THE T. & R. BULLETIN

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CONTENTS

1908-1938

WITHIN the pages of this issue appears, by courtesy of the Editor of *Nature*, a contribution entitled " Campbell Swinton and Television." Mr. Campbell Swinton, in addition to having been a virile leader in the amateur cause, was a visionary, for, as Dr. McGee points out in his article, it is to our venerated Founder-President that we owe the first conception of modern Cathode Ray Television. It seems incredible that, as long ago as 1908, Mr. Campbell Swinton should have written :—

" Indeed so far as the receiving apparatus is concerned the moving Kathode beam has only to be arranged to impinge on a sufficiently sensitive fluorescent screen, and given suitable variations in the intensity, to obtain the desired result."

Such a statement made only *five* years ago might have been regarded by most as sheer guesswork, but 29 years have elapsed since it first appeared.

Campbell Swinton set us an example which we should all do well to follow. With our field of activity concentrated largely upon the ultra-high frequencies we feel it *most* desirable that we should put on record every scrap of information which has been accumulated by experience.

Some of our readers will remember that in the early part of 1936, we appealed through this page for information relative to certain specific features of 56 Mc. work. By dint of hard work a report was prepared and submitted to the British Government. That report is to be published in sections in this Journal. Much of the information is already known to advanced workers on 56 Mc. problems, but (and this is important) no one has before attempted to place a summary before the Amateur fraternity as a consolidated whole. The publication of this information will enable members who are commencing 56 Mc. work to see what has been accomplished, thus avoiding some of the pitfalls which have beset those who have had earlier experience.

During last month Mr. D. W. Heightman (G6DH) and Mr. B. Groom (GM6RG) were informed that their 56 Mc. signals had been heard in the United States. We prophesy that before many more months have elapsed two-way Transatlantic communication will be established on these frequencies, and another milestone in Amateur history will have been reached or passed.

The need to continue our investigations in the direction of long-distance working on the U.H.F. was never more urgent than to-day. The International 56 Mc. Contest which we are sponsoring begins on January 1. May we look forward to new records being set up long before the New Year has run its course.

A 50-watt 56 Mc. C.C. Transmitter

By J. N. WALKER (G5JU) *

THAT it is desirable to use more modern gear than is at present in general use on the ultra-high frequencies goes without saying. For C.W. communication it is absolutely essential that some method of frequency control be incorporated in the transmitter, and, of the methods available, there is no doubt that crystal control is much to be preferred to any other. An AT cut crystal, used under suitable conditions, and in a properly designed circuit, will control the frequency within very close limits. Electron coupled oscillators take a long time to settle down to a working frequency, and it must be remembered that any drift in the fundamental on say, 3.5 Mc., is multiplied sixteen times in the final output, and consequently may be very serious.

Many amateurs have shied at using a c.c. transmitter on 56 Mc. believing that the difficulties to be overcome are great, and the final output not worth while. This may have been the case a year or two ago, but with the advent of much more efficient valves, these difficulties have been reduced to very small proportions.

For low power work the older types of both British and American valves are suitable, and there are now quite a number of low power c.c. transmitters in use in this country. The efficiencies obtained are somewhat low, and 4 watts output from 10 watts input is an average result.

The difficulties have lain in the necessity of obtaining a fairly large amount of drive to allow for various losses, and of finding output valves which will give a worth-while power gain on the ultra-high frequencies.

The Exciter Unit

The introduction of beam power tetrodes has solved the problem, and, whilst American 6L6 valves are used, it should be noted that several British equivalents are now available. Two 6L6's are used, the first being a tritet oscillator. A 7 Mc. crystal, with the second harmonic taken out in the anode circuit, is recommended, but the valve may be used as a quadrupler with a 3.5 Mc. crystal, as quite a high fourth harmonic output is obtainable. A small variable condenser is used to tune the cathode circuit, with a fixed condenser in parallel, to ensure that a low value of capacity is not used.

Parallel feeding the R.F. voltage to the doubler is poor practice, as the blocking condenser and choke are at high R.F. potential, and unnecessary as well as undesirable losses are introduced. To overcome this without any extra complications, a somewhat unusual method of coupling has been incorporated.

The C.O. anode coil consists of 8 turns 18 swg. slight spaced, on an *Eddystone* DL9 former. Half an inch or so below this winding is wound another, consisting of 12 turns 30 swg. close wound, connected to the doubler grid and cathode. Being aperiodic no tuning is required. It is to be noted that large dips in the oscillator anode current will not be obtained on tuning through resonance, as the following valve is always putting a load on the C.O.

The second 6L6 valve is always used as a doubler, in which service a large output is obtainable, whilst neutralisation is unnecessary. The anode coil consists of 5 turns 18 swg. on an *Eddystone* former, with two turns of the same wire wound on the "cold" (lower) side of the coil connected to the coupling link. Cathode Bias is incorporated in order to prevent damage to the valves should excitation fail. 6L6 valves, whilst rated at about 40 watts total input, have a very short life if the manufacturers' ratings are exceeded, if only for a brief period. Variable screen voltage enables ready control of the excitation, and it is seldom necessary for the *Varley* potentiometer to be at maximum.

The Editor and Headquarters Staff take this opportunity of wishing all members a Merry Christmas and a Happy New Year.

The Power Amplifier

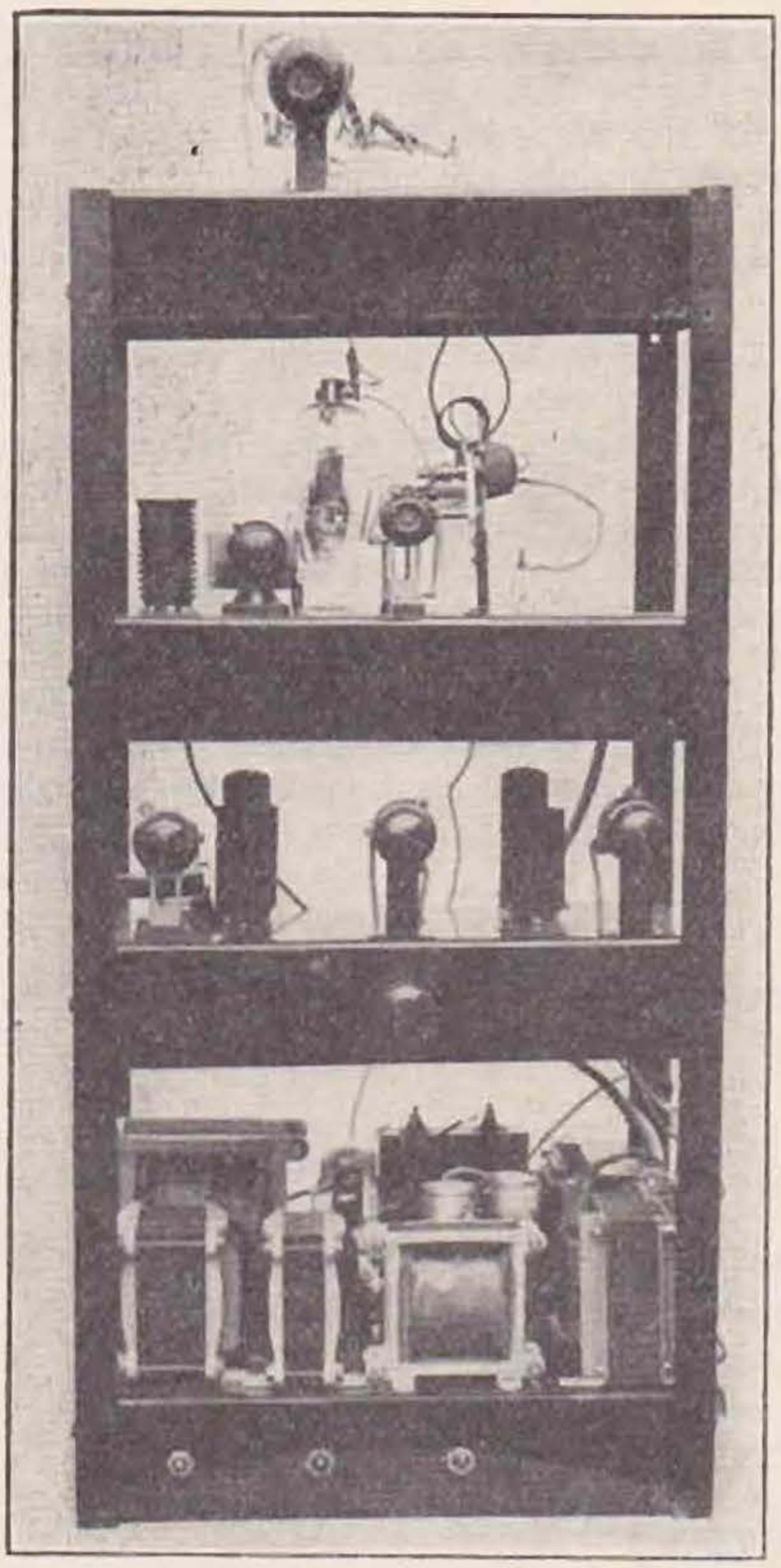
The efficiency (and efficacy) of the transmitter as a whole depends on the output stage. It would be of little use applying plenty of drive to unsuitable valves, and care must be exercised in their selection. One might think that the modern transmitting pentodes would prove efficient, but the input and output capacities are high, added to which is the fact that the anode circuit requires to be of high dynamic impedance, a condition very difficult to satisfy on frequencies of the order of 56 megacycles.

The most suitable valves were found to be low capacity triodes, and two *Taylor* type T20's are used. The grids are always in series, but clips are arranged in the anode circuit to enable either push-pull or push-push operation, the former for 28 Mc. and the latter for 56 Mc.

The tuning capacity in the grid circuit, which is tuned to 28 Mc., must not be too small (not less than 15 $\mu\mu F$) in order to prevent high peak R.F. voltages developing, and consequent overheating of the grids. The grid condenser is of the split stator type, in order to preserve balance, and so, also, is the anode tuning condenser. The capacity in the latter case should be very low, and 10 $\mu\mu F$ total, with a minimum of not more than 3 $\mu\mu F$ is desirable. In the transmitter two ceramic receiving 40 $\mu\mu F$ condensers were taken apart, a good deal of

*R.E.S. 56 Mc. Transmitter Design Manager.

the plates cut away, the whole reassembled with double spacing, and mounted with a coupling piece to form a split stator condenser capable of withstanding high peak voltages.



Front view of 50-watt 56-Mc. c.c. Transmitter with panels removed.

The tuning coils were made by *R.V. Inductances*, and consist of 3 turns 2½ ins. diameter 12 swg. enamelled, for the 56 Mc. tank, 7 turns being used for the 28 Mc. coil. Large stand-off insulators, with sockets which enable the coils to be plugged in and so quickly changed, keep the parts at high R.F. potential away from the metal work.

An unusual feature is the biassing arrangement. It was thought undesirable to have any external bias supplies, whilst no room was available to include a mains bias voltage supply. Bias is obtained partly from the grid leak, and also from R12 and R13, the cathode resistors. This latter prevents the current rising beyond rated limits when the excitation is removed. The anode current meter will always show a reading, despite the fact that the valves are run under Class C conditions.

Power Supply

This follows standard practice, a separate transformer being provided to keep all filaments heated independently. Choke input is used in both the high tension supplies, one of which gives 400 volts for the oscillator and doubler stages, .and one 600 volts for the power amplifier. To obtain these voltages transformers rated to give 500 and 750 volts respectively are required. A high degree of smoothing is provided in the high tension supply for the first stages, but to do the same with the higher voltage supply would increase the cost considerably and is not necessary. The single (swinging) choke and condenser are adequate, and reports invariably give the tone as T9X. The regulation is extremely good, and this factor contributes largely to the avoidance of key clicks and interference. Meters are provided to read the current to each stage, and a switched voltmeter for reading the voltage from either high tension supply.

Construction

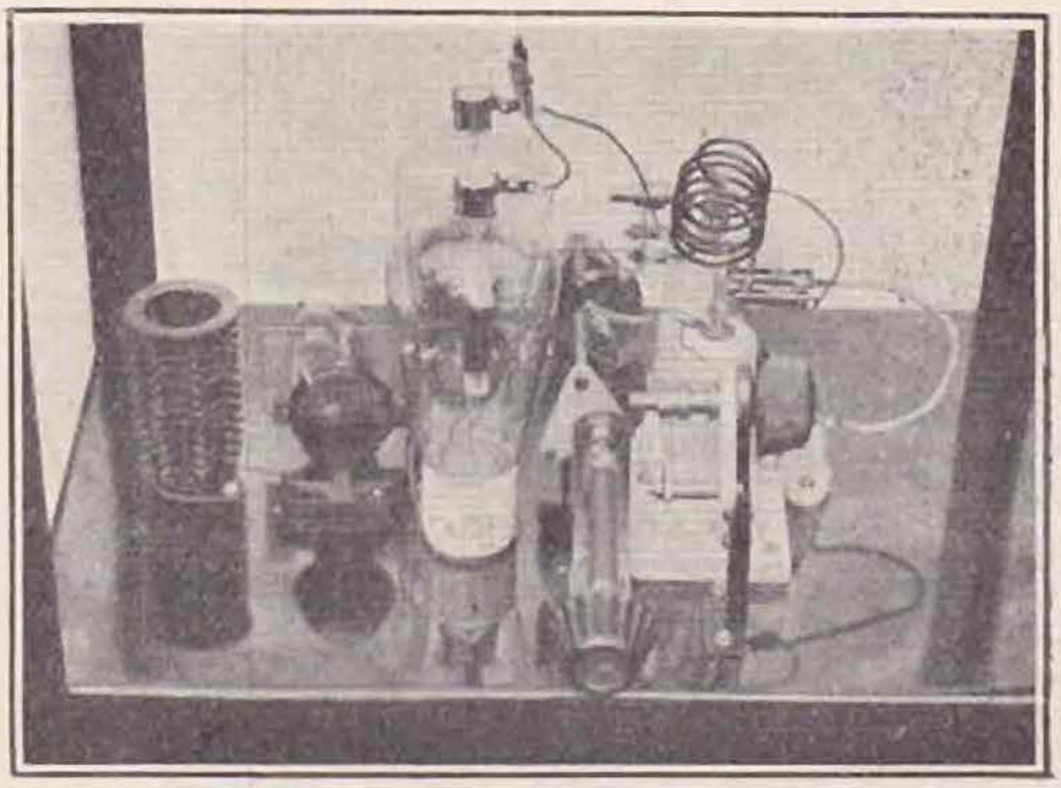
The transmitter is constructed on the rack-and-panel principle, four mild steel sub-bases, each measuring 14 ins. by 10 ins. by 2½ ins. being required, with suitable angle uprights, and a black crackle finished panel measuring 14½ ins by 36 ins. On this are mounted practically all the controls and the four meters.

The lower base holds the power supplies, therefore it seems appropriate to commence the constructional details at this stage. To get three transformers, three chokes, three valves, and three filter condensers on one base needs care in the layout, and the one adopted is shown in Fig. 3*a*.

It is desirable to cut a sheet of paper the exact size of the base and lay out the components on it; marking off all holes, including those necessary for running the leads through to the 866 (rectifier) valve, top caps, transformers, etc. Cutting holes, especially those over 1 in. diameter, in mild steel is hard work unless a power drill is available, and therefore the paper template should be sent away to the factory along with the order for the base. This procedure should be followed with the other sections thereby saving much time.

On the front of the base are mounted three switches. The first, a double pole one, ensures that when "off" the whole apparatus is entirely disconnected from the mains. Switches No. 2 and No. 3 are ineffective until No. 1 is in the "on" position, when also the filament transformer is energised. Switch 2 controls the 500 volt transformer, and switch 3 the 750 volt transformer. Note that when No. 1 is switched on both Nos. 2 and 3 should be "off," and also that they should not be switched on until at least one minute has elapsed, and longer if the transmitter has been idle for a week or more.

On the rear are mounted a flush type mains socket for connection to the power supplies, and a projecting socket, from which leads run to a switch on the operating table. With switches 2 and 3 "on," the table switch gives complete



Close-up view of P.A. push-push section of the 56 Mc. transmitter with dials and panels removed.

control, cutting off power to both the high tension transformers. A substantial earth terminal is also provided, together with fuses for the H.T. supplies.

Underneath the base there is, besides the wiring, only the condenser C23. This is of the dual type, with the common tag earthed, and is used to prevent R.F. getting back into the mains.

A "*Clix*" fused mains plug, fitted with 2 amp. fuses, protects the equipment as a whole.

The Exciter Unit Construction

This occupies the next sub-base up, and plenty of room is available, so that the two stages can be well spaced from each other. The layout is shown in Fig. 3*b*. It is not necessary to follow this exactly, but remember that the leads between C3 and L3 must be kept short, as this circuit is tuned to 28 Mc. The inductance in the Tritet Cathode circuit is not shown because, in the actual transmitter, it is a coil of 6 turns 1½ ins. diameter wired-in permanently underneath the base. Should it be intended to use 3.5 Mc. crystals some form of coil mount must be arranged on top, to allow of a coil of 10 turns 2 ins. diameter being plugged in.

The *Varley* potentiometer is mounted centrally on the front of the base, and sufficient metal must be cut away from around the spindle to prevent any possibility of a short circuit, as the spindle is "alive." On the rear is mounted a *Bulgin* closed circuit jack into which the key is plugged when it is desired to use C.W. This jack must be well insulated from the chassis.

C1, 2 and 3 are mounted on *Eddystone* brackets, fitted as close to the edge as possible. The coil holders are of the chassis mounting type, and practically all connections are sub-chassis.

The 60 mA. fuse bulb should be placed where it can easily be seen, as a watchful eye on it is necessary when tuning up.

Condenser C.19 is of the ceramic cup type, these now being available from either *Dubilier* or *T.C.C.* They have lower losses than mica, but equally important is the fact that their capacity remains remarkably constant under all conditions. C.9 and 14 are of the 500 volt working type, as the 350 volt type used in all the other positions will not stand up to the high R.F. plus D.C. voltage across them.

Nearly all the small components are held in the wiring; No. 18 swg. tinned wire being used, thus ensuring that everything is kept fairly rigid. Note that one side of each valve heater is connected

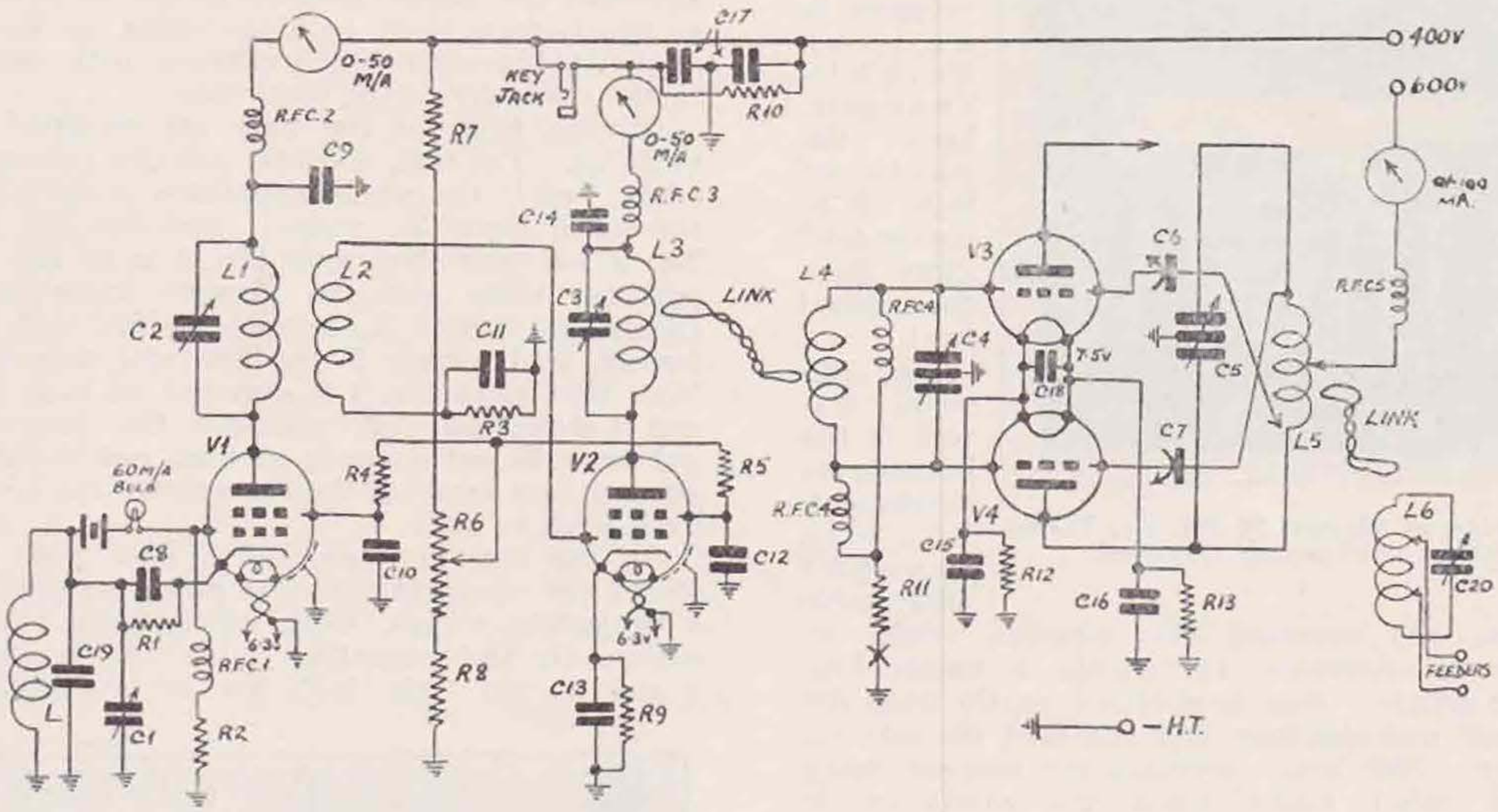


Fig. 1.
Circuit of 56 Mc. Transmitter.

C1.—100 μμF, type 900-100, Eddystone.
C2, 20.—40 μμF, type 900-40, Eddystone.
C3.—20 μμF, type 900-20, Eddystone.
C4.—45 by 45 μμF, twin midget, J.B.
C5.—50 by 50 μμF, type 1081, Eddystone.
C6, 7.—15 μμF "Apex" Webbs.
C8, 10, 12, 13.—.001 μF, type M, T.C.C.
C11.—.0002 μF, type M, T.C.C.
C15, 16, 18.—.0005 μF, type M, T.C.C.
C9, 14.—.0005 μF, type 340.
C19.—100 μμF ceramic cup type, T.C.C. or Dubilier.
R1, 9.—400 ohms, 1 watt, type F, Dubilier.
R2.—40,000 ohms, 1 watt, type F, Dubilier.
R3.—100,000 ohms, 1 watt, type F, Dubilier.
R4, 5.—5,000 ohms, 1 watt, type F, Dubilier.
R12, 13.—200 ohms, 1 watt, type F, Dubilier.
R11.—6,000 ohms, 3 watts, type F, Dubilier.
R6.—30,000 ohms, type CP65, potentiometer, Varley.
R7, 8.—5,000 ohms, 10 watt, type CP41, Varley.
R10.—1,000 ohms, 5 watt, type AR1K, Bulgin.
RFC1, 2, 3, 4, 5.—type 1010, Eddystone.
RFC6.—Type 1022, Eddystone.
3 Dials, type 1027, Eddystone.
3 Dials, type 1026, Eddystone.
6 Brackets (adjustable), type 1007, Eddystone.
2 Extension Controls, type 1008, Eddystone.
1 Crystal and Holder, Q.C.C.
3 Coil Formers, type 936, Eddystone.
3 Coil bases, type 1073, Eddystone.
3 Meters, 0-50 mA., Ferranti.
0-50 mA., Ferranti.
0-100 mA., Ferranti.
1 Jack (and Insulating Brushes), type J6, Bulgin.
Valves, V1 and 2, 6L6 Metal, Eves Radio.
V3 and 4, T20 Metal, Eves Radio.
Valveholders, Amphenol ceramic, Eves Radio.
Stand-off Insulators, 2 type SX (with plug and sockets),
Stand-off Insulators, 2 type SL (with plug and sockets),
Stand-off Insulators, 4 type SS (with plug and sockets),
Radiomart.

direct to the chassis. This eliminates the necessity of condensers to prevent modulation hum, whilst only one lead need be taken to the filament transformer.

Coils L1 and L2 are wound on one former, as previously mentioned, and L3 and the link winding on another. It has been found advisable to use two turns for the link winding.

The Power Amplifier

An effort must be made with this section to keep all leads absolutely as short as is possible. The main difficulty will probably be to find room for the neutralising condensers in a position where leads will be short. The best place for them is right up against the stand-off insulators, as shown in the diagram Fig. 3*c*. The grid tuning condenser C4 is a *J.B.* Twin Midget, this being very suitable by reason of its small physical dimensions. It may be mounted on a *Bulgin* metal bracket, although an insulated one is preferable, in order that all earth returns may be taken to one common point on the chassis. The mounting of C5 will depend on the type of condenser used. If two receiving types are made to suit, as previously mentioned, then a bracket at each end will be required. If, however, the *Eddystone* type 1081 is used, mounting lugs are provided on the condenser. This model will prove quite suitable, but the minimum capacity may necessitate making the tank coils rather smaller.

C6 and C7, the neutralising condensers, must of course, be on insulated brackets. The capacity of these condensers, as purchased, is too great, and it is necessary to reduce it by taking apart and rebuilding, leaving only one vane on the spindle. Two fixed vanes are fitted, with triple spacing, the result being a condenser of 5 $\mu\mu F$ maximum capacity, capable of withstanding, without breaking down, the high voltages across it. C18 is connected across the filament leads, close to the valves, and C15 and C16 taken from each side of C18, the other ends being connected to the chassis at the point where one of the brackets holding C5 comes through.

Note that the centre tap (if provided) of the 7.5 volt winding on the filament transformer must not

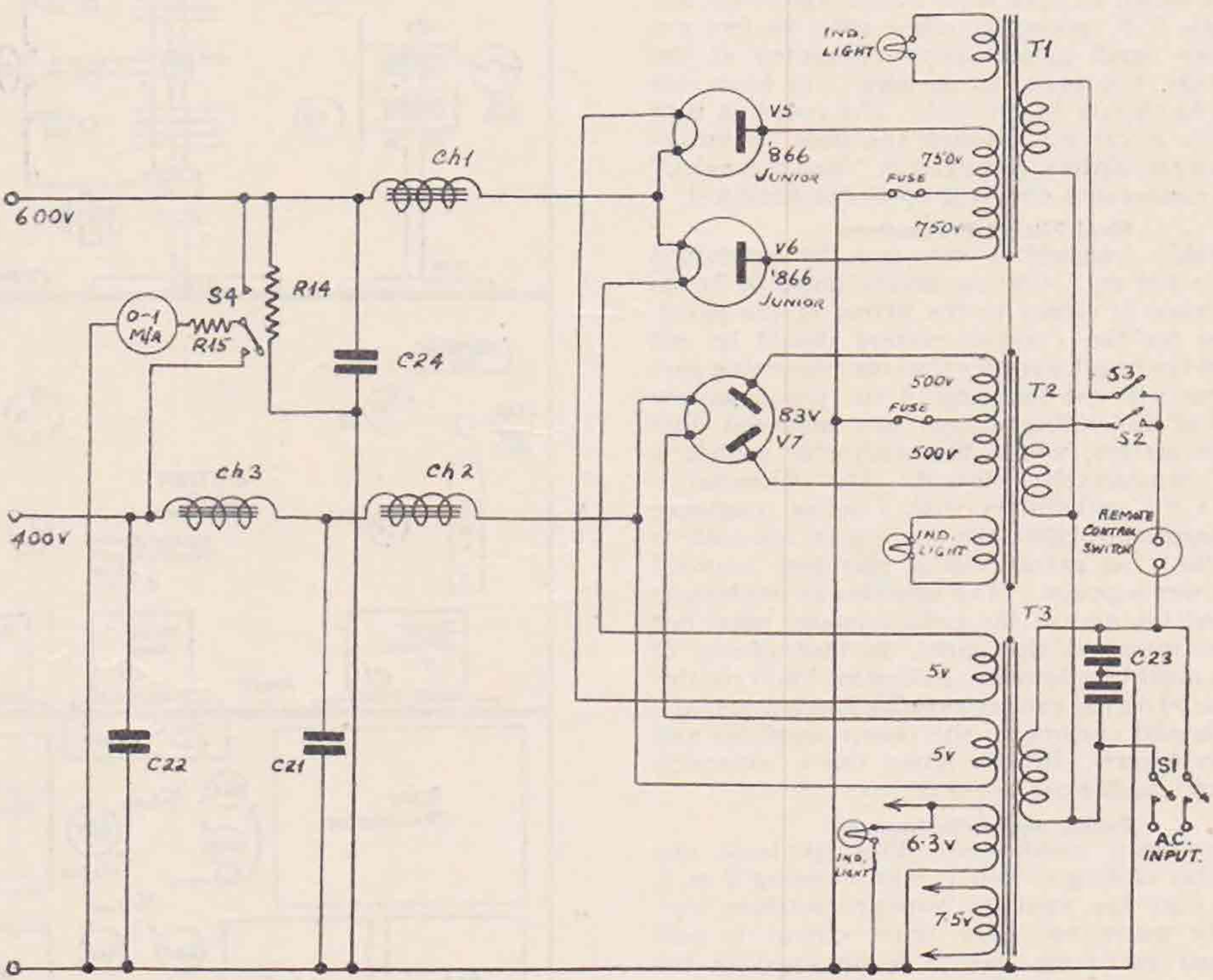


Fig. 2.

Power Supplies.

T1.—750-0-750 volts, 150-200 mA. 4 volts for ind. light.
T2.—500-0-500 volts, 120 mA. 4 volts for ind. light.
T3.—6.3v. 2a, 7.5v. 4a, 5v. 3a, 5v. 3a.
Ch.1.—5-25 henry swinging choke, 200 mA.
Ch2.—5-25 henry swinging choke, 120 mA.
Ch.3.—20 henry smoothing choke, 150 mA.
C21, 22.—8 μF, 500-volt wkg., electrolytic, type 0281, Dubilier.
C23.—.01 by .01 μF 300-volt A.C. working, type 87A-02, T.C.C.
C24.—4 μF 1,000v. working, type 111, T.C.C.
R14.—50,000 ohm, 40 watt, type PR41, Bulgin.
R15.—1 Megohm, 1 watt, type F, Dubilier.
S1.—D.P.S.T., type S88, Bulgin.
S2, 3.—S.P.S.T., type S80, Bulgin.
S4.—S.P.D.T., type S92, Bulgin
3 Indicating lights, type 19, 34, 38.
Meter, 0-1 milliamps, Ferranti.
Valves, V5, 6, 866 Junior, V7, 83v. ,Webbs.
Power sockets, fused input plug, Clix.
H.T. Fuses, types 1034, with 250 mA. and 150 mA. Fuses, Belling Lee.

be used, otherwise R12 and R13 will be short-circuited. L4 is similar to L3, and is wound on a four-pin former, with two turns again for coupling to the link.

Two R.F. chokes are used in order to avoid the use of a centre tap on L4, and the necessity of a six-pin coil and holder.

A small stand-off insulator carries the H.T. feed through the base, a heavy duty choke being connected immediately below.

On the rear of the base is mounted a 3-amp. socket, to which the output from a modulator can be connected when it is desired to use telephony. A switch alongside allows of this being shorted for C.W.

Aerial Coupling Unit

This is a simple affair, arranged on the top deck (Fig. 3*d*). The coil, made by *R.V. Inductances*, consisting of 5 turns 1½ ins. diameter for 56 Mc., and 7 turns 2 ins. diameter for 28 Mc., is mounted on two beehive stand-off insulators and tuned by an *Eddystone* 40 $\mu\mu F$ condenser, preferably of the old type (without Calit insulation), as this has a lower minimum capacity. An extension handle should be fitted, as both sides of the condenser will be at high R.F. potential when twin feeders are used. Two small insulators are mounted at the rear to take the aerial or feeders, and leads are arranged to clip on to the coil. The coupling turn of one link is carried through the base by means of four more insulators, arranged as " lead throughs," one turn underneath coupling up to the tank coil.

Final Fitting Precautions

The whole transmitter can now be assembled and connected up. Certain points must be borne in mind when it comes to the fitting of the panel. The holes for the *Ferranti* meters should be cut well up on the panel, in order that the projecting part at the rear will not foul any of the power supply parts. The indicating lamps are mounted just below the meters, whilst the voltmeter switch is mounted immediately below it. The voltmeter is actually a 0.1 milliameter with a series resistance of one megohm, so that the reading at full scale is 1,000 volts. No extra load is therefore imposed on the power supplies. The spindles of condensers C1, C2 and C3, and of the potentiometer must not touch the metal of the panel, so that plenty of clearance must be allowed. *Eddystone* knob pointer dials are used on the exciter variable condensers, and knob dials and cursors on the power amplifier and aerial condensers. In the latter cases, extension handles and bushes are required.

Tuning and Adjustments

As previously mentioned, allow at least one minute after closing switch 1 before closing 2 or 3, in order that the mercury vapour rectifiers may thoroughly warm up. The tritet circuit is now tuned until maximum output is obtained in the anode circuit, C1 being near maximum capacity, and C2 near minimum. The fuse bulb will probably light up, and the final adjustment must be such that only a tiny glow, and preferably none, is visible. The potentiometer should be at minimum position, when the first meter will read about 40 milliamps. A dip on resonance, although not pronounced, will be obtained. C3 should now be rotated, and at near minimum capacity, resonance will be indicated by a dip in the anode current shown by the second meter. A high output on 28 Mc. should be obtained, a neon lamp held against C3 striking brilliantly. This output is transferred to the P.A. stage *via* the link, which may conveniently be made of two lengths of 18 swg. enamelled wire threaded through

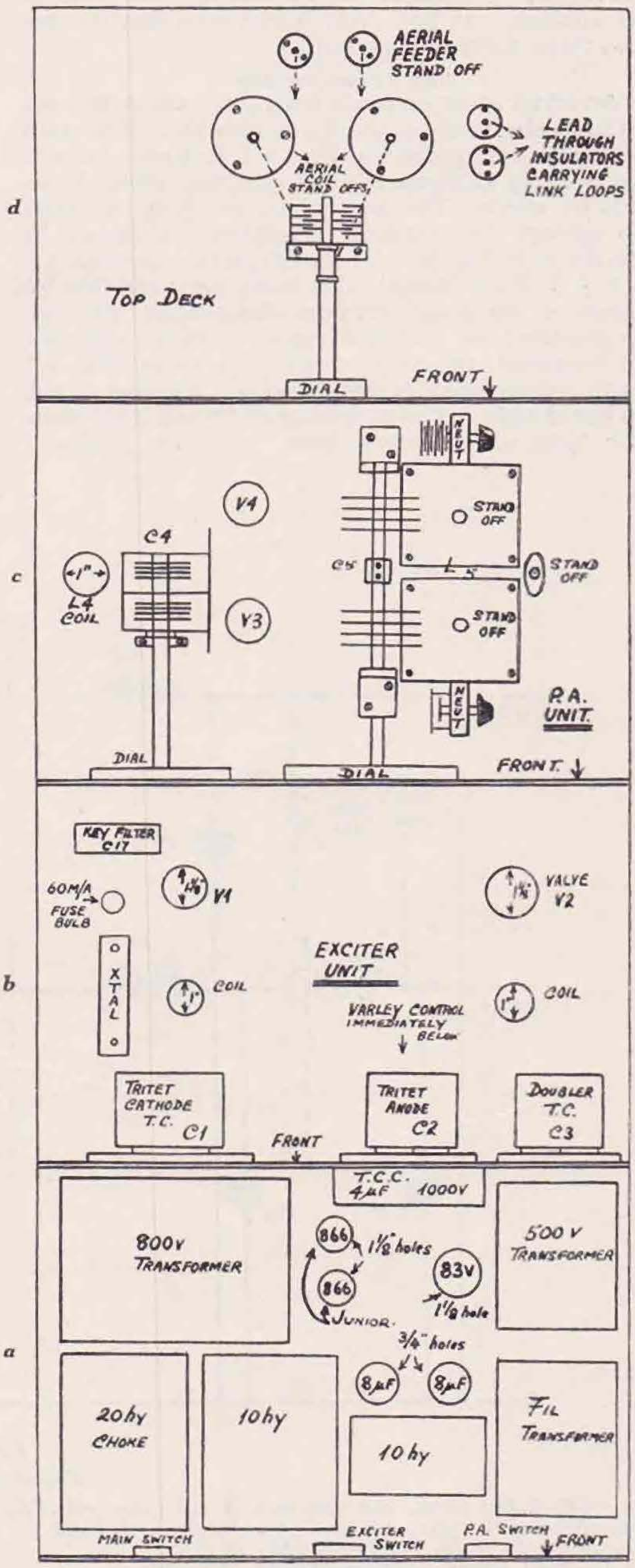
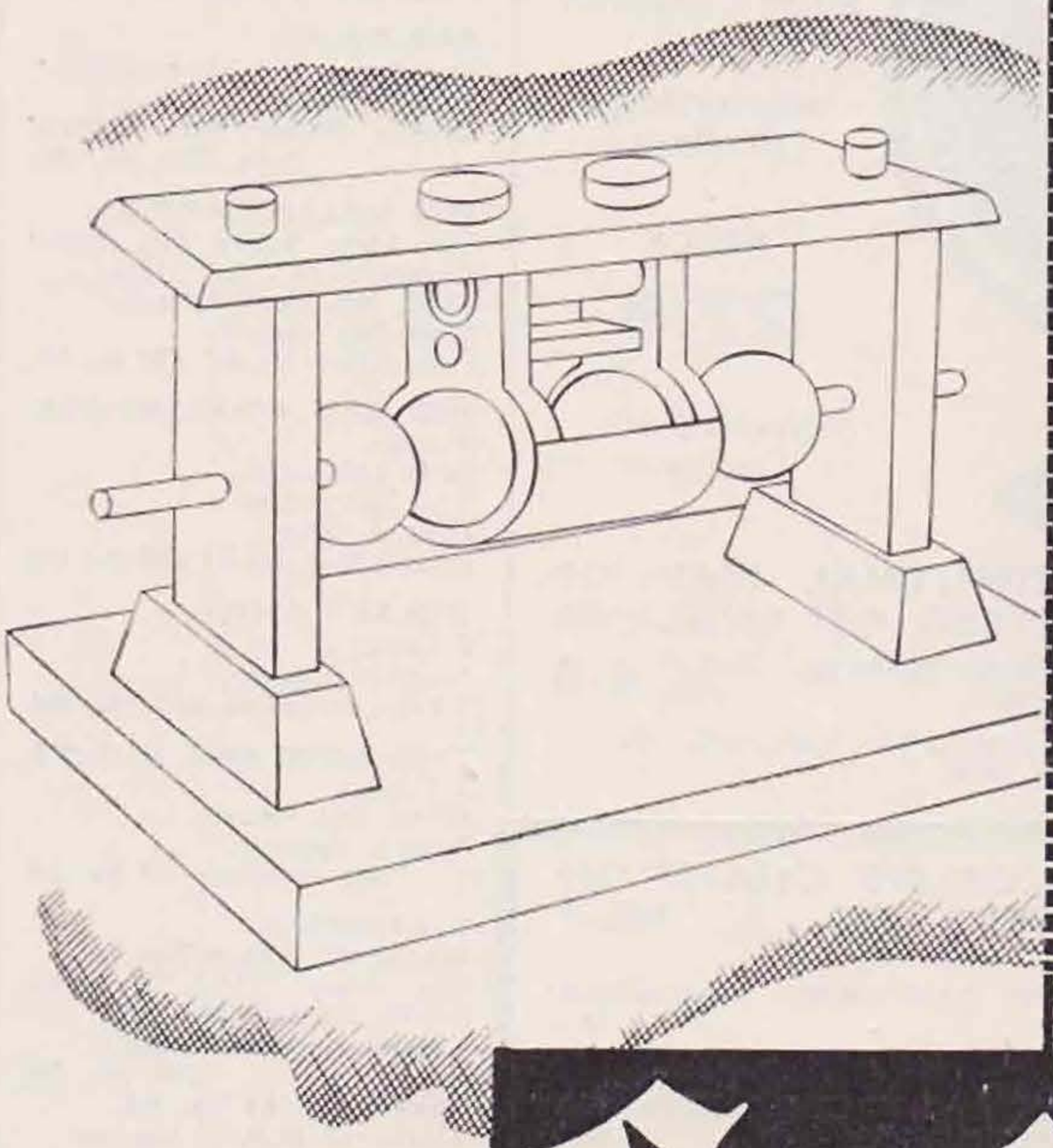
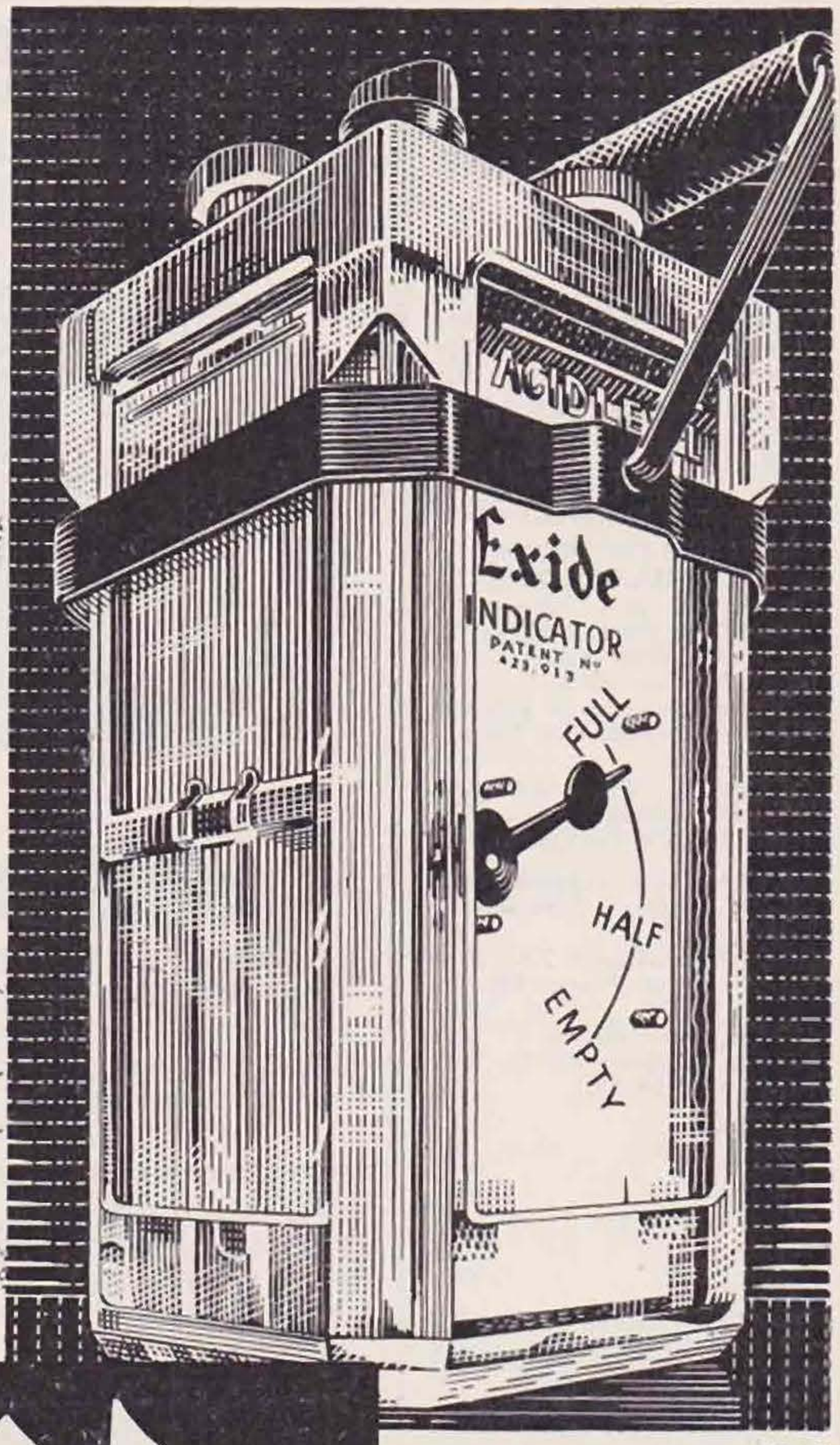


Fig. 3.
Layout Sketches of the four Sub-Bases.
(a) The power supply unit.
(b) The exciter unit.
(c) The power amplifier unit.
(d) The aerial coupling unit.

OIL-IMMERSED OSCILLATOR

This oscillator was used by Marconi in his first demonstrations in England. It was about this time that the Chloride Company first made batteries. The oil-immersed oscillator has gone but the Exide Battery — made by the Chloride Company — maintains its predominant position.





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Exide

BATTERIES FOR RADIO

'Still keep going when the rest have stopped'

• *For dry batteries ask for* **Drydex**

Obtainable from any reputable dealer or Exide Service Station.

The Chloride Electrical Storage Co. Ltd. (Exide and Drydex Batteries), Exide Works, Clifton Junction, near Manchester. Also at London, Manchester, Birmingham, Bristol, Glasgow and Belfast

the same piece of systoflex sleeving. Ordinary flex is unsuitable at these high frequencies.

We now come to the adjustment of the power amplifier, taking 28 Mc. operation first. The lead to the anode of V3 is fitted with a clip, and this is attached to the nearest end of the coil. The other anode is permanently connected to the other side of the coil. Similarly the lead from C6 is clipped to the further insulator, C7 being permanently connected. The valves are now arranged as a push-pull straight amplifier, and neutralisation is necessary. This is accomplished by tuning the grid circuit to accept energy from the exciter, holding a lamp and bulb against the tank coil, and varying C6 and C7 (keeping them approximately equal), until no light can be obtained on rotating C5 through resonance. No H.T. is applied to V3 or 4 (i.e., switch 3 is "off") until these adjustments have been satisfactorily concluded. The actual value of neutralising capacity required is around 3 $\mu\mu$F, and, with the condensers cut down according to previously given instructions, complete neutralisation should be effected without difficulty when the condensers are nearly "all in." Switch 3 may now be closed, but make sure that the setting of R6 is still at or near minimum. A high reading will be shown on the milliammeter, dropping to a low value (20 mA or less) on rotating C5.

Before dealing with aerial circuit adjustment, we will first consider 56 Mc. operation. The anode lead from V3 is clipped directly on to the top of V4—not to the end of L5. This is important, as the only time parasitic oscillations were found, was with this latter connection. The two leads from the valves to a common mid-point (the end of the coil) produced an oscillatory circuit of extremely high frequency—probably in the region of 300 Mc—whilst the R.F. output at this frequency was amazing!

The clip from C6 is joined to the same end of the coil as C7, so that both anodes and both neutralising condensers are now in parallel. No further adjustment of C6 and 7 is required. The smaller tank coil is plugged in, and resonance will be found with C5 practically at zero. The push-push type of doubler gives twice the output of a single valve, and by the use of two high efficiency triodes, especially suited for U.H.F. work, an output up to 30 watts is available on 56 Mc.

Aerial Adjustments

The following notes apply to both 28 and 56 Mc. operation :—

Aerial adjustments will naturally depend upon the type of aerial used. When a centre-fed half-wave dipole is preferred, with 72 or 80 ohms feeder, all that is necessary is to bring the ends of these to the top terminals of the lead-through insulators, and arrange a single turn (well insulated) from the bottom terminals to couple into the middle of the tank coil. It will be found that the aerial takes the feed very easily, and tight coupling will not be necessary. If it is found otherwise attention should be paid to the aerial itself, to ensure it has been cut to the correct length. It is to be noted that no R.F. should be shown on the feeder, indicated by the striking of a neon lamp. If this happens, earth the centre point of the coupling loop.

If 600 ohm matched impedance feeders are in use it is possible to couple these direct to the tank oil also; in this case two turns instead of one, form a fairly good match. Here also it is permissible to earth the centre of the two turns, this tending to preserve a better balance.

For other types of aerial the aerial tuning unit on top is brought into action. One turn below, and one turn above the insulators will serve to couple the two circuits, and experiments with the size and spacing are desirable in order to secure the maximum transfer of energy. If twin feeders are used, connect them each side of the centre tap, which should be earthed to the metal work. With a Windom feeder or an end-on aerial, earth one end of the coil and tap on one or two turns from this end. When one end of the coil is earthed arrange the link loop at that end, but when the centre is earthed arrange the loop centrally. The lower link loop should always be central to the tank coil. The excitation may be increased by turning R6 towards maximum when the aerial is taking a load. It should not be done earlier, as, due to the very high L/C ratio employed in the tank circuit, high R.F. voltages may cause a flash-over.

When making adjustments be careful not to couple one circuit to the driving circuit so tightly that the R.F. in the latter is "killed." Doing so causes a band pass effect, makes tuning broad, increases the valve dissipation, and the power transferred is lower than it should be. Coupling slightly sub-optimum is preferable, this condition being indicated by sharp tuning in both of the coupled circuits.

Keying

Little has so far been said about keying, beyond the fact that, due to the good voltage regulation, key clicks are negligible. A key filter is incorporated across the key, the final result being an extremely clean note. Notice particularly that a fairly heavy duty resistance is specified for R.10, this being necessary because the charge (400 volts) across C17 is dissipated in this resistance every time the key contacts close. Keying was at first accomplished by breaking the feed to the screen of the second 6L6. This was fairly satisfactory, but a spacer was reported. It was discovered that the 6L6, although only passing 3 mA still produced sufficient R.F. (unmeasurable) to drive the T20's to several watts input. Putting a small negative bias on the screen grid of the 6L6, when the key was up, made little difference, due probably to the absence of a suppressor grid. The keying was therefore transferred to the H.T. positive, cutting off all high voltage to the valve when the key is up, and this completely cured the trouble. The cathode circuit may be keyed if preferred.

A transmitter of this type is very fascinating to handle, whilst, at the same time, the results are extremely satisfactory. When more like it are radiating, 56 Mc. pure C.W. signals to definite schedules there will be a very much greater probability of DX contacts occurring on this band. During the coming year, when it it expected that the eleven year cycle will reach its peak, the conditious will be more favourable than they have ever been as far as amateurs are concerned. Get busy, build this transmitter and use it on 56 Mc. as often as possible.

* * * * *

Realising that neither of the two alternatives specified for the power amplifier tank circuit were

(*Continued on page* 347.)

Typical 56 Mc. Experimental Gear

By L. G. Blundell (G5LB) and E. H. Swain (G2HG).

FROM correspondence and personal contacts with amateurs it appears obvious that many people are under the impression that the fairly long-distance work on 56 Mc., which has been mentioned from time to time in the T. & R. Bulletin is carried out by stations having a remarkably good and high QRA, complex gear, and that directional aerial arrays are practically essential.

In order to dispel this idea it has been suggested by the Editor that a brief description of several typical 56 Mc. stations should be published.

G2KI. Situated at St. Margaret's-on-Thames, Middlesex. The transmitter usually works on 56,120 kc., and consists of CO (PM5X), Doubler (6L6), Doubler TZ05/20, Doubler (6L6) and PA (Ampx. 800). The input to the last stage is about 50 watts. After many trials with various aerials, the best all-round performance has been secured with a 66-ft. horizontal end on Hertz. The receiver is a battery operated auto-dyne, using an electron-coupled detector circuit (6C6) transformer coupled to the L.F. stage (76).

G2LC. Situated at Leigh-on-Sea, Essex, about 150 feet above sea level.

The transmitter is of the simplest construction, but for all that it turns out a very nice CW signal which has been heard up to 66 miles away. It consists of an RK34, used as a push-pull oscillator feeding-plate and grid lines. The input is about 9 watts. The aerial has a 68-ft. top, Zepp. fed, and about 45 ft. high. The transmitter is coupled to the aerial with a Collins coupler. The receiver is a 1—v—1, and has been built entirely to specification from the latest "*Guide to Amateur Radio.*"

G6DH. Situated at Great Clacton, Essex, in flat country with no screening in any direction except a few trees.

Another simple transmitter is used at this station, and consists of a self-excited single-ended long-line transmitter, similar to the one described in *The Radio Amateur's Handbook*, and puts out a very stable CW signal. The maximum input is 100 watts to an *Ediswan* ESW 501. G6DH is at present experimenting with a third rod in the filament circuit, and this promises greater efficiency. A crystal controlled transmitter is also available using an RK34 7 Mc. CO and 14 Mc. doubler, RK34 28 Mc. doubler, and an Eimac 50 T as a power doubler to 56 Mc.

The receiver is 1—v—1, battery operated, and was described in *Wireless World* for May 7.

The aerials used are a 66-ft. end-on Hertz, or an H-type beam.

G6FL. Situated at Longstanton, Cambs.

A crystal controlled transmitter, using a 59 as a tritet with a 7 Mc. crystal, followed by a 6L6G regenerative doubler to 28 Mc. Another 6L6G, with series tuned plate circuit then doubles to 56 Mc., and drives an Eimac 35T in the final. Input 25 watts.

The aerial consists of two half-waves in phase with reflectors fed by a 600 ohm. line. The aerial is directed 5 degrees west of South.

The receiver is 0—v—1 battery operated, using a HL2K as detector, transformer coupled to triode output.

G8JV. Situated at West Bridgford, Notts.

Crystal control is used at this station from a 3.5 Mc. crystal. The sequence is 89 tritet, 6L6 quadrupler, and a T20 power doubler, with an input of about 20 watts. The aerial is vertical half-wave, about 60-ft. high, fed by low impedance feeder. The receiver uses a 954 Acorn R.F. stage, capacity coupled to a 6K7 detector.

G5LB. Situated at Anerley, London, with a very usual type of QRA, has a useful "service" area, with the following gear:—

7 Mc. triode CO with second harmonic output and two doublers. The valves used are CO/FD, a 362 P625, first FD, a PM256, and the final (power) doubler, a TZ05/20 with 25 watts input. Receiver is an ordinary Reinartz battery operated. Aerial, 5/2 waves at 18 ft.

G2HG. Situated at Sydenham, in South-East London.

The station is low lying, and is badly screened by near-by hills to the west and south-west. The transmitter consists of an RFP15 as a tritet, using a 7 Mc. crystal, a TZ05/20 doubler to 28 Mc., a TZ05/20 regenerative doubler to 56 Mc., and a P.A., using a Taylor T55. The input is 40 watts. Numerous aerials have been tried, but for general work an eight half-wave end-fed Hertz has been found ideal.

The receiver is an 0—v—1, using the Reinartz circuit, and consists of a PM1HL as detector, choke coupled to a pentode output.

In addition to the types of transmitter mentioned above, there are even simpler arrangements which, with a little care in design, can produce a very useful CW signal. We refer to those popular circuits under the heading of Colpitts, Ultraudion and the TPTG. All of these can be used with success, and as an instance we give details of results obtained during tests at G5LB with the last two mentioned circuits.

Ultraudion. 7 watts to a 362 P625 with A.C. on the filament. Average tone report—T7, QRK up to S7 at 25 miles. No trace of drift.

TPTG. 8 watts to same valve with same filament supply. Tone reports—Average T5, but this with whole of grid coil in grid-filament circuit. Improved to T6—7 by tapping grid down a turn or two. Similar QRK's obtained as with the Ultraudion.

The same aerial system was in service during these tests as is now used with the CC transmitter, but it was found that with a little care in adjustment, a fair degree of coupling could be used.

Look at Your Log.

On November 30, G5UM and G5US noticed a pronounced echo on all 3.5 Mc. signals which made them sound like W6 or similar DX signals.

A check on the 14 Mc. band revealed an almost entire absence of signals. What was the experience of other amateurs on this evening ?

C.W. on a Super-regenerative Receiver

By L. E. Newnham, B.Sc. (G6NZ).

IT does not seem at all generally known that a super-regenerative or quench type receiver can, in certain circumstances, be used for the reception of pure C.W. By reception is meant the formation of a beat note in the telephones as in the usual reception of C.W. on a straight receiver.

In order to achieve such reception there must be careful control, first of the amplitude of the quench oscillations and, secondly, of the amplitude of the detector oscillations. This calls for a separate quench valve with which most "home service" ultra-short-wave receivers are already equipped. All such receivers are provided with a control for detector oscillation. Usually on such sets, however, when the control is turned to receive a signal, there is a great deal of mush noise, which tends to obliterate weak signals and renders the receiver capable of responding only to modulated waves.

Several methods of controlling the amplitude of injected quench oscillations have been tried, *e.g.*, loose coupling by coils, control of H.T. to quench valve, and resistance damping across one quench coil. The best method tried, and probably the simplest, was to isolate the quench oscillator (which need not be screened) and introduce the oscillation into the detector anode circuit through a variable resistance and a fixed condenser. Values found suitable are given in the diagram. The usual type of quench receiver can easily be altered to this arrangement. The variable resistance now affords complete control of quench oscillation amplitude.

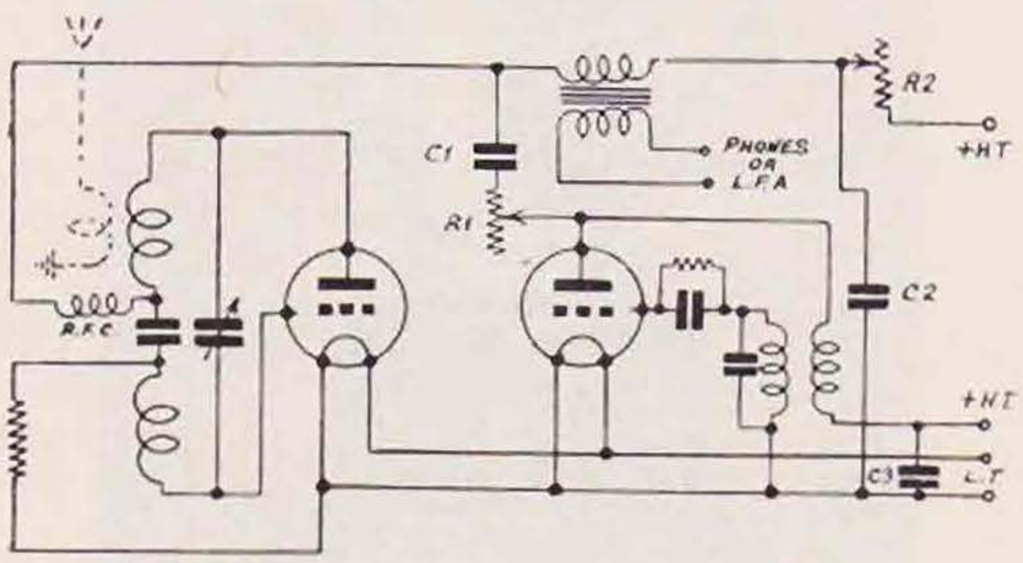
With this control at maximum resistance, the receiver functions as a 0-v-1 and receives normal C.W. Having tuned in a weak C.W. signal gradually introduce a little quench. A point will be found where the strength of the C.W. beat note is increased. It may be necessary, at the same time, to readjust the detector control also, usually by "backing off," as these oscillations must not be too strong either.

If the tuning be now altered, it will be found that there is a main signal and a number of subsidiary chirps on each side of the main tune point. In this condition the quench receiver is giving a beat note response to the C.W. signal, and, what is more, finding a signal is made easier by reason of the wide frequency range of the series of "chirps."

If the quench be increased still more, the beat note will disappear, leaving only the modulation, if any, and the receiver now begins to show the familiar rustling noise as in the usual method of operation for the reception of 'phone and tone.

Since each signal gives rise to quite a family of chirps extending for several degrees on the tuning dial, the receiver is somewhat unselective, as overlapping may occur if many stations are transmitting. Under the present conditions on 56 Mc. this does not seem a great disadvantage, and the method is recommended for trial, if only to confute the idea that a super-regenerative receiver cannot receive pure C.W. In addition, the quench control is of definite value when receiving weak 'phone as the mush level can be reduced. Many receivers which have been heard have suffered from too powerful a quench, giving rise to excessive noise.

Those interested in the theory of quench C.W. reception should read page 733 of the *Admiralty Handbook* (1931), where "stroboscopic reception" is discussed.



Quench Receiver.

Quench control *C1.—.0005 μF.*
R1.—100,000 ohms, variable.
Detector control *R2.—50,000 ohms, variable.*
C2.—2 μF.
C3.—.1 μF.

Other values normal.

Transatlantic Tests

Acting on suggestions from the States, arrangements are being made to run a series of 56 Mc. Transatlantic Tests on Saturdays and Sundays from January 15 to February 27.

The agreed schedules are as follows:

G stations will transmit from 1500-1515 G.M.T. and again from 1530-1545 G.M.T.

W stations will transmit from 1515-1530 G.M.T. and again from 1545-1600 G.M.T.

It is believed that during the above period, the F_2 layer will be favourable for ultra-high frequency work.

Reports should be sent direct to either Mr. L. H. Blundell, G5LB, or Mr. E. H. Swain, G2HG.

ON4AU on 56 Mc.

Mr. J. Mahieu, ON4AU, informs us that he will work on 56,080 kc. at the following scheduled periods:—

Wednesdays:	20.30	to	23.00	G.M.T.
Saturdays:	10.00	,,	12.00	,,
	14.00	,,	16.00	,,
	20.30	,,	24.00	,,
Sundays:	09.00	,,	11.00	,,
	13.30	,,	15.00	,,
	21.00	,,	23.00	,,

Transmissions will be crystal controlled C.W. with occasional telephony. He will be using an input of 300 watts to a pair of WE 304B's.

ON4DJ located at Knocke-on-Sea will also be on the air at the above times.

Polystyrol Resins for Ultra-High Frequencies

By D. W. Heightman (G6DH) and G. F. Bloomfield, Ph.D.

RATHER more than a hundred years ago Borastre obtained from storax a liquid which showed a remarkable tendency to turn into a solid resinous substance on keeping; the liquid was named styrene from its origin. About thirty years later, Berthelot succeeded in obtaining it artificially. Up to a few years ago the matter remained of academic interest only, until the growing economic importance of plastics and the search for new resins of improved properties brought it again into the limelight. So promising have its properties been found to be, that in both Germany and America large-scale methods have been developed for the production of styrene and from it the resinous substance called polystyrol—better known as trolitul (the German product) or victron (the American product).

Styrene is a water clear liquid simply made from another liquid (ethylbenzene) closely related to ordinary benzine from which it can be obtained. When styrene is heated, preferably with a trace of activating substance such as oxygen, a peroxide or caustic soda the simple molecules of the liquid link up with one another and the resin polystyrol is obtained. The process is known technically as polymerisation and the properties of the resin obtained are determined by the conditions prevailing during the polymerisation process. Unfortunately, to obtain the best electrical properties the liquid styrene must be in a high state of purity and the conditions of polymerisation must be most carefully controlled; consequently the price of the resin is rather high.

Polystyrol is obtainable in powder form for moulding, or in sheet, film, roll or tube in crystal clear or various transparent and opaque colours. Since the presence of fillers or pigments may seriously impair its electrical properties only the best crystal clear should be selected for radio work. This latter has the appearance of glass. If a filler is desired in order to enhance its mechanical properties, the writers see no reason why powdered mica should not be used, on the lines of "Mycalex," which, as described in a previous issue (Bulletin, September, 1936, p. 106), is obtained from fusing together mica and glass.

The great disadvantage of quartz and the ceramics for radio and electrical work lies in the extreme difficulty of machining and manipulation. In polystyrol we have a material which softens and becomes rubber-like at temperatures above 65 degrees Centigrade, consequently it can be easily moulded to any desired shape, *e.g.*, coil formers, valve holders, condenser end-plates, etc., while at ordinary temperatures it can be sawn and drilled without difficulty. When working with it, its tendency to soften on warming must not be overlooked, and it is obviously not practical to use it where it will be subjected to much heat. In particular, caution must be exercised in the use of the soldering iron with polystyrol insulation. In sawing and drilling operations the application of cold water is advantageous.

Polystyrol is especially suitable for radio work at ultra-high frequencies; indeed in some of its properties it is superior to quartz or, for that matter, probably any known substance. Moreover, as the frequency is increased the radio-frequency losses actually decrease. On account of its resistance to chemical attack, its highly polished surface and its non-hygroscopic nature, polystyrol is eminently suitable for use out of doors, *e.g.*, feeder line spacers.

Polystyrol dissolves in certain solvents, *e.g.*, amyl acetate and in styrene itself, and pieces may be cemented together by the use of such a solvent. Excellent insulating materials may be obtained by impregnating fabric or paper with such solutions.

A summary of the properties of polystyrol follows:—

Specific gravity	1.05
Softening point	93° Centigrade
Water absorption	Zero
Tensile strength	7,000 lbs. per sq. in.
Transverse strength ...	14,000 lbs. per sq. in.
Coefficient of expansion ...	0.000099 per inch per deg. C.
Refraction index	1.07
Hardness	2 to 3
Dielectric constant	2.5
Permanent breakdown voltage	25 kv. per mm. approximately
Internal resistance	Infinity
Power factor 10 Mc. ...	.03 per cent.

Various components made from trolitul will shortly be obtainable from *Messrs. Denco*, **234**, Burrs Road, Gt. Clacton, Essex; in addition panels, rods and tubes will also be available.

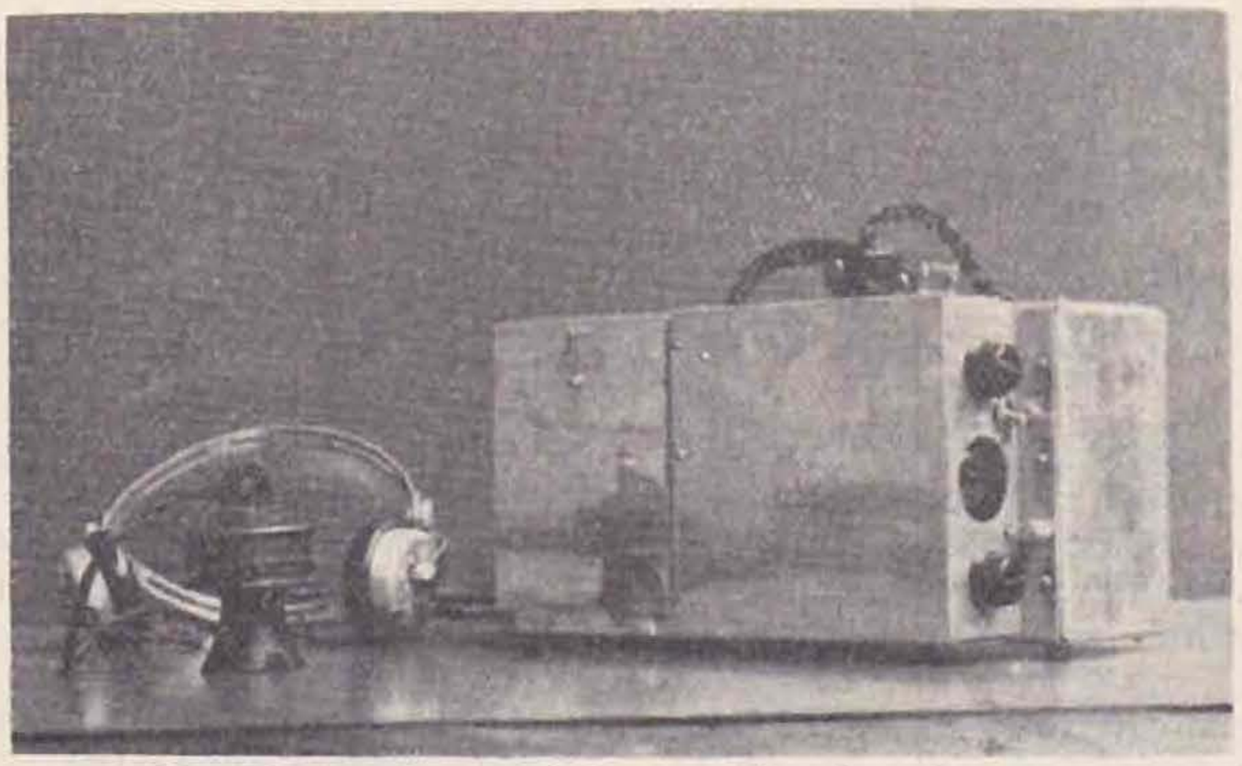
The GW Trophy.

Presented by Welsh amateurs for annual competition in connection with 56 Mc. work. The first holder is Mr. H. Jones, G5ZT.

Portable Apparatus for Ultra-High Frequencies

By J. E. Marshall, M.Eng., and L. A. Moxon, B.Sc. (G6XN) *

THE development of ultra-portable transmitting and receiving apparatus, with a view to obtaining the maximum utility from a minimum of equipment, makes a most valuable and interesting study. As many members of the Radio Section of the Murphy Radio Sports Club had indicated their interest, the task of producing equipment suitable for some preliminary tests was undertaken. Being gliding enthusiasts, the application of our results to this sport was of special interest. Other applications are fairly obvious. We selected the 56 Mc. band for our work on account of the convenience of being able to use small aerial systems, the freedom from interference, and the efficiency of the super-regenerative type of receiver at these frequencies. With super-regeneration, the apparatus becomes delightfully simple, and due to the broadening of tuning by the quench oscillations, the difficulty of tuning a normal ultra-short-wave receiver is non-existent, and the frequency modulation inevitable with a simple anode-modulated oscillator is harmless.



The Transceiver with its associated equipment.

It is, of course, on account of the general freedom from interference due to the absence of reflected signals, that this type of apparatus is satisfactory. The practical utility of 56 Mc. and higher frequencies is partly due to the absence (normally) of reflected signals, but even so the possibilities of DX are intriguing, and it is suggested that a tolerance of at least one-half per cent. should be allowed in setting the frequency of self-excited transmitters and a band, say, from 56.0 to 56.3 Mc. left clear for stable transmitters.

Frequencies much higher than 56 Mc. were less suitable for our purpose, on account of the reduced efficiency, though this might be overcome with special valves.

The first stage of our work consisted of the construction of two pairs of transmitters and receivers using more or less conventional circuits. The transmitters used *Mazda* L.2 and PD220A valves in a standard Class B circuit with intervalve and modulation transformers fairly generously designed so as to have efficiencies of 80 per cent. A measured 2 watts of audio power at 130 volts H.T. was available for modulating the oscillator.

The actual oscillator valve was the subject of much experiment, and we found that most ordinary 2-volt power valves, while they would give a useful output when first switched on, gradually lost their R.F. power efficiency owing to the high peak current drawn from the filament. We turned, therefore, to a valve designed for high peak currents, viz., a Class B valve; we eventually decided to use a PD220A double Class B valve with cross-connected anodes and grids as a push-pull R.F. oscillator. This proved quite satisfactory, and 100 per cent. modulation was obtained with about 1.5 watts mean carrier output.

The receiver comprised an H.L.2 as 5-metre oscillator-detector coupled to the aerial, another H.L.2 as separate "quench" oscillator working at a frequency round about 20 kc., and a transformer-coupled Pen220 L.F. stage feeding the headphones.

Using these instruments, two-way communication was maintained from Welwyn Garden City with a moving car over a radius of five miles, with only occasional "fade-outs" due to screening by hills, buildings, etc. For this test the car transmitter was operated from a 108-volt battery. The apparatus was bulky, however, and since much of the gear is duplicated in transmitter and receiver, we decided to make a "transceiver," which should be designed with the object of reducing size and weight as far as possible, sacrificing some efficiency, but gaining immensely in convenience and general portability, and still using standard components as far as possible. The transceiver "unit" was made detachable from the battery box so that the batteries could be stowed out of the way in any convenient space and connected by cable.

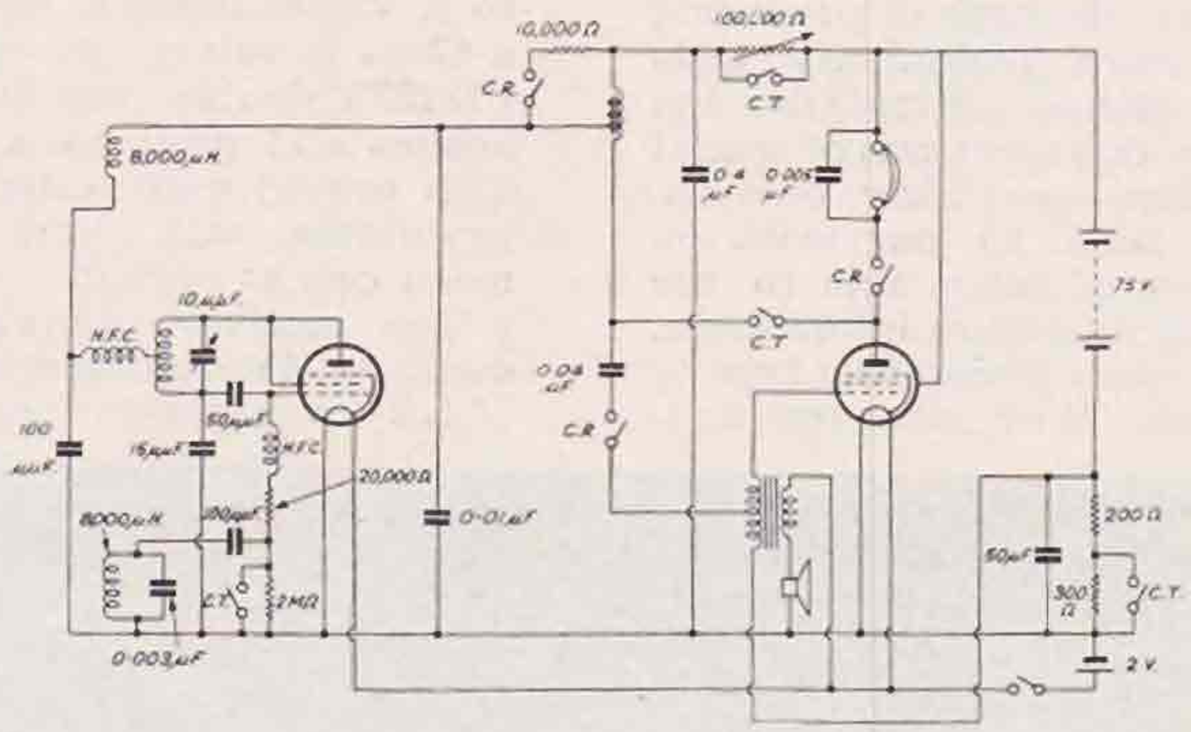
The Transmitter.

Skipping over all the intermediate work, we decided to use a Q.P.240 double Class B pentode valve as the complete transmitter or receiver. In the first case one half of the valve is the 5-metre oscillator and the other half the modulator, and in the second the functions are "self-quenching" 5-metre oscillator and L.F. amplifier respectively. At first we had difficulty in obtaining a reasonable R.F. output from the transmitting pentode, but by tying screen and anode together (thus making the valve a triode) and adding externally a balanc-

* Members of Murphy Radio Sports Club.

ing capacity of 15 $\mu\mu$F between grid and earth, we produced once more a reasonably efficient oscillator, with a filament still designed to withstand high peak anode currents. The need for balancing grid and anode capacities to earth is interesting, and the explanation is obvious when it is realised that at these frequencies the valve becomes essentially a Colpitts oscillator in which the electrode capacities provide the main tuning capacity and the tap into the circuit.

Modulation is by anode choke which also serves as feed choke to the intervalve auto-transformer on "receive." This transformer also carries an extra winding and becomes the microphone transformer on "transmit." The change-over is accomplished by two double-pole double-throw toggle switches linked together. Thus the 5-metre oscillator is changed from "transmit" to "receive" simply by switching the grid-leak from 20,000 ohms to 2 megohms. The quench coil is brought into circuit automatically by being connected across the large grid-leak. Another switch puts a limiting resistance across the feed choke, while another connects the I.V.T., and still another the headphones. In the "transmit" position the sensitivity control is short-circuited, the anode of the modulator is connected to the feed choke, and the automatic bias resistance is reduced to allow for the increased H.T. current to the oscillator. A P.O. type combination handset was re-wound to 3,000 ohms, and this with the complete transceiver weighing 16 lbs., and measuring only 11 × 6 × 6 ins., along with a 8-ft. dipole aerial fed *via* a length of twin flex feeder, completed the equipment.



Circuit diagram of the Transceiver described by the authors.

Aerials.

Aerial systems have been the subject of some experiment, but much has yet to be done. The best aerial so far for portable work, and quite the most convenient, is a half-wave dipole fed with a twin-wire 80-ohm feeder. Results vary enormously with the position of the aerial, and the higher this is above ground the greater the range.

A useful feature in portable work is the inherent A.V.C. action of the super-regenerative receiver. In the absence of a signal one hears the characteristic "rushing" noise due to random disturbances in valve and input circuit, as well as noises picked up in the aerial. When a signal is tuned in, the background is suppressed in proportion to the strength of the carrier, and with a strong signal is entirely absent. Another well-known advantage of super-regeneration is the improvement it gives in the ratio of signal to ignition noises.

Using the apparatus described, very satisfactory two-way contacts have been made between the ground and a glider in flight, though no great distances have yet been attempted. Horizontal dipoles were used and the directional effects were rather marked, so that vertical aerials, although necessarily shorter at the glider end, are likely to prove more satisfactory.

The actual range possible with this type of equipment depends so much on the geography of the country intervening between the instruments that no real estimate of it can be given, but it has been frequently shown that over open country, with suitable sites for transmitter and receiver, distances of 20-30 miles and more can be covered with simple apparatus.

In conclusion, the writers wish to acknowledge the co-operation of their colleague, Mr. G. B. Baker, in this work.

VE3 Tests on 3.5 Mc.

VE3ACC and VE3AAZ are desirous of making transatlantic contacts on 1.7 and 3.5 Mc. Towards this end they will be listening and calling for European contacts every Saturday morning commencing 0600 G.M.T., January 1, 1938. They suggest that European stations call them on either band between 0600 and 0610. They will transmit from 0610—0620 if no replies are received. VE3ACC will work on 1730 kc., and VE3AAZ on 3518 kc., or *vice versa*. B.R.S. members are invited to co-operate in these tests.

ZD9AB

As forecast in our last issue an amateur station is to be operated at the lonely Pacific island of Tristan da Cunha by a Norwegian expedition which recently left Cape Town. The call will be ZD9AB for transmissions with amateurs and ZOA for work with ships.

Can You Help ?

Mr. W. H. Matthews (G2CD), 7, Beddington Road, Seven Kings, Essex, will be glad to exchange information with members who have operated on 14 Mc. from an East-West location using an aerial *longer* than 66 ft. but bent at either or both ends.

Reports Wanted.

G2JI (Sheffield) on his 7,040 kc. transmissions. All reports will be acknowledged.

G5AX would appreciate reports from overseas listeners on his 14 Mc. C.W. transmissions. His QRA is Balmoral House, Moss Lane, Leyland, Lancs.

VK2ABL (New South Wales) on his 3.5, 7, 14 and 28 Mc. transmissions. All reports should be as complete as possible and will be acknowledged.

● *General specification* . . . . . .
Features—Four wavebands :
(1) 11.3—35 metres. (2) 35—100 metres.
(3) 195—580 „ (4) 725—2,000 „
Circuit.—8 valves. R.F. Amp.—mixer—oscillator—I.F. Amp.—twin diodes—L.F. stage — output stage — rectifier. Separate bass and treble controls. Electronic tuning indicator—Undistorted output 5 watts.

● *Controls layout* . . . . . .
1. Brilliance and two-position selectivity.
2. Wavechange switch.
3. (centre) Two-speed tuner.
4. Volume control and on-off switch.
5. Bass control.

The wavechange switch operates the wavescale indicator located in the top left-hand corner of the scale by means of a spring-loaded chain. In the opposite corner is found the electronic tuning indicator which has a variable-mu characteristic to avoid overlap.
The field winding of the electromagnetic loud-speaker is used for smoothing purposes in conjunction with an additional choke and three electrolytic condensers. These latter items are heat-insulated from the speaker frame.

● *Signal frequency amplifier* . . .
The signal-frequency amplifier, W63, amplifies the incoming transmission at its original frequency and this stage is provided to ensure a good signal noise ratio, some degree of selectivity, and freedom from self-generated whistles.
The aerial is coupled to this valve by means of the series-connected aerial coils which are wound adjacent to their respective tuned circuits. The fact that these aerial windings are connected in series whilst the tuned circuits are not, has no particular significance as it was done to effect certain economies in switching.
Tappings are brought out from the tuned circuits and taken to the anti-static aerial socket so that line matching is effected without the use of a separate transformer.
The signal-frequency amplifier is coupled to the frequency-changer, X.64, by the conventional tuned-anode method which enables maximum gain to be obtained from this stage with much simplification of coil assemblies and switching. Even so, the coils tend to become complicated when as many as four bands are wound on the same former.

● *Frequency changer & oscillator* .
As its name implies, the frequency-changer, X.64, serves the purpose of converting the signal frequency into that of the intermediate frequency, namely, 465 KC/S, and a separate oscillator, Z.63, tuned by this amount above the signal frequency is coupled to the oscillator grid of the X.64.
This system of using a separate oscillator is fast becoming standard practice in the better type of receiver, as it is usually easier to obtain the relatively large voltage output, minimises interaction between signal and oscillator circuits (pulling) and permits the use of circuit arrangements giving great frequency stability—a point of importance when going down as low as 11.3 metres.

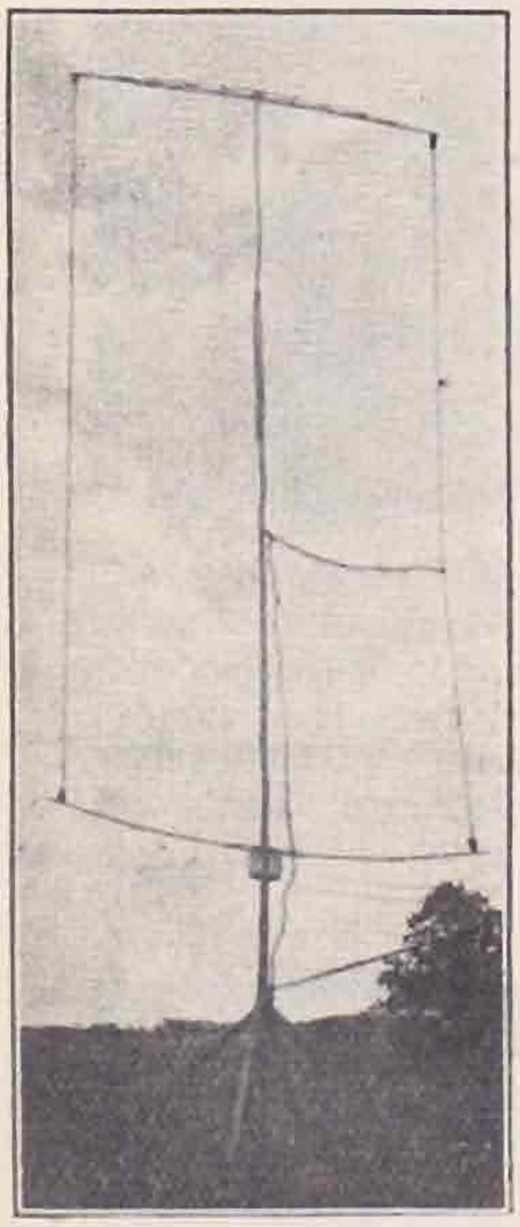
● *I.F. amplifier & variable selectivity* . . . . . .
Signals of intermediate frequency appearing in the anode circuit of the X64 are passed on to the grid of the I.F. amplifier, W.63 via one of the new iron dust-cored transformers and thence, after amplification to one diode of a twin diode valve, D63, for detection.
These I.F. transformers provide genuine variable selectivity which has no deleterious effect in the Selective position and affords a nicely flat-topped resonance curve in the Quality position.
The variable selectivity is actuated by the Brilliance control and is, in fact, a D.P.D.T. switch arranged so that maximum fidelity is obtained when this knob is turned fully anti-clockwise. A small movement in the other direction operates the switch and gives high selectivity. Further rotation in the same direction results in an increasing cut of the higher audio frequencies.

● *A.V.C.* . . . . . .
The signal and A.V.C. diodes are used in a conventional manner, care being taken, however, to proportion the AC/DC load of the former correctly to avoid all distortion of deeply modulated passages.
The AVC diode is fed from the same I.F. coil tapping through a small condenser, and its load is split so that the I.F. valve can be provided with half the available voltage drop; it must be remembered that this valve handles a considerable voltage swing particularly when receiving local stations which is where the backing-off voltage is greatest, and a large amount of distortion can easily be introduced if the valve is not working on a relatively straight part of its characteristic.

● *L.F. stage & audio tone controls* .
A Z63 with its anode and screen grid strapped is used in the L.F. or driver stage, the result being a medium-impedance triode.
The bass-cutting control consists of a small condenser in series with a larger one whereby the effect of the former is varied. Variation in top response is obtained by controlling the effective capacity across the L.F. transformer secondary.

An Effective and Inexpensive 14 Mc. Beam

By D. W. R. McKinley * (VE3AU).



The Beam Aerial described.

At this station the transmitter power is rather low for consistent DX in competition with the many high-powered stations on the North American continent; also, although a fairly good superheterodyne receiver is used, the terrific QRM here effectively blots out most foreign stations under average conditions. *So merely increasing the transmitter power is not the answer* even if we could afford it.

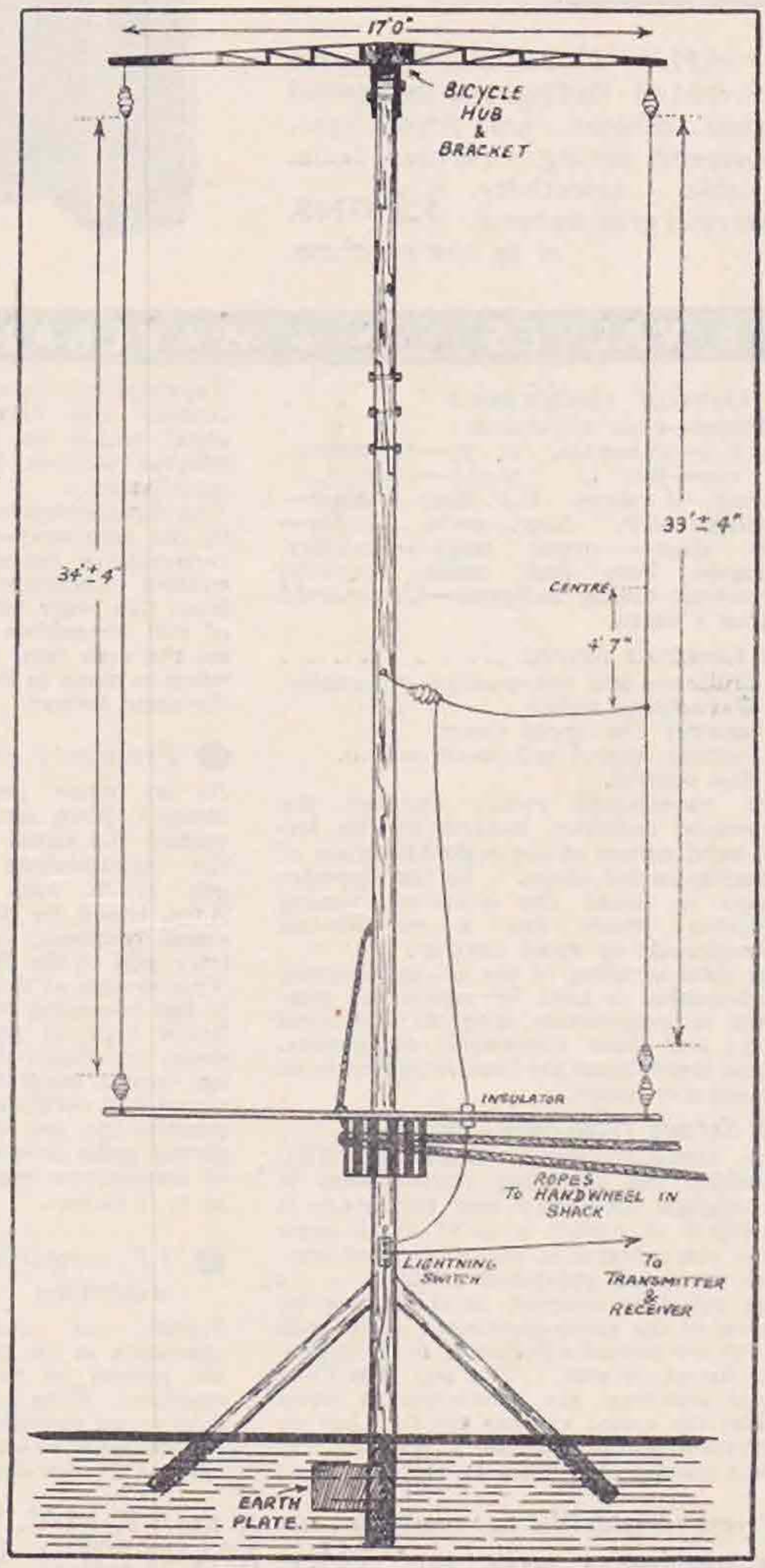
A directive aerial seemed to be the logical solution. As it had to cover every point of the compass and still be compact a rotatable system was erected, consisting of a half-wave aerial and a half-wave reflector spaced a quarter-wave from it.

The system provides a theoretical power gain of nearly two, over a single half-wave radiator, and in practical use the gain seems to be rather greater. Transmitting tests carried out with many amateurs on this continent and abroad show that there is an average drop of 4S points when the aerial is moved 120 degrees from the "head-on" position. Moving the beam 30 degrees to either side of the head-on positon has no effect on the signal strength, so the beam is sufficiently wide to cover a whole distant continent without adjustment.

When used with the receiver the variation in signal strength is similar to the transmitter pattern and is more pronounced on weak signals. Using a standard long-wire as a receiving aerial we find that a signal which is, say, S3 to S4 on the long wire is almost inaudible on the beam when it is turned 90 degrees or more from the signal direction and comes up to S6-7 when head-on. This, of course, helps tremendously in reducing QRM from stations in other directions.

With the beam pointed north-east, Europeans can be worked at 12.00 G.M.T. with no sign of the Australians, but a twist of the handwheel causes the Europeans to drop out, and with the beam due west the VK's answer our calls. Around 22.00 G.M.T. Australians and Europeans both come in from the same direction—north-east. This aerial enabled us to prove, with the co-operation of FB8AB and others that the South African stations came in the short way, i.e. from the south-east, about 05.00 G.M.T., but five hours later their signals were inaudible from that direction, but were roaring in the long way round with the beam pointed slightly north of west.

This system will sway in a heavy gale, but it takes at least a 40 m.p.h. wind to cause any noticeable QSB. The flexible poles will not break and they cost very little, whereas an equivalent lattice



Constructional details of the Beam Aerial used by VE3AU.

* Member R.E.S.

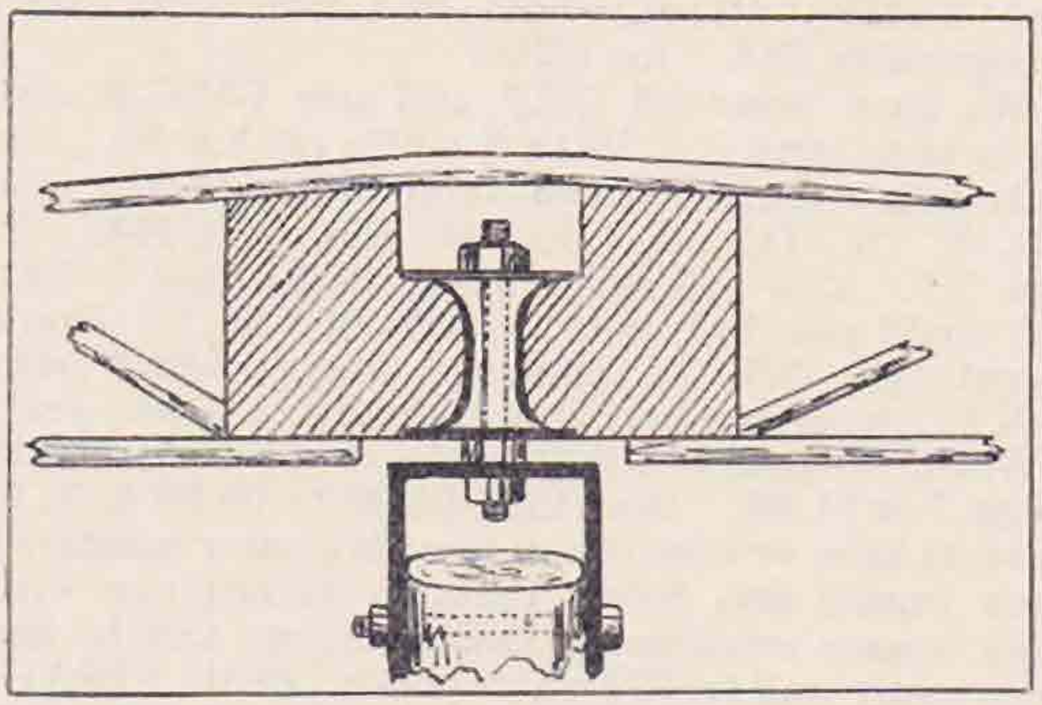
Increase 56 Mc. Range by C.W.

tower would be very expensive. A yard 20 ft. square will accommodate the whole beam and it may be erected without difficulty by three men.

During the week-ends of August and September, 1936, two hundred and fifty different foreign stations were worked, exclusive of N.A. All continents were raised on C.W. and five on 'phone with a 15-watt carrier. Compare this with a total of eighteen DX stations in five years of previous operation with non-directional aerials and higher powers. And the total cost was slightly over one dollar!

Constructional Details.

The poles are ash saplings dragged home from the nearest woods; the lower pole is 40 ft. long and the upper 15 ft. long. The poles are spiked and lashed with wire, and overlap 7 ft. Diameter at base 5¼ ins., at top 1¼ ins. Mounted height is 45 ft. when sunk 3 ft. in the ground. It is braced



Close-up of Hub and Bracket Bearing.

by odd 10-ft. lengths of two-by-four and old fence posts placed against the base.

The girder at the top is built of standard undressed plasterer's lath, 4 ft. by 1¼ ins. by ¼ in. An 18-ft. strip is made by nailing together five pieces with 6-in. laps. Three such strips form the girder, two flat on top and one flat on the bottom. At the centre they are separated 4 ins. by a wooden block and the taper is provided by blocks of successively smaller cross-section at 18-in. intervals. Bracing is supplied by strips of lath extending from the bottom of one block to the top of the next smaller one. At each spacing block the girder is bound overall with a loop of wire.

The bearing is an old bicycle hub. The centre block is drilled and split in a vertical plane, so it may be fitted on the hub between the flanges and is then bolted together again. By adjusting the nuts the axle is moved to one side slightly so it may be bolted to the top of an inverted U-bracket of 1-in. strip iron. The sides of the U slip down over the tip of the pole and are bolted to it.

The lower girder consists simply of one 18-ft. lath strip nailed to another to form a T cross-section and reinforced at the centre drum with extra lath.

The drum is 15 ins. in diameter and 15 ins. high. Four semi-circular annular rings of 7½ ins. outside radius and internal radius to fit the pole are cut from a 1-inch flat board. The drum is made in two sections by nailing 15-in. strips of lath spaced their own width to the semi-circular pieces, and then put together around the pole and fastened to the lower girder, which is, of course, slightly off-centre. Most of the weight of the drum and lower girder is taken by a short piece of rope fastened to the drum and to the pole.

A double loop of clothes-line rope is tied to the drum and the ends run sixty feet to the radio shack, the necessary bends being accomplished with small clothes-line pulleys. A broomstick is mounted horizontally through the shack wall and on the outside end it carries a small wooden pulley about which the rope is looped. The inside end has an old metal pulley which makes a presentable handwheel.

Enough wire is left looped at the lower insulators of the aerial and reflector to permit of adjustment with the aid of a step-ladder. Experimentally, the following table shows the best lengths in our case, using No. 16 S.W.G.:—

	Aerial.	*Reflector.*
	ft. ins.	ft. ins.
14,000 kc.	33 5	34 4
14,200 kc.	33 1	34 0
14,400 kc.	32 9	33 8

The feeder is soldered exactly 21 ft. 1 in. from the top of the aerial wire. This single-wire feeder, of any length, is connected directly to the plate tank at the point where the milliameter indicates optimum loading conditions. The receiver has low impedance primaries in the first r.f. circuit, and results were excellent when the feeder was simply hooked to one side of the primary and the other earthed. Another receiver tested required an external coil-and-condenser circuit with the feeder tapped on the coil to secure the best match.

Ham Movements.

G5SO has left England for a period and wishes to thank those who have co-operated in tests.

* * *

ST2BN has returned from the Sudan and is now living at Oxhey, Herts.

* * *

Mr. F. Johnston, BERS.276 (ex ZB1F) is now stationed at S.H.Q., W/T Section, R.A.F. Seletar, Singapore, where he hopes to be active under a VS1 call shortly.

Re Avo Meters

We have been asked by the *Automatic Coil Winder and Electrical Equipment Co., Ltd.*, to mention that the following instruments were stolen from a representative's car in Islington on November 2:

Universal Avometer, No. 66-5454; D.C. Avometer No. 6594.
Universal Avominor, No. U.23257-46, D.C. Avominor No. 41931-46.
Avo Oscillator No. 3150.
Avodapter and Avocoupler, no record of serial Nos.
Avo Exposure Meter, No. 14015-107. Smethurst High-Light Meter No. H.1012-67.
Avo Light Meter for measuring candle power, No. H.1020-37.
"P" Type Zeva Iron No. H.16.
"P.O." Type Zeva Iron No. G.109.

THE MONTH ON THE AIR

November, 1937

By H. A. M. WHYTE (G6WY).*

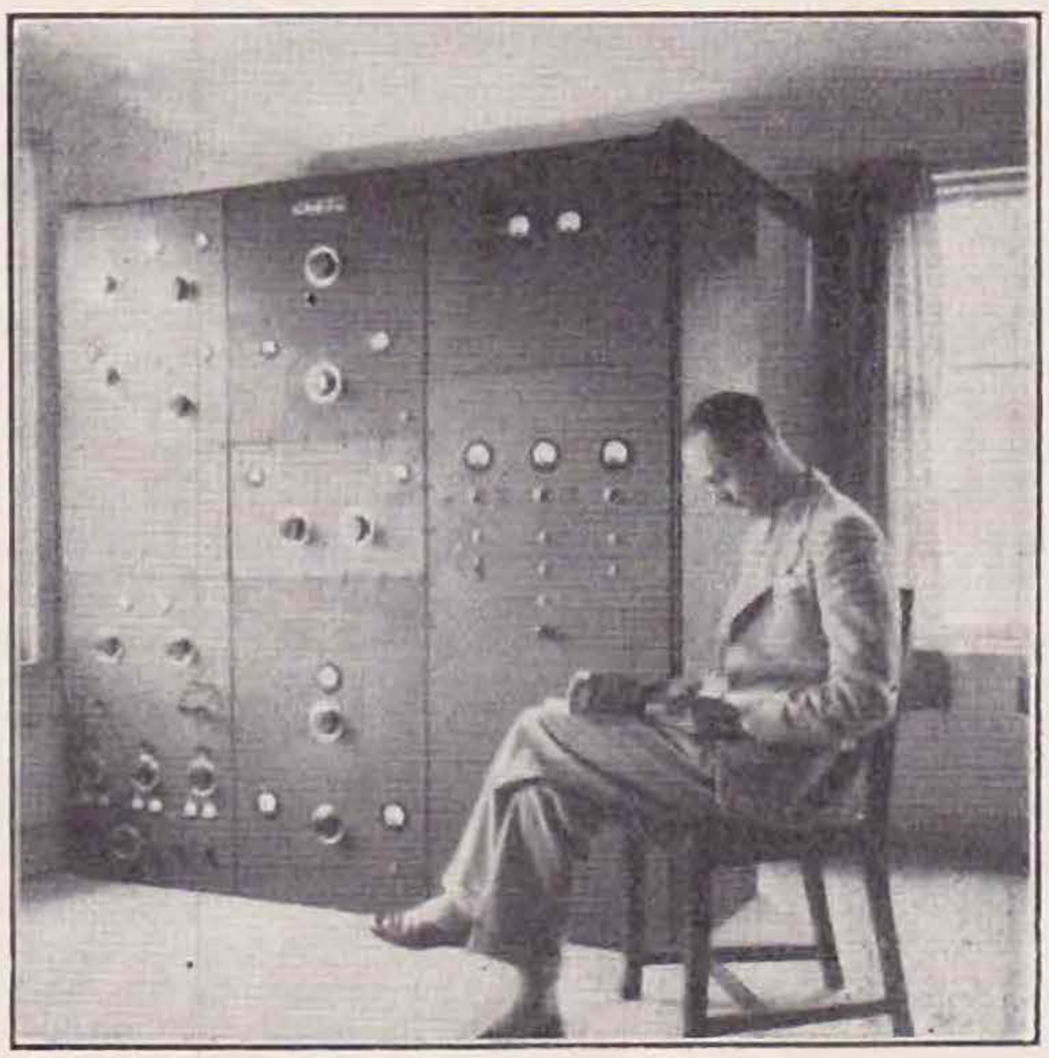
WE have all heard of the sins of many of our 7 Mc. 'phone operators, but the recent bad conditions existing on our high frequencies have developed a fault, difficult to forgive amongst our friends, of local telephony chats on 14 Mc. One listener, about 1,000 miles from London, and just in a nice S9 skip, informs us that the position is intolerable all over the British Isles. We know there is no rule or legislation to state that local telephony contacts are not permissible on 14 Mc., but let us put it to those who have been to blame. Do you think it absolutely necessary to test your transmitter night after night with a local station ? Cannot this be done on 7 or 3.5 Mc. ? After all, if the modulator performs satisfactorily on other bands, it should work on 14 Mc. A suggestion to those who operate nightly on 14 Mc. 'phone. When conditions are disappointing, try CW, you will probably be quite surprised at the DX you *can* raise. Phase distortion robs the phone man of many a night's operation, but phase distortion does not prevent a readable CW signal coming through. Let us remember that 14 Mc. is considered to be a 100 per cent. DX band, and keep it so for the benefit of everybody.

We mustn't be accused of writing sermons, so let's hear of some of the things of a less disturbing nature. G6ZO has won through the bad conditions by working two new countries, FB8AD and K7COI. He tells us that K6KVX is a portable in U.S.A. 3rd District signing with the break sign and " 3 " after the call. So many have written in reporting hearing K6KVX in Hawaii on 7 Mc. in the evening that this will enlighten them, and also remind everybody to listen a little more carefully before reporting anything as definite.

Another snag—OH5NK heard by G2HG on 56 Mc. was actually operating on 14 Mc. from his ship in the London Docks. 2BFL, who reported reception of AC4UU on 28 Mc. in this column some months ago, has now received a communication from the owners of this Expedition Station stating that AC4UU has not been on the air for three years, and is no longer in existence. Bad luck for G5KH, who worked him. Another interesting station is HO2U reported by many, and worked by G5AC when at Suez. HO2U is an American ship on a " Round the World Cruise," and is on its way to this country. If it can be ascertained that it was actually berthed in port at the time of a QSO, it can presumably count as a new country worked, but beware it wasn't on the high seas ! G2ZR tells G2RC that he used to know the pirate operator of XNA5C and worked him last February. He is in England, and ZR suggests that the next station to work him should ask for exact QRA, as the authorities have already been after him. Other strange calls heard were XOH2PW and XOZ3G, both presumably ships.

G5PP managed to get through local 'phones and work VQ8AS on September 2 at 17.55 G.M.T., thereby making the first Chagos-England contact. This cancels the claim by G6WY. T4TWO is still active, reported by G2MI, this time on 14 Mc. G2UV experienced great trouble in contacting South America and Asia owing to his aerial being wrong for these directions ; so he has been experimenting with a higher one in a different direction, and proved the old, old story at once, that the aerial is more important than the transmitter. Immediate success came, and contacts were made with PY2KX, VK2UF, VK3PE, VU2DR, ZL2CW and ZL2IW, all of whom had previously been " impossible DX " for G2UV.

We have preached QRP, and now GM5ZX says he is practising it. With 2 watts on 3.5 Mc., the following countries have been worked : G, ON, PA, F, OZ, D, SM, LA, OH, HB, OK, HA, SP, and YT. You will say, " Huh, all Europe." Yes, but could you do it with 2 watts on " 80 " ? Don't forget that 3.5 Mc. produces easy contact with U.S.A. in December and January. Last year, GW5FI worked W's with QRP, but could not do so on 7 or 14 Mc. Best time 04.00 to 08.00 G.M.T. Several have written to say they have now measured their inputs and found them in accordance with their licence conditions. G8MX is one, and he has done really well for 23½ watts phone ; ZS3F, FB8AH, FB8AF, VQ4CRE, ZE1JA, VS2AK, 16 W's and 2 VO's are his bag for the month. He says that ZS3F is in Windhoek, S.W. Africa, and the QRA of FB8AF is not correct in the call-book, so send cards for him to FB8AB.



GM6RG.
Our photograph illustrates Mr. Groom's station described last month.

* 9 The Mead, Beckenham.

G8KP another "G8 DX man," also has done well in working ZE1JI, ZE1JG, ZE1JV, FQ8AB, K7EVM, FB8AD, KA1SL, and VK's, ZL's, and ZS's. XON4MY informed him that the call came from an airport in Brussels with ON4MY operating. What does ON4XX say about this? XZN2B was worked and said he was in the Baltic, and was glad to arrive in civilisation again. He promised to QSL *via* NVIR, being a Dutchman. G8KP states that OOAFA is quite genuine, as G6ZN has received his card. No, KP; Districts of Australia and South Africa and U.S.A. *do not* count as separate countries. These are just three countries! Have patience, everybody, the long-awaited R.S.G.B. list should appear next month.

Oh, dear! G8DA, of 6-watt dry battery fame, is not so sure about G6GH's suggestion for an Honour Roll of countries worked, but feels sure we should publish a black list of those stations whose input is slightly in excess of what it should be, especially in contests. It's no good, DA, you can't prove a thing. He has worked SU, W1, 2, and 4, and heard VO6JQ, VO6D (QSL *via* VE2JK), K7COI, K7RT, VE5ACS (Resolution I. Franklin Terr.), and wants to know the calls of some members of the R.C.C. (American). G6WY and G2PL are two to start with.

From G6YL we received a message *via* ST2CM to the effect that Ken Rancombe (ex YI6KR and SU6KR) has arrived in Khartoum and is building a 100-watt transmitter to sign ST6KR, and will be on 28 Mc. in December. Full QRA of YI2BA is: Elie Solomon, Basrah Port Directorate, Margil, Basrah, Iraq. Thank you, YL. G6LI has heard on 7 Mc., K6KVX-3, HR4AF, and many W's. He tells us that CE7AA lives in the most southerly town in the world, and he visited him two years ago and heard many G's calling "Test BERU." We hear them in Great Britain too!

There is no doubt that a patch of bad conditions on 14 Mc. has had a wonderful effect in making us listen on 7 Mc., and some of the stations heard are even more interesting than on the higher frequency. G8CV worked YQ1SL, whose QRA was a ship at Galatz on the Danube in Rumania, and received a QSL, and on 14 Mc. worked ZS3F with grid-modulated phone ZS and W6 on CW and VK2GU on 28 Mc. phone. Unfortunately VK2GU does not appear to QSL! He heard OQ5AA, OXVC, and the usual run of K5's, YV, etc. G8CV does not think 350 volts is enough for 10 watts, as it only gives about 7 watts of grid-modulated phone. It is the input power that counts.

ZC3HU would be in Christmas I. if genuine; G6MC worked him on 14,300, but time was 08.17 G.M.T. which seems to be entirely wrong. G6XL has done well in working HS1BJ, HC2MR, K6BBT, K7FNE, and heard EL2M calling W's on November 13. G2RC reports two good "snips" for 7 Mc., YI5KG 7100, and VP2LD (St. Lucia) 7060 and K7RT on LF 14 Mc. G6ZO heard K5AG, K5AM, and LU5BL on 7 Mc. too.

Trinidad has apparently come to life again; GM6JD heard VP4CF (HF 14). Other DX included HO2U, FI8AC, YV1AK, K7GIE, and VO1C. By sloping his aerial he raised SU, ZS and PY8AE. Dominican Republic is another country that is becoming more active. During the month G6WY heard, on phone, HI7G, HI5X, HI3N, and on CW, HI91, and HI6O. The latter was using 5 watts to a single 59 when worked by G2OA and G6WY, and produced a new country for both. On the other side of the island, HH3L is doing his best, but appears to be equipped with a poor receiver or lack of operating ability. Another rare country is Palestine; K. J. Cook, ZC6AQ, and G2KK writes to say that there are only two known stations operating at present, these are ZC6AQ (ex SU1AQ) and ZC6RP Plenty of cards have arrived for 7 Mc. contacts with ZC6XA and ZC6BS, but these stations are bogus, and are believed to be in Europe. Luxembourg is not easy to contact. In a recent 7 Mc. phone QSO with LX1TW, G6WY learnt that there are only four stations operating at present, and they are all on 7 Mc. phone. So be very careful to make sure you are working a real LX if you work one on CW. Sierra Leone seems to be a favourite country to choose if you want to pretend to be anywhere but in your own. A large number of cards have just been destroyed at the R.S.G.B. for unknown ZD1 stations.

BERS195 again tells us how conditions behave at the other side of the world. He informs us that he has never heard of VK8AN (reported in August BULLETIN), and as he is in Darwin, he ought to know. He has great hopes of winning the VK/ZL Receiving Contest by amassing 29,416 points. The only G's he heard in very poor conditions were G6XL, 5VU, 2MA, 6WY, and GM6NX, and not a single G8; they must be all down to 10 watts! He has at last heard VK4KC in Papua and LX1AS (read above). Other good DX heard includes K6OVN (Guam), AU1AU (QRA?), SM5VQ (Swedish Film Expedition in Batavia, Java), XU9KA, VR1AM, PK6PA (Amboina I.), KA6PX, all on 7 Mc. and on 14 Mc.; VQ3FAR, LU5AN, OA4J, VR4OC, LU1CA, YI2BA, FM8AD, KA7EC, FB8AD, FR8VX, LX1AS, VU2AE, VU2DR, XU3XN (who told G2HW he was in Shanghai, had no cards, but would QSL by letter), and on phone CE1AO, VS2AK, ZU6P, KA1YL. (See calls heard for the rest!)

GI6TK puts Northern Ireland on the map by reporting contacts with K7COI, K7KD, FI8AC, KA1SL, and many VK's and S. Americans. OHKI was worked several times, and gave his QRA as near Leningrad, so he looks like a Finnish ship in the Baltic. He heard ZD2D in Lagos, VS6AO, VP1NB, XU8RL, FP8PX, HH4AS, and VS5AZ. The last one is entirely new to us. He queries SX3A. This is a semi-commercial station using 500 watts ICW, in Athens worked by many G's several years ago; he only had 200 cards printed and will not send any more. The early birds who worked him got their card! SV1RX supplies this news. G8FF is a newcomer to this page, and has worked RX1B, UK8IA, XU8RL, FQ8AB, and K7DNL, and queries whether the latter is genuine, as he worked him three times in two days, morning and evening. Yes, he's OK, as we work K7 over the North Pole, and the signal goes the same way morning and evening. He has worked many W's on 7 Mc. lately.

A real QRP exponent is G5IU. Having changed his QRA from London to the country, he started well by working with 350 volts only: HC1JW, OA4AQ, CE7AA, FY8A, K6BBT, K7RT, K7GIE, FI8AC, HH3L, FM8AD, NY1AE, VE5LO, VE5ACS, VO3Z (Belle I., Labrador). Like G8IL,

(*Continued on page* 347.)

Guglielmo Marconi*

BEFORE a distinguished gathering of scientists and engineers, Sir Ambrose Fleming, M.A., D.Sc., F.R.S. (Honorary Vice-President, R.S.G.B.), delivered an address at the Royal Society of Arts on November 10, 1937, entitled "Guglielmo Marconi and the Development of Radio Communication."

Commencing with an historical survey of the development of telegraphy systems by the use of electro-magnetic waves, Sir Ambrose proceeded to describe the suggestions made, by Hughes in 1879 and Sir William Crookes in 1892, for the use of Long Maxwell Waves.

Dealing with the beginnings of electric wave telegraphy, the lecturer paid tribute to the work of our distinguished Past President, Sir Oliver Lodge, who, in 1894, gave a demonstration at the Royal Institution on the use of his coherer as a detector of electric waves, and experimentally showed some of Hertz's important discoveries. Details were given of a further lecture conducted by Sir Oliver later that year, when he demonstrated with the aid of a Kelvin dead-beat mirror galvanometer and a Morse inker how alphabetical signals could be transmitted over short distances by electric waves.

Sir Ambrose then described how Marconi, at that time a young man, 20 years of age, set about the task of improving upon the results of Lodge and other scientists. Reference was made to Marconi's earliest experiments with spark balls and of his visit to England in 1896, when he demonstrated his improved signalling system to Sir William Preece and other prominent officials of the G.P.O.

Mention was made of the fundamental patent issued to Sir Oliver Lodge in May, 1897, in which he showed a transmitting station equipped with a Hertz oscillator of large capacity placed in a vertical position out of doors, and also a receiving station with coherer, to the terminals of which were attached a similar pair of large plates, the two systems of the transmitter and receiver being tuned to the same frequency.

The pioneer work of yet another R.S.G.B. Past President, Admiral Sir Henry Jackson, was mentioned, Sir Ambrose describing how, in 1891, Sir Henry conceived the idea of using Hertzian waves for naval signalling. In 1896, Sir Henry devised a practical form of coherer.

Summing up the early work which preceded Marconi's practical achievements, Sir Ambrose said: "It is impossible to designate Marconi (as is sometimes done) the sole inventor of wireless telegraphy by electric waves. He made important constructional improvements in the coherer, tapper and receiving apparatus generally by which it was made more certain in operation and capable of being handled by non-scientific persons. His great contribution to it were the elevated aerial wires with capacity at the top and earth connection, both to the oscillator and the coherer by which an immense extension of range was at once bestowed, and by this he converted experimental apparatus into a practical system of wireless telegraphy by electric waves."

* *During his lifetime an Honorary Member of R.S.G.B.*

Dealing, further, with Marconi's early work, Sir Ambrose described the tests in 1898 between Alum Bay, Isle of Wight, and Bournemouth (14 miles), and the first cross-channel work between Dover and Wimereux the following year.

The story of the transatlantic tests in 1901 was told again in some detail and a reference made to the famous 7777 patent issued to Marconi in 1900.

Sir Ambrose then outlined the work of Heaviside and Kennelley, who independently suggested that the ionisation of the earth's upper atmosphere by solar light had the effect of making a conducting layer at a great height above the earth which afforded a reflecting or refracting region, causing curvature of long electric waves round the earth.

In his reference to the subject of Directive Wireless Telegraph, Sir Ambrose said: "Much of our scientific research work is done by men who can only give to it overtime from professional occupation. Moreover, technical invention requires considerable expenditure."

Mention was made of the establishment of long-wave high-power radio stations and to the beginnings of short-wave wireless telegraphy.

We owe a debt to Sir Ambrose for his very kind reference to the early work of radio amateurs. Quoting from his address, Sir Ambrose said:—

"When wireless telegraphy in England was brought under control of the Government it was not desired entirely to prevent amateur research and, therefore, amateurs were allowed to generate waves of less than 200 metres wavelength, because at that time such waves were considered useless for practical telegraphy. They were, in fact, given to the amateurs to play with as one may give a toy to a child. But clever amateurs soon discovered that although waves of 100 metres length did not travel far along the earth's surface, yet when shot up at the sky they could give good signals at places even beyond a thousand or two thousand miles away. They were in fact reflected down from the upper layer of the ionosphere. Such communication could be established with power of only a fraction of a kilowatt. Experts soon realised that a new field of research had been opened."

The creation of the Franklin Beam aerial was mentioned, as were the numerous tests on short waves conducted by Marconi from his yacht *Elettra*.

The address concluded with brief references to the Imperial Short-Wave Beam service and recent ultra-short-wave research.

Summarising the work of Marconi, Sir Ambrose said:—

"In the first place he was eminently utilitarian. His predominant interest was not in purely scientific knowledge *per se*, but in its practical application for useful purposes. He had a very keen appreciation of the subjects on which it was worth while to expend labour in the above respect.

"In this work he had enormous perseverance and powers of work. He was not discouraged

by initial failures or adverse criticisms of his work. He had great power of influencing others to assist him in the ends he had in view. He had remarkable gifts of invention and ready insight into the causes of failure and means of remedy. He was also of a uniform temperament and never seemed to give way to impatience or anger, but he did not suffer fools gladly or continue to employ incompetent men. He complied in a high degree with the definition of an engineer given in the Charter of the Institution of Civil Engineers, as one who utilises and controls the energies of Nature for the assistance and benefit of mankind."

Sir William Bragg, O.M., K.B.E., M.A., D.Sc., F.R.S., Director of the Royal Institution, who presided, in moving a vote of thanks, spoke of the tremendously important part which Sir Ambrose himself had played in the development of practical wireless communication. His epoch-making discoveries in connection with the development of the thermionic valve were of no less importance than the pioneer work which he carried out as adviser to the *Marconi Telegraph Co.* when it was decided in 1897 to operate a transatlantic service.

Mr. C. C. Paterson (Past President of the I.E.E.) associated himself with Sir William in the vote of thanks, and spoke of the vitality of Sir Ambrose who, in spite of advancing years, was still able to hold his audience interested in every utterance.

Prolonged applause followed the vote of thanks.

Those who were privileged to be present will cherish a happy memory of Sir Ambrose Fleming—that wonderful personality who has done so much to place British Wireless Telegraphy on its present high pedestal.

J. C.

THE 56 Mc. BAND

By L. G. Blundell (G5LB). *

WHILE news is again varied, there is a welcome increase in DX reports, and it appears that conditions are more favourable for long distance contacts than has recently been the case.

On November 14 at 1235 G.M.T., G6NU (Gillingham, Kent) heard signals from OH7NC at 238. This was during a prearranged schedule between the two stations. G2HG heard a French speaking phone station on the 20th at 1515 G.M.T., but no call sign received. At 2235 G.M.T. on the 23rd. HG heard " CQ DX de OH5NK " at 554. At 2242, the same station was heard to call OH2PS, and at 2250 another CQ was put out. G2HG would like to know if this station has been worked, or heard, on the lower frequencies recently. The G2HG-6FL schedule continues to produce frequent contacts, and 2HG heard that signals from 6FL have been reported by G8OS in Billingshurst, Sussex—a 90 to 100 mile " hop." Good going, 6FL!

The remarks regarding activity in Scotland in last month's pages were, it seems, a little behind time, as GM6RG reports that his signals have been received by W2JCY and 2KHR. GM6RG has actually been in QSO with the States, but unfortunately the American was coming back on 28 Mc. Fine work, OM!

G6YL and 5QY still maintain regular schedules, and have been testing out sundry aerial systems. The counterpoise portion of a 1.7 Mc. system at 5QY produced some remarkable results in view of the fact that it is only about 7 feet above ground level.

G6GR reports regular CW activity as follows: Weekdays, 2200 and 2300 G.M.T., and 1100 to 1200 on Sundays. He will be pleased to arrange schedules on written request.

Thanks to G5QA, who went to the trouble of putting through a " DX " call to HQ (via landline) to the effect that a large number of VK and ZL stations would be active during the two days, November 27 and 28. The writer promptly QSP to other South London stations, and hoped for a " snowball " effect, as this was the only means of informing those interested. Well, any luck anybody —anywhere ?

G5HH furnishes information to the effect that OH7ND is now regularly active on 56 Mc. He has a beam aerial directed on this country and is transmitting every day at 09.00 until 10.00 G.M.T. As far as is at present known, the Finnish station is not able to receive on this band but is QRX on 28 Mc. for reports.

And now for 1938! What is the first International CW contest going to do for 56 Mc.? Are you in a position to receive a weak CW signal? Will you stand a chance of a DX QSO should conditions be favourable? Come on now, only a matter of two weeks before the word " go," and still no CW activity at G——. *Are* we going to show the world, or are we not? *It is your signal the VK's, W's, ZL's, and the rest of the world want to hear on* 56 *Mc.* So get going, lads—and good luck.

In conclusion, the writer offers sincere thanks to all those who have been good enough to report regularly for these notes, and have thereby made the preparation of same a worthwhile job. He asks you to continue the good work as regards this page, and additionally to send in your CW contest report (as per rules—see last month) regularly to HQ. Thanks.

And now for the festive season, so Cheerio, 73, and happy days!

* 22, Piquet Road, Anerley, London, S.E.20.

Stray

Mr. I. B. Clark (2BIB), of 5, Wellfield Avenue, Muswell Hill, N.10, will welcome reports of scientific value or abnormal interest on transmissions from G5JM. Those willing to co-operate in propagation and other experiments should communicate with 2BIB. Frequencies in use by G5JM are 1.7 to 112 Mc., excluding 3.5 Mc.

"Twelve Years Back"

By Uncle Tom.

The Wise Old Owl forsakes his Shack,
And dreams sad dreams of twelve years back.

DECEMBER, 1925! What a time that was, with everyone discovering that the "ordinary ham" could work Australia and New Zealand, and that it wasn't necessary to leave that job entirely to the he-men with 250-watt permits. Why, the Editor of this journal even appealed for more activity on the DX bands! Extract from his Editorial: "We want more signals going out from this little island; let the world hear what we can do; A's and Z's can be worked comfortably with 50 watts." I imagine that anyone who said that to-day would stand a good chance of being murdered. "More signals," indeed!

The same month seems to have seen the birth of the District Representatives' scheme. R.S.G.B. membership was divided up into groups—Ireland, North Britain, Mid-Britain, South and South-East Britain, West and South-West Britain, Wales and Scotland.

Southern Notes disclose the fact that G6LJ was off the air, his 250-watter having developed a pip in the crack. Goyder, of G2SZ, established the first contacts between Great Britain and the U.S. 6th district—decidedly in the pre-California-kilowatt era. But oh!—what a glimpse of 40 metres: "One of the most peculiar features of this waveband is the way all local signals disappear almost completely before sunset. During daylight European signals arrive with terrific strength, but at night-time everything seems quite dead locally, and hardly a station can be heard." What have we come to since then?

Up comes G5SI, the QRP wizard, again, working U.S.A. in daylight with two-thirds of a watt! And that on 45 metres. Northern Notes show the star stations to have been G2XY, G5MO, G2CC (who remembers "Two clickety-click"?) and G5SZ.

A little snippety-bit runs as follows: "Say, OM, wouldn't it be wonderful . . . If WIZ stopped calling ABC; If all the 45-metre G stations were on exactly 45 metres; If some of those sixth district hams could hear us . . ." and so on.

Here's an early glimpse of "Our Arthur": "Just listen to one of our youngest transmitters (2MI, Margate) putting clear speech across the estuary with 60 volts dry cells H.T. on a D.E. valve. Received on two valves at 34 miles, R4 with plenty to spare." Then follows the cryptic comment, the meaning of which can be known only to the Editor: "Why do we foy armatures?" I'll give my collection of spitch-QSLs to anyone that can solve that.

I think a little poem by G2XV is worth quoting in full, not only because it shows Gerry's poetic tendencies at quite an early age, but also because it might have been written in 1937 instead of 1925. Lor', 'ow we do progress.

"Up on aloft the antenna hangs hign
Catching the signals from out of the sky.
And the other end sits a ham with a smile,
Who takes out his key points and cleans with a file.

"He watches his clock like a cat does a mouse,
To be clear of the concert which fills every house.
He daren't touch his key till the concert is o'er,
Else he would soon hear from the person next door.

"He watches and waits till the minute does come,
Then he starts up his M-G with such a sweet hum.
He gives a 'test' call 'cos CQ's aren't allowed,
When there comes a reply, he feels very proud.

"One morning early he jumped out of bed
With all good intentions to search for a 'Z.'
He picked up a faint one and gave him a call,
Back came an answer FB and all.

"When next he changed over to search for reply,
The 'Z' was not there whate'er he may try.
He was drowned by a roar which chattered the phones,
And sounded so harsh that it tickled 'ham's' bones.

(*Moral*)

"So you see that A.C. serves us all such a dance,
What a pity that place is so near to us—
FRANCE!!"

One interesting little par. catches my eye: the announcement that the prefix "GI" was sanctioned for Northern Ireland transmitters. GI6TB, passing on the information, said: "This does not apply to the Free State, which is not under the G's, so far as I know." Comment unnecessary.

An advert. for quartz crystals also makes me smile. The advertiser (Sec Seldom Sleeps) says: "No two crystals will be supplied of the same frequency. Having control of the distribution of these oscillators, the elimination of interference is assured since no crystal-controlled set will ever be able to operate on the same wavelength as another." Price of crystals, by the way, £4. And I believe our crystal specialists still get letters from people who want frequencies that haven't previously been supplied to anyone else.

Now for *QST*, December, 1925. Hold this one: "Some foreign amateurs are taking the liberty of sending bundles of QSL cards to Headquarters for distribution, when there are at present obtainable call-books giving the addresses needed. The following list of call-books and prices is given for their information."

In the Traffic Department there was a lovely description of an evening's DX with 1NUT, who might be the dead spit of thousands of nitwits still on the air to-day. He calls 20 CQ's, signs twice, swishes round the dial, and says, "Huh, nobody on to-night." CQ's again for five minutes and says:

(*Continued on page* 347)

Campbell Swinton and Television*

By Dr. J. D. McGee.

THE successful inauguration by the British Broadcasting Corporation of the high-definition television transmitting station at Alexandra Palace has focused the attention of the technical world on the successful development of the all-electric, instantaneous system of transmission. The degree of success achieved shows that the cathode ray transmitting tube has at last emerged from the research laboratory to take its place as the complement of the receiving cathode ray tube. The latter is well known, and has been recognised for some years as the most effective means for picture reception, and is now a highly developed commercial product. Modern television technique, which will withstand the criterion of the flickerless talking picture, both from the producing and reception points of view, has only been made possible by the development of the receiving and transmitting cathode ray tubes. This development is the result of improvement in technique brought about by the work of many scientific investigators in research laboratories throughout the world.

The manufacture of the modern cathode ray tube for picture reception has evolved slowly as improvements in vacuum technique, glass manufacture, fluorescent materials have been made, while the transmitting tube inherits also the wealth of developments in photo-electric technique. Besides these key units, the whole television equipment—amplifiers, scanning oscillators, pulse generators, cables, radio transmitters, etc.—have each been improved to a stage where they are capable of dealing with the enormous frequency bands, exacting phase conditions, etc., which are necessary for the production of high-definition flickerless picture. This has been achieved by improvement in valve and circuit technique spread over the last twenty years.

The object of this article is to pay a tribute to the memory of a man who probably thought more deeply, clearly and disinterestedly about television than any other of his time and who, had he but lived six years longer, would, I believe have agreed that his life-long dream had at last come true.

The late Mr. A. A. Campbell Swinton was the first to propose[1] an all-electric system of television in 1908, and continued to urge its claims[2] up until the time of his death in 1930. Sir Richard Gregory has recently reminded us of Campbell Swinton's early suggestions in connection with television[3], but it might not be redundant to show how Campbell Swinton continued to develop his ideas as technical methods advanced during the remaining twenty years of his life. He first suggested the idea in a short letter to *Nature* in 1908[1], later explaining and amplifying it in his presidential address to the Röntgen Society on November 7, 1911[4]. This plan of twenty-eight years ago only required the application of modern technique to become the non-mechanical system now installed at Alexandra Palace, and still in course of development in Germany and America.

It is worth while quoting at some length from the published papers of Campbell Swinton in order to emphasise not only the remarkable accuracy with which he visualised his scheme, but also the kindly unassuming manner in which he presented it to the world.

Campbell Swinton's definition of television is worth noting when considering modern developments, in order to appreciate the difference between television proper and telekinematography. He defines television thus[5]: "If you point a photographic camera at any view or object, whatever is in front of the lens is depicted on the ground glass screen, and what I mean by television is some method whereby what is depicted on such a screen, with any motions or other changes that may be taking place, is electrically transmitted to a distance and made reappear instantaneously on a similar screen at the distant station." This conception of television is implicit in all his early publications.

Referring to a letter from Mr. Shelford Bidwell in *Nature* of June 4, 1908[6], in which the difficulty of obtaining synchronism with mechanical television systems was discussed, Campbell Swinton observed[1]:

". . . this part of the problem of obtaining distant electric vision can probably be solved by the employment of two beams of kathode rays (one at the transmitting and one at the receiving station) synchronously deflected by the varying fields of two electromagnets placed at right angles to one another and energised by two alternating electric currents of widely different frequencies, so that the moving extremities of the two beams are caused to sweep synchronously over the whole of the required surfaces within the one-tenth of a second necessary to take advantage of visual persistence.

"Indeed; so far as the receiving apparatus is concerned, the moving kathode beam has only to be arranged to impinge on a sufficiently sensitive fluorescent screen, and given suitable variations in its intensity, to obtain the desired result.

"The real difficulties lie in devising an efficient transmitter which, under the influence of light and shade, shall sufficiently vary the transmitted electric current so as to produce the necessary alterations in the intensity of the kathode beam of the receiver, and further in making this transmitter sufficiently rapid in its action to respond to the 160,000 variations per second that are necessary as a minimum.

"Possibly, no photoelectric phenomenon at present known will provide what is required in this respect, but should something suitable be discovered, distant electric vision will, I think, come within the region of possibility."

This 1908 statement is, undoubtedly, the first published suggestion of a television system which has now been developed on a commercial basis to produce pictures of even higher order of definition than the inventor then proposed as a satisfactory minimum. In the elaborated account of this suggestion in his lecture to the Röntgen Society in 1911, Campbell Swinton gives more details of

*This important article appeared in *Nature* dated October 17, 1936, and we present it here with the kind permission of the Editor of that Journal, and the author, Dr. McGee. Mr. A. A. Campbell Swinton was Founder-President R.S.G.B.

his proposed transmitting tube, and while it is crude in comparison with a modern transmitting tube, anyone who is familiar with the development of the subject will agree that it was an enormous step in the right direction. It is characteristic of the man that, in proposing his suggestion, he emphasised that[4]:

"it is an idea only, and the apparatus has never been constructed. Furthermore, I would explain that I do not for a moment suppose it could be got to work without a great deal of experiment and probably much modification. It is, indeed, only an effort of my imagination, and can be useful merely as a suggestion of a direction in which experiment might possibly secure what is wanted. What, however, is claimed is that, so far as I am aware, it is the first suggested solution of the problem of distant electric vision in which the difficulty of securing the required extreme rapidity and accuracy of motion of the parts is got over by employing for these parts things of the extreme tenuity and weightlessness of cathode rays."

What must astonish the modern television engineer is the accuracy of Campbell Swinton's idea, when he reflects that, at the time it was suggested, radio communication was in its infancy, radio valves practically unknown, vacuum technique very primitive, photo-electric cells very inefficient.

In the period following the Great War, much time and money was spent in developing mechanical systems of television to the present high limits of mechanical efficiency, but the all-electric system has proved, after a comparatively short period of development work, to be much more powerful.

Campbell Swinton repeatedly pointed out the limitations of the mechanical methods, and repeatedly urged that the development of the all-electric system should be taken up seriously by some large industrial research laboratory. "There are, at any rate," he wrote[7], "no theoretical objections to the scheme, and it is now for some ingenious experimenter to work out the details of the apparatus and to give the world some form of television by this means."

It may justly be asked—"Why did not Campbell Swinton develop his own scheme?" The answer is twofold—first, that he did carry out experiments along lines which have recently proved successful, and second, that physical technique was at that time quite inadequate to deal with the problem. In a letter to *Nature* of October 23, 1926[8], Campbell Swinton wrote:

"I actually tried some not very successful experiments in the matter of getting an electrical effect from the combined action of light and cathode rays incident upon the selenium-coated surface. . . . The transmitting apparatus consisted of a home-made Braun oscillograph in which a metal plate coated with selenium was substituted for the usual fluorescent screen, the image to be transmitted being thrown by a lens upon the selenium surface, and the end of the cathode ray beam being caused electromagnetically to traverse the projected image. Experiments were also tried in receiving with a Braun tube which I purchased in Germany, but in its then 'hard' form it proved very intractable."

It is interesting to note that this actual experiment has been repeated recently in the Research Laboratories of Electric and Musical Industries, Ltd., under the direction of the present writer, and has proved successful. Two important features of the modern transmitting tube are described in this short note, namely, the use of a "signal plate" and the projection of the optical image on to the same surface as is scanned by the electron beam—another step in the right direction.

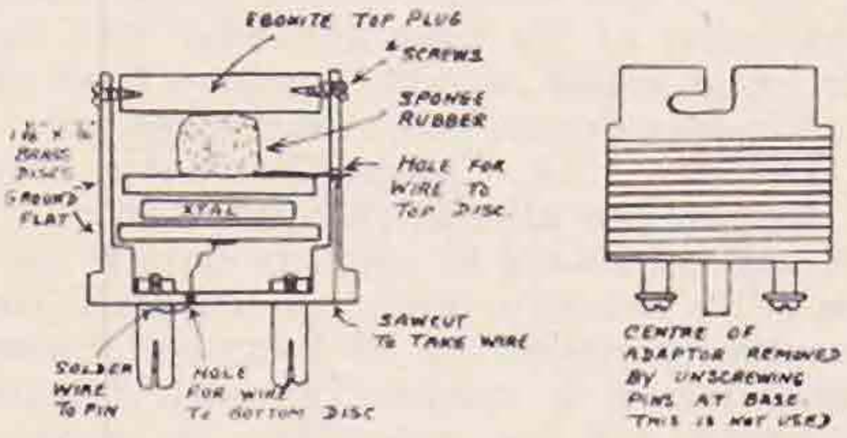
This solution of the problem of high-definition television was not a "one-man-job," as Campbell Swinton saw clearly[9], but one which could only be solved by the close co-operation of a large band of research workers having at their disposal the facilities of a well-equipped research laboratory. The problem has been attacked during the last decade in many of the large industrial research laboratories in America, Germany and Great Britain, and the progress in many of these organisations has been roughly parallel, but it is fitting that Great Britain should be the first to inaugurate a public television service employing the system which was first outlined twenty-eight years ago by a distinguished British scientist.

[1] *Nature*, 78, 151 (June 18, 1908).
[2] "Autobiographical and other Writings." A. A. Campbell Swinton, pp. 131-137. (Longmans, Green and Co., Ltd.)
[3] *Nature*, 137, 984 (June 13, 1936).
[4] *J. Röntgen Soc.*, Jan. 1912, p. 7.
[5] *Wireless World*, 14, 51 (1924).
[6] *Nature*, 78, 105 (June 4, 1908).
[7] "Autobiographical and other Writings." A. A. Campbell Swinton, p. 137.
[8] *Nature*, 118, 590 (Oct. 23, 1926).
[9] *Wireless World*, 14, 118 (1924).

A Simple Crystal Holder

A cheap and effective crystal holder for amateur use, may be constructed from an ordinary electric light adaptor and holder, both of which can be obtained at the local 6d. stores.

Remove the two pins at the bottom of the adaptor and remove the bayonet socket assembly. The holder which remains will be found to have a ridge round its inner circumference which will conveniently support the lower plate of the crystal holder.



This plate may be connected to its appropriate pin by means of a piece of No. 30 swg. wire, passed through a small hole, drilled in the bottom of the adaptor. The connection to the top plate may be taken through the side of the holder, by drilling a small hole and then slotting the side to take the wire, and secured with a spot of sealing wax.

The top cover may be cut from a piece of ebonite and after fitting, can be secured by two small screws. A piece of sorbo sponge rubber, as shown in the accompanying sketch will maintain the necessary pressure on the crystal. 2CVN.

The R.E.S. Television Group

By E. L. Gardiner (G6GR). *

ALTHOUGH over a year has elapsed since the formation of the R.E.S. Television Group, only a handful of members have so far signified their interest, and of these it would seem that the majority are only concerned in the theoretical aspects of the subject. To date, the Group Manager has not heard from a single member who is actively engaged in practical work, a state of affairs which seems extraordinary in view of the regular transmissions from the Alexandra Palace. A few advanced members are known to be using television equipment, but it was anticipated that by this time many others would have taken a hand in the work of the group.

It is perhaps natural that television should not appeal to Society members in quite the same way as does ordinary amateur radio, for not only is the excitement of DX absent, but licences for television transmission are not available, and the cost of receiving apparatus is admittedly high. However, with the B.B.C. transmissions so well established and with foreign transmissions steadily on the increase, the inducement to experiment with receivers of a flexible nature must surely be growing. It is already a well established fact that the B.B.C. transmissions are being heard at long distances, and instances have been recorded of the reception in this country of various foreign programmes.

Many amateurs are turning to the ultra-high frequencies for relief from the overcrowded conditions on the lower frequency bands, and a great many pleasurable contacts have been established on 56 Mc. Nowhere else, perhaps, is there such a wide scope for new experiments, and the reception of television on wavelengths below 10 metres fits in admirably with any other work which may be on hand in that part of the spectrum.

A radio receiver suitable for the reception of television is far from useless for other purposes, particularly if it is provided with a method for varying selectivity, such as is provided by changing or removing the damping resistances usually fitted across the I.F. couplings by the use of ganged switches. In obtaining the linear response and high sensitivity necessary for television reception at great distances, much can be learnt that is of value in the reception of amateur signals. For those less ambitiously inclined or who are badly situated in the reception of possible foreign signals, there will usually be opportunities to receive the Alexandra Palace transmissions. The receiver would also be suitable for receiving the American high-quality broadcasting, and police stations.

It would be interesting to design a receiver having variable selectivity ranging from that which is sufficient for good quality telephony down to that just broad enough for reasonable television reception, and with a tuning range of at least 60-28 Mc. and perhaps down to 20 Mc.

For the vision side, it is becoming less expensive than hitherto to provide a small cathode-ray tube with two flexible time base units and the necessary supply units. Numerous constructional designs have recently been published in the leading technical journals, many of which can be modified to suit the requirements of an experimenter. Furthermore, suitable components are on the market, although the average amateur interested in the construction of television gear will probably find that a very good deal of the material needed can be obtained from his junk box. As a general rule only a few of the key parts will have to be purchased. Once built the value of this equipment cannot be exaggerated, for the cathode-ray tube is the ideal instrument for many R.F. tests, whether in obtaining the best out of a receiver or in designing a transmitter. With its help one can settle once and for all questions regarding modulation, an important point to remember in these days when so many wrong impressions are given by those reporting on telephony transmissions.

Last year the Television Group inaugurated a letter budget but so far this season nothing has been heard from those members who we had anticipated would by now be busily engaged in television experiments.

It may be of interest to record the facilities which are now available to members of the Television Group. In the first place, a working arrangement has been reached with the Television Society whereby their Research Committee will co-operate in the exchange of information. As a result R.E.S. members can avail themselves, through the Group Manager, of all information to be found in the files of either organisation. Copies of catalogues issued by television manufacturers, and in many cases additional technical information, are available, together with data on valves, cathode-ray tubes, and special components used in television. Information is also on file concerning the B.B.C. transmitter, whilst it is probable that data on most other problems can be obtained quickly on request.

It is proposed to reorganise the records of the Television Society at an early date, in which case a file of television patent specifications and a very extensive index to literature and abstracts will also become available to Television Group members of R.E.S. In the meantime the Group Manager responsible for contemporary literature has prepared, in spite of ill-health, a comprehensive summary of television programmes in all countries of the world, and a summary of the technical features of all television receivers known to him, up to the present time. This information is also available for reference and is in the hands of the writer.

It is hoped that as a result of this article members interested in the experimental side of television will communicate with the author.

*Television Group Manager R.E.S.

Stray

We are advised by G5OV that Mr. T. Arnold, VU2AN, has changed his QRA to Zhob Signal Section, Loralai, Baluchistan, India.

THE 28 Mc. BAND

By Nelly Corry (G2YL)

CONGRATULATIONS to D. W. Heightman, G6DH, and T. A. Iserbyt, BRS25, who have been awarded the Powditch 28 Mc. Transmitting and Receiving Trophies for 1938. G6DH is still by far the most indefatigable worker on the band, and finds time to keep numerous graphs as well as to make DX contacts daily. BRS25 has probably done more listening on "Ten" than any other Receiving Station, as he started in October, 1928, kept it up through the lean years of sunspot minimum, and is still hard at it!

November started off with excellent conditions, but by the end of the month they had deteriorated considerably, DX signals being weaker and less consistent, and the band going dead comparatively early in the evenings. This corresponds exactly with conditions at the same time last year, and we shall probably have to wait till February before there is any definite improvement. During the month signals were heard from 46 different countries, and two new ones have been worked, both on 'phone, viz.: VP6YB, by G6LK on October 22 at 15.30 G.M.T., and YV5AK, by G6DH on November 19 at 09.30 G.M.T., and by G6YR on the 21. Ship stations now using 28 Mc. include OH3NQP, S.S. "Maria Thorden," trading between Finland and U.S.A., "W6BOY Mobile," bound for Florida from Newfoundland when last heard, and CZ7G, heard by G5BM giving his QRA as "Ship off Labrador."

Australian stations were heard throughout the month, and on November 1 G2XC worked 7 in succession. Those active included VK2ADE, 2GU, 2HZ, 2RA, 2TI, 2UD, 3CP, 3YP, 4RY, 4WH, 5FM, 5HG, 5KO, and 5YM; another signal from the same continental division was K6MVV, heard by G6DH. I am glad to say that I must take back my remarks about ZL inactivity last month, as BRS1173 heard ZL1HY on October 10, G2XC worked ZL2AL on October 30, and G6YL heard ZL2AL, ZL3AS, ZL3DJ at the end of October, and ZL3AB in November. G6DH worked ZL3AS at 09.30 G.M.T. on November 16.

In Asia the three active VU stations were joined by VU2FV, and other stations were J3FJ, worked by G2XC on November 14, PK3BM, worked by G2TK, G6CL and G6YL, and U9AV, U9ML in Siberia. African signals reported were FA3JY, FB8AA, FQ8A, ST2CM, ST2LR, ZE1JJ, ZE1JN, ZE1JR, ZE1JU, ZS1AH, ZS2N, ZS6AJ, ZT6AU, ZT6J, ZT6Y and ZU6E. Most of these only made spasmodic appearances in the afternoons, but it is probable that conditions were usually favourable for contacts during most of the hours of daylight, and on November 14 G2XC was QSO, FB8AA at 07.30 G.M.T.

South American stations included CP1AC, HI7G, OA4AW, OA4J, YV5AA, YV5AK, YV5HM, 5-PY's and 6-LU's. G5BM also heard a CE3 station, and G6WY has heard a genuine FY8, so there are now two more countries awaiting first G contact. From Central America and the West Indies 8 stations were heard in K4, K5/NY, TI, VP2 and XE. G5BD worked XE1CM on November 21, and on the same day G2TK received S9 from K4EJG. U.S.A. stations, with a preponderance of 'phones, were well heard throughout the month, and also VO1J and all VE districts. By the end of the month signals from the Western States had declined in number and QRK, but in the period November 1-10, G6LK worked 31 different W6 stations, and G2XC had W6 QSO's on 21 days out of 23 active. G6YR worked all W and VE districts, and G6DH worked W every day, and all W districts on 'phone.

Twin Feeders.

European activity is still at a high level, and signals from 20 different countries were heard during the month. Stations at distances from 50 to 350 miles were received regularly, particularly in the mornings, and echos on G's have again made their appearance. On November 28 G6DH's signals had a heavy echo at G2XC (QRB 120 miles), but this disappeared when G6DH changed his transmitting aerial. On another morning G2KU and G2MV (QRB only ½ a mile), reported each other's 'phone as marred by "high speed flutter," and when G2MV changed to c.w. a very pronounced echo was heard.

During the month G6DH was W.A.C. and W.B.E., G6LK was W.A.C. on 'phone, G6YR completed his W.A.C., and G8CV made his final contact for W.A.C. and W.B.E. by raising VK2GU on 'phone. The best performer of the month, however, was G2TK, who was W.A.C. in 1½ hours on November 14. Many thanks to the 12 stations whose reports were much appreciated.

The R.S.G.B. QSL Bureau

DURING recent months several important changes have occurred in regard to the handling of listeners' reports, therefore, to clarify the position, we publish below an up-to-date description of the functions and uses of the Society's QSL Bureau.

Reprints of this information will be sent to all new members on election.

We wish once again to draw specific attention to the question of unclaimed cards. At the commencement of 1937 a new scheme was tried out which has proved very successful. Under this arrangement an amateur is advised by Headquarters that he has a batch of cards awaiting collection, and is given 14 days in which to forward envelopes. If no reply is received after that period has elapsed it is assumed they are not required, and the cards are disposed of at the discretion of Headquarters.

An Explanation of the Functions and Uses of the QSL Bureau.

The full use of the Bureau is reserved exclusively to members of the Radio Society of Great Britain, but non-members resident in the British Isles may collect cards addressed to them by *call sign*, provided stamped addressed envelopes are kept at the Headquarters of the Society.

The Bureau gives to members a two-fold service. In the first place it forwards to British Isles members cards received from other amateur organisations or individuals; secondly, it accepts from members their cards for distribution, subject to certain reservations mentioned later.

All who make use of the Bureau are deemed to have accepted and agreed to the procedure which has been approved by the Council.

The methods adopted in handling cards are described below.

Cards for You.

If you wish to collect your cards, stamped and addressed envelopes must be kept at the Bureau. It is a good practice to number your envelopes conspicuously on the back, and when the last one has been returned, forward a new batch *at once*. Remember, if you have no envelopes, congestion will occur—congestion reduces the efficiency of the service.

Do not send more than six envelopes at any one time, and use a standard size manilla, 7 in. by 5 in. Large and very small envelopes are difficult to handle.

Write your call sign clearly in block letters in the *left hand top corner* of the envelope. This enables the staff to locate your envelope promptly.

The Bureau cannot undertake to despatch definite quantities of cards in any one envelope, but as a general rule no envelope is sent unless it contains three or more cards. Every endeavour is made to clear the files fortnightly.

Overseas members of the R.S.G.B. may not collect their cards direct from the Bureau, except in cases where no Bureau exists in their country.

Members who do not wish to go to the trouble of preparing their own envelopes, may procure them from the Bureau already addressed and stamped to the value of 1½d. at a price of 2d. per envelope.

If you have no envelopes you will be advised that cards are waiting collection. If no reply is received within fourteen days it will be assumed that you do not wish to claim them. After that time they will be disposed of at the discretion of the Society.

Cards from You.

If you are a fully-licensed transmitting member resident in Great Britain, the Society will accept any card providing it refers to an actual QSO. Acknowledgments of listeners reports on your transmissions can only be accepted if they are addressed to a person holding a B.R.S., B.E.R.S., or similar listener identification number. Cards addressed to individuals by name and address only cannot be accepted.

* * *

If you are a non-transmitter resident in Great Britain the Bureau cannot accept report cards which refer to the reception of signals from W, K4, 5, 6, 7, VE and VO (as the respective Bureaux decline to handle them), neither can reports addressed to European amateurs be accepted unless they refer specifically to the reception of 1.7, 28 and 56 Mc. amateur signals.

Cards relating to the reception of Broadcast or Commercial stations cannot be accepted.

* * *

Overseas members resident in countries where a QSL Bureau exists should send cards for all amateurs to their Bureau, but the R.S.G.B. Bureau is willing to accept direct, cards addressed to British Isles amateurs including non-transmitters.

* * *

Those using the Bureau are strongly urged to employ QSL cards of standard postcard size (5½ in. by 3½ in.). Frequently large cards are received which cannot be accommodated, without bending; such cards frequently have to be doubled in half to fit them into envelopes.

To facilitate the work of the Bureau, members are urged to send their cards in *reasonable* quantities. In no instance should more than 50 cards be sent in one batch.

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.

It will assist the Bureau if all cards for a specific country are sorted before despatch. Each small batch can then be promptly handled.

Photographs must be pasted on the reverse side of the card.

Members who wish to send a card to an amateur in a country where no Bureau exists or where very few other amateur stations are active are advised to forward such cards direct. In the past, members working or reporting such a station have sent the card to the R.S.G.B. Bureau where it has been held for some weeks in anticipation of further cards arriving for the same station.

Letters for overseas amateurs cannot be accepted for distribution as they are not permitted under the postal rate at which the cards are despatched.

Remember Congestion Causes Confusion—Keep envelopes at the Bureau

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

Address the packet to QSL Bureau, R.S.G.B., 53, Victoria Street, London, S.W.1.

BOOK REVIEWS

RADIO ENGINEERING. By F. E. Terman, Sc.D., Professor of Electrical Engineering, Stanford University. Second Edition. 813 pages and 474 illustrations. Published by McGraw-Hill Publishing Co., Ltd., Aldwych House, London. Price 30s. net.

In the review of the first edition of this book, the writer said : " It is rarely that a book of such merit appears, and the reviewer would be failing in his duty to readers if he did not emphasise very decidely its practical value to radio experimenters." That opinion has since been confirmed by many students of radio engineering to whom the book has been recommended, and by conversations with professional radio engineers.

Perhaps the most outstanding feature of the book is the engineering flavour shown throughout. It is a book for engineers, and the average one regards mathematical manipulations as a means and not an end. Nor does the engineer expect to find the rudiments of a subject in a book on a specialised section of the work. So the reader is expected to bring to the book a good working knowledge of alternating currents and vector representation.

Though only a few years old, the book has been entirely revised in the second edition to bring it up to date. More than half the illustrations are new, and the presentation of the subject has been modified in many places.

The treatment of power amplifiers has been greatly expanded, and the author claims that their treatment is the most complete available in book form.

Measurements have been omitted in favour of a short chapter on television, and this would seem a reasonable step as measurements deserve a book to themselves.

The analysis of distortion in amplifiers by the power-series method, and the explanation of equivalent circuits to simplify the application, is a valuable extension.

More attention is given to the qualitative side of propagation, especially in regard to calculation of range and field-strength, and ultra-high frequencies are included. This chapter, alone, would merit the attention of all interested in propagation experiments.

A considerable amount of new material is presented in this edition. Readers will welcome the treatment of radiation from non-resonant wires, leading as it does to the rhomboid type of directional aerial which has aroused so much amateur interest. Another interesting and new section deals with condenser-input filters, and yet another with universal amplification curves of resistance- and transformer-coupled amplifiers. An explanation is also given of the Doherty arrangement for a high-efficiency linear amplifier.

Multitudinous references are given in the form of footnotes, and problems are supplied at the end of each chapter. The problems are of such a nature as to be most useful to those studying with the help of an instructor. No solutions are given and indeed they are not all of the type to which solutions may usefully be presented in the book.

The writer most confidently commends this edition to the notice of all readers as a book of outstanding merit in the field of radio-engineering, and one which the keen engineer will value.

T. P. A.

Trade Notes

Stentorian Loudspeaker, Model 38S. The Stentorian Model 38S is a permanent magnet loudspeaker equipped with a multi-ratio transformer manufactured by *Messrs. Whiteley Electrical Radio Co., Ltd.*

The loudspeaker is fitted with a substantial permanent magnet, an approximately 1 inch diameter speech coil having an impedance of 2.25 ohms and a straight-sided 8-inch diameter cone. The coil is centred by an outside centring device and has small additional damping by a cotton wool pad in front of the speech coil. The output transformer is of reasonable dimensions and is arranged for various impedances selected by taps set as required by two switches fitted to the back of the housing. Terminals are provided for push-pull or single-ended operation, also for an external volume control. The weight of the complete chassis model is 8½ lbs. The impedances are arranged to give a plate-to-plate load for push-pull or an anode load of the following values : 70,000, 50,000, 34,000, 22,000, 15,000, 10,600, 7,200, 4,800 and 3,250 ohms, and as a low resistance extension speaker the following values : 22, 15.5, 10.5, 7, 4.75, 3.25, 2.25, 1.5 and 1 ohm.

Full instructions for setting the switches and all other details are given in a folder enclosed with the loudspeaker.

A check made indicated that the impedances quoted are near enough accurate for all practical purposes and no point would be served by quoting the actual measured values.

The loudspeaker tested under practical conditions using an output stage capable of about 10-15 watts undistorted output and a receiver having a flat response between 20 cycles and 12,000 cycles gave a very pleasing reproduction ; there was no evident bass resonance and very little colouration in the top register. The response appeared to extend to about 8,000 cycles giving quite natural speech and the loudspeaker handled

its rated maximum of 5 watts without any indication of distress or rattle. The sensitivity was above the average for its type and size.

The 38S Stentorian can be thoroughly recommended to members for use on receivers or as an extension speaker and represents good value for its reasonable price of 42s.

D. N. C.

Webb's Radio Globe and Map

The enterprising firm of *Webb's Radio*, 14, Soho Street, London, have fulfilled a long felt want by producing at no little expense two valuable adjuncts to the equipment of an Amateur Radio station. The first is a Globe specially prepared by the well-known Cartographers, *Geo. Philip & Son, Ltd.*, the second a Great Circle map of the world centred on London.

The Globe

The Globe, printed in full colours, has a diameter of 12 inches and shows the W.A.C. and W.B.E. boundaries, and the amateur prefix used in each country.

A time disc is fitted at the top to permit the user to ascertain the time in any part of the globe at a glance. An interesting device is the inclusion of Analema showing the declination of the sun for every day in the year, and the equation of time.

The Globe is highly finished and, as will be seen from the illustration, is clearly printed in every detail.

The Globe, which is packed in a special container permitting easy transport, is available from Headquarters, price 27s. 6d. post free.

The Map

For the British Isles and near European amateur the new Webb's Radio Map provides the answer to a long expressed wish for a great circle map of good size centred on London. The modified Azimuthal Projection is used, and the following special features will have an instant appeal to the amateur interested in aerial tests and long distance work :—

1. The size is 30 in. by 40 in.
2. The map is in colours and printed on good quality paper.
3. The prefix used by amateurs in each country is clearly shown in a contrasting colour.
4. The Continental divisions used for basing W.A.C. and W.B.E. claims are shown in contrasting colours.
5. The scale is 1,000 kilometres to the inch.
6. The perimeter is divided into degrees.
7. A very complete and up-to-date list of Amateur Prefixes is included.
8. International time zones are shown.
9. The price is right.

The map is now available from R.S.G.B. Sales Dept., price 4s. 6d. post free.

We can confidentially recommend both of these items to our members who, if in town, can examine them in detail at Society Headquarters.

We congratulate Webb's Radio upon producing such useful Ham companions at just the right time.

Christmas is coming !

DX Tests on 3.5 Mc.

Mr. P. Pennell (G2PL) has asked us to give publicity to a series of DX tests on 3.5 Mc. which are intended to produce contacts with South Africa and the Far East.

The tests will take place over the five week-ends in January, 1938, and will run from 19.00 to 23.00 G.M.T. each Saturday and Sunday.

There will be no restrictions on calling or transmitting periods, but South African and Far East stations should, where possible, keep within the band 3,500-3,530 kc. British Isles amateurs taking part in the test are urged to work between 3,530 and 3,600 kc.

All reports should be sent to Mr. Pennell, 52, Gilbert Road, Cambridge.

A SILENT KEY.

It is with very deep regret that we have to record the passing on November 17 at an early age of Mr. R. F. Loomes (G6RL), of Croydon, Surrey.

G6RL was well known to many members either over the air or through visits to his radio shop in Earl's Court, London. He was an ardent experimenter from about 1919, and his whole life for many years was devoted almost entirely to radio. He obtained his transmitting licence in 1930, and from then until 1936 his call became well known all over the world. Unfortunately illness prevented him carrying on with his experiments during the past year. He will be missed by many London and provincial members who were wont to call and see him on their way to Olympia each year.

Our deepest sympathies are extended to his relatives and many friends, and in particular to his wife and daughter.

G6US.

Accumulator Manufacture

THE manufacture of modern storage cells presents problems little known or understood outside the circle of those whose task it is to produce them. Recently the opportunity occurred to visit the works of the *Chloride Company, Manchester*, the largest accumulator factory in the British Empire.

Until one has studied manufacture at first hand, it is impossible to visualise the immense organisation involved in the production of storage batteries. Purity of materials is the keynote of the business, most meticulous care being taken at every stage to ensure that nothing but the finest quality of raw material is used.

The Moulding Department holds a particular fascination, the antimonial lead being formed into familiar shapes in the twinkling of an eye. One of the most interesting machines in this department is that used for making the rosettes for the grids of type R. chloride plates. This machine, fed from a continuous roll of lead tape automatically gimps, cuts and rolls tape into the desired formation at the rate of 120 rosettes per minute.

In the Slitting Department batteries of machines slit the ebonite tubes used in ironclad plates. The filling of these tubes with dry material by means of shaking machines presents one of the greatest problems in accumulator manufacture, for it is essential that the operators be isolated from the deleterious effects of the dust. Hooded booths and specially designed respirators are employed here and in other departments where exposure to lead dust may occur.

The Plate Pasting Department is arranged with suction exhausts, whilst the floors are kept flooded to avoid rising dust. Both hand and automatic pasting methods are employed, the former for the larger capacity plates, such as those used for submarine batteries ; and automatic pasting for smaller batteries of the radio type.

In the Forming Department plates are suspended in dilute sulphuric from three to seven days, the process being known as electro-chemical forming.

The Assembly room, with its conveyor belt, is one of the most interesