. In the first place, as a purely provincial member, who, having gained the impression from many others of the same standing, that nothing was ever done at " 53," I got a shock ! On entering, I found our Secretary writing a business letter, telephoning a member about a ham matter, and between the two, giving me a friendly greeting, all at the same time. Miss Gadsden (the mysterious " M.G. stroke," on many H.Q.-typed letters), not only was attending to a pile of letters, but seemed to have a natural gift of being able, at the same time, to attend to questions from (*a*) the Secretary, (*b*) two other members, and (*c*) my own requests for various publications. In the ante-room, another lady was busy over QSL cards, and in fact, so busy was she that I never heard her speak, nor did she seem to have many other interests in life than the sorting of those cards. It struck me that the QSL hunter would have turned a vivid green had he seen the choice of cards displayed before him, and I had a sneaking sort of desire, similar no doubt to the bank bandit who sees a pile of bank-notes lying before him. Anyway, those who grouse about the QSL service can only take my word for it that the cards being dealt with at H.Q. exceed any picture I have ever had in my mind, regarding the quantity.

Candidly, I was amazed at the work being done, and being done most efficiently. No doubt I outstayed my welcome, but who would not ? As it happened, my visit coincided with the evening of a Council meeting, and as I had often heard that Council consisted of a mysterious body of men, bent on their own interests, I stayed on in order to see

(*Continued on page* 46)

Empire B.E.R.U. News.

B.E.R.U. REPRESENTATIVES.

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

Bahamas, Bermuda and the Eastern Part of the West Indies.—P. H. B. Trasler, (VP4TA) No. 2 Mess, Pointe à Pierre, Trinidad, B.W.I.

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

Canada.—C. S. Taylor (VE1BV), Stewiacke, Nova Scotia; R. Prissick (VE2CX), 27, Bellevue Avenue, Westmount, Montreal, P.Q.; S. B. Trainer (VE3GT), 4, Shorncliffe Ave., Toronto, 5, Ont.; A. E. Howard (VE4CJ), 2401, 25th St. West, Calgary, Alberta; and A. L. Cusden, (VE5HJ), 1465, 17th Avenue, New Westminster, British Columbia.

Ceylon and South India.—G. H. Jolliffe (VS7GJ), Frocester, Govinna, Ceylon.

Channel Islands.—Capt. A. M. Houston Fergus (G2ZC), La Cotte, La Moye, St. Brelades, Jersey.

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

Hong Kong.—A P. Rosario (VS6AN), P.O. Box 391, Hong Kong.

Irish Free State.—Col. M. J. C. Dennis (E12B), Fortgranite, Baltinglass, Co. Wicklow.

Jamaica, British Honduras, Turks Island and Cayman Island.—C. M. Lyons, (VP5MK), P.O Box 36, 12, Port Royal Street, Kingston.

Kenya, Uganda and Tanganyika.—R. O. Davidson (VQ4CRL), P.O. Box 31, Nairobi.

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

Malta.—H. G. Cunningham (BERS.161), H.M.S. "Royal Sovereign," c/o G.P.O., London.

Newfoundland.—E. S. Holden (VO8H), Box 650, St. John's, Newfoundland.

New Zealand.—C. W. Parton (ZL3CP), 69, Hackthorne Road, Cashmere Hills, Christchurch.

North and South Rhodesia.—J. W. Mavis (ZE1JE), P.O. Box 160, Umtali, South Rhodesia.

North India.—J. G. McIntosh (VU2LJ) Baghjan T. E. Doom Dooma P.O. Assam.

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

Ceylon.

By VS7GJ.

We welcome a report from one of our mid-country members, VS7RP, who has been working on 7 mc. He finds conditions generally bad, with heavy QRN, as do VU2FY and VU2JP in South India, although the former reports 14 mc. band as active.

VS7GJ has temporarily given up work on 7 mc., owing to QRN, but stations to the North, Japan, and Asia, are coming in well on 14 mc. General conditions at the moment are unreliable.

VS7GJ has worked Assam and F.M.S. on phone; distance 1,800 miles, and will welcome other reports if heard.

Channel Islands.

By G2ZC.

In spite of the fact that every member has received two letters from me outlining our policy, etc., only two have taken the trouble to send me a report. These members are G5OU and BRS1162. The latter is experimenting with a new type of coil, of which we hope to hear more later; whilst G5OU is, like G2ZC, keeping schedules on both 3.5 and 7 mc. G6OX and G2UR are active. G2ZC has contructed a sub-standard frequency meter as described in the BULLETIN by G6NF, and this is now on test. It had originally been decided to hold a miniature Conventionette during August, but owing to lack of interest the idea has been dropped. The matter will receive attention again next year.

Egypt.

By SU1EC via G5YH.

Conditions during the month of June were fair to good, but poorer than during May, although an improvement over corresponding month last year. Weak West coast, middle and Central American stations have been heard in the early mornings, whilst Japanese stations have been received between 13.30 and 16.30 G.M.T. Those operating the N.F.D. station in Cairo SU1X had poor results, due to a bad receiver, and a hot week-end. The Alexandria station SU1A was blessed with better climate, and reported better results. The temperature in Cairo during the summer does not go hand-in-hand with keenness as far as amateur radio is concerned.

There is some controversy regarding the new Broadcast station, because the programmes offered have little interest to the European listener. As the annual receiving fee is 16s. plus 1s. per valve, feelings run high over the type of programme radiated.

It is anticipated that new amateur transmitting

licences will soon be issued to SU amateurs; these will be on the lines of British licences, and frequency control will be insisted upon when inputs above 10 watts are used. The annual licence fee is expected to be two guineas.

SU1EC and 1AQ are active in Cairo, 1CH has not started up yet, whilst 1SK and 6HL are temporarily QRT. 1RO is a new member in Alexandria, 1SQ is active, 1TM has been finding that the presence of r.f. in common transmitter and receiver leads is expensive, as far as valves are concerned! 1SJ is using a current-fed full-wave Hertz on 14 mc., and finds it to be very satisfactory.

Hong Kong

By VS6AQ via G6AC.

The 7 mc. band is now useless for DX owing to static, but excellent patches occur on 14 mc. G stations are heard and worked regularly between 16.00 and 19.00 G.M.T. VS6AQ has qualified for W.B.E. and works on 14,302 kc. most nights.

VS6AH has completed his new transmitter and will be on 14 mc. shortly.

Irish Free State.

By EI2B.

The present spell of fine weather has apparently been responsible for a lack of activity amongst EI stations, the only stations reporting being EI4D, 9D, 6F, and 5F. EI2B has been active on 14 mc., and as he has received several cards for QSO's on 7 mc. at times when the station has not been on the air at all it would appear that someone is making unauthorised use of his call. The I.R.T.S. propose holding a D.F. Hunt on some date in July, not yet fixed, but probably towards the end of the month. EI9D has been appointed Vice-President of the I.R.T.S., a very popular appointment. We have to welcome a new EI station, EI8F, owned by Mr. M. Dalton, 38, South Frederick Street, Dublin. This is, however, his business address and I do not yet know whether it is the correct QRA of his station.

Northern and Southern Rhodesia

By ZE1JE.

Glad to report a marked and very welcome improvement in local conditions. On the 7 mc. band DX signals are now coming in from all directions after 19.00 G.M.T., from which time up to about 23.00 G.M.T. the band becomes so congested with fone and CW that it seems almost impossible to make a DX contact with anything under 100 watts input! G's are coming in in fine style from 20.00 G.M.T., 2MI was logged at 20.30 G.M.T. on June 17, a steady W5 R5 also, 6IN, 2RF and 2WD, but no contacts were made; apparently ZE1 signals were lost in the medley!

G. E. King (ZE1JF) has completely dismantled, and is reconstructing his transmitter on the link-coupling system. This station is very progressive, and will eventually become our E.L.S.

W. G. Leyland (ZE1JM) has been transferred from Umtali to Salisbury, and will not be on the air again for some time.

I. de B. C. Fynn (ZE1JH) is in England on leave, and has visited HQ.s. It is anticipated he will attend and represent the Rhodesias at Convention.

J. W. Mavis (ZE1JE) appears to be the only active ZE1 station at the time of writing (June), and is making good use of the improved conditions on the 7 mc. band. He is operating on 7,050 kc., and would greatly appreciate G QSO's or reports.

With reference to VS3AC's inquiry, Malaya notes, May BULLETIN, the fee demanded in Southern Rhodesia for an experimenter's licence is £2 per annum, maximum input 50 watts.

Northern India.

By VU2LJ.

There have been a few personnel changes in India recently; 2BG has gone home to G on a well-earned leave, and both 2AB and 2AT have been transferred to the N.W.F.P. The former has been QRT owing to his generator developing trouble, consequently he is devoting his time to low power 56 mc. work. He wishes to get in touch with members interested in weather phenomena. 2AT has also been bitten with the 56 mc. "bug."

Ex-YI5LG, ex-YI7RH and ex-YI2DS have all arrived in India, and it is hoped they will be swelling the ranks of VU brasspounders as soon as their licences come along.

VU2LJ is back on the air, but owing to the lack of D.C. mains is very QRP. Most of the time has been devoted to fone work; using grid modulation of the P.A., 100 per cent. readable speech was put over to VS6AQ using only 4.6 watts input.

Conditions were not too good up to the end of May (just before full moon), after which date they improved and DX from all continents came in on 14 mc.

VU2AB reports that during a very windy day, with occasional dust storms, he noticed the strength of X's and signals increased with a heavy squall and dropped to practically zero in between; also the note of the transmitter kept breaking off until the static *was discharged to earth from aerial.* The intervals between the squalls varied from ¾ to 10 minutes and the squalls varied from 3 to 8 minutes in duration.

Empire Calls Heard.

*BERS*195, *Eric W. Trebilcock, Moonta, South Australia* (*March* 10 *to April* 28, 1934) :—

7 *mc.*: ei8b (1), 9d (1), g2as (2), 2dl (1), 2du (1), 2ic (1), 2ig (3), 2mi (1), 2nm (4), 2qh (2), 2rf (1), 2yl (1), 2zq (1), 5cu (1), 5fn (1), 5fv (1), 5ht (4), 5ml (1), 5mu (1), 5nf (1), 5ni (1), 5nw (2), 5rs (1), 5uc (1), 5wq (1), 5yy (1), 6cj (3), 6in (3), 6ku (1), 6nj (2), 6nu (1), 6pf (1), 6rb (1), 6sv (1), 6uf (4), 6vp (4), 6vv (1), 6wn (1), gi5hv (1), 5mz (1), 5nj (1), su1ec (2), 1ch (7), 1sj (4), 3ab (1), 3eh (1), ve2ew (2), 2fq (3), 3kp (2), 3nn (1), 3qs (1), 4my (1), 4ro (1), 5fh (1), 5ha (1), 5hc (1), 5hi (1), 5iv (2), 5kb (2), 5kl (1), 9sj (1), vp2rm (1), 4ba (2), 4jr (1), 5pz (5), 9r (3), vq4kta (4), vs2af (4), 3ae (1), 6af (1), 6ak (1), 6an (1), 6aq (6), vu2dx (1), 2jb (1), 2jp (1), 2re (1), 7kh (1), yi7lc (1), 7rk (1).

14 *mc.*: g6if (1), 6vp (1), vp5pz (1), vu2ja (1), zl1ab (1), 1ap (2), 1ca (1), 1fe (2), 1gx (3), 2bz (2), 2ci (1), 2di (1), 2fh (2), 2fr (2), 2gq (1), 2ja (1), 2mr (2), 3cn (3), 3dj (1), 3dk (1), 3 fk (1), 4ao (1), 4bq (1), 4bt (1), 4bx (1).

(Figures in brackets denotes number of days in above period that each individual station was copied.)

(*Continued on page* 46)

EDITORIAL—(*Continued from page* 1)

pull together through the medium of R.E.S. the extension to our knowledge should be considerable. A year ago we pressed the need for co-operation, and we believe that this desirable feature has received attention. Isolated effort can lead nowhere, but when many hundreds of amateurs pool their experience and their knowledge tangible results are likely to be obtained.

Our 56 mc. Group Manager requires the utmost support for the Convention tests, and it is the duty of everyone, whether he be a transmitting or a receiving amateur, to see that he does not ask for help in vain.

WORKING AMERICA ON 1.7 M.C.—(*Continued from page* 17)

DX, for while 1932-33 gave fair results—and one Transoceanic contact—1933-34—has given excellent results and six contacts. Which is in keeping with the generally-accepted sunspot cycle theories. In addition, the tests have shed useful light on receiver and transmitter requirements for distance-work on 1.75 mc., while the novel antenna system used by G5WU opens up a whole field for new investigation.

It is not coincidence that the two amateurs to contact the States on 1.75 mc. should have both done so from district No. 10. Both G5WU and G6FO are men who take their amateur radio seriously —the only way it should be taken. Their success is proof that thoroughness has its reward. And the more there are like them, the better !

SOLILOQUIES—(*Continued from page* 18)

G6GZ, breezed in and told us all about them. After this, we regret to say, we wasted quite a lot of time dredging Frensham Ponds to see whether the South London stations had established themselves there. Our search proved fruitless (fruit is South London's trademark) and we returned to the No. 7 "B" station at the farm of Mr. Jones.

Here we saw some strange sights—G6SC among the pigs (you'll know him because he's wearing grey flannels)—G6CW chucking mallets about with murderous intent—G2CX and two others playing darts a la Grecian Goddess—G5LA dishing out new accumulators at prodigious speed (where *did* he get them charged ?).

A jolly week-end, except for those who had to do all the work on the Saturday. Now, if we had only found those two South London stations. . . .

G2ZC VISITS HEADQUARTERS—(*Continued from page* 43)

them commence their selfish tasks. On time the whole horrid gang appeared, and I was, to my surprise, shaken by the hand (when I expected my throat to be cut), and given a friendly word by each in turn. I did note our Honorary Treasurer eyeing me, and knowing that my subscription had been paid, I could only think that he did not like the tie I was wearing, or was he contemplating making me a Life Member, or was it merely surprise at seeing the most elusive member of the Society ? Anyway, I did not have the chance to get one back on him by telling him what a deuced fine Honorary Treasurer he has always been—perhaps as well, otherwise he might have touched me for a double subscription ! !

I saw a pile of work on the table, so made my stay short, but if you provincial members have an idea that Council do nothing, go and see for yourselves. I did not visit "53" again, but I made a telephone call the next day to enquire when the meeting finished, and as the time was given as 21.15 G.M.T., and as they had started at 18.00, I cannot help lifting my hat to Council.

Really, OM's, they do work for you and for me, and having seen, I believe, for I am too old a bird to spin a yarn that is not true. Team work seems the key-note right through " 53."

The only absentee seemed to be the Office Cat, and I had not time to ask if the office boasted one, but if so, one would be tempted to ask " Watts his name," for there are no Gay Dead men amongst the Pages of . . . (That's quite enough.—EDITOR.) . . . you're too Swift, OM. ; let me finish ! !

EMPIRE CALLS HEARD—(*Cont. from page* 45)

G6YL, Felton, Northumberland, during May and June :—

7 *mc. :* vp5is (4/3.4.9), vp9r (5.6.6), zs6a (3.4.9).

14 *mc. :* st1av (3.4/3.6), ve2hg (4.4.9), ve4ae (4.4.9), ve4ag (3.3.9), ve4jh (4.4.9), vp2rt (3.4.7), vp5pz (5/3.6/2.9), vp6zp (5.6.4), vq4crl (3.4.9), vs2af (3.4.6), vs6ax (3.3.9), vs7gj (5.6.9), vu2re (4.5.4), ze1jj (4/3.5/3.9), zs2a (4/3.4.9/8)

BRS822 63, Tennyson Road, Small Heath, Birmingham. April 18 to June 20 :—

3.5 mc. : ve1el.

7 mc. : ve1aq, 2dr, 3zo.

14 mc. : su1eg, 1ro, 3ab, 3eh, 5nk, 8kko, ve1au, 1bd, 1ci, 1fg, 1fw, 1gh, 2bb, 2bg, 2ca (fone), 2ee (fone), 2ew, 2fg, 2fq, 2fr, 3hf, 3je, 3kp, vp3b, 3d, 3v, vp5jb, 6zp.

Technical Articles are Wanted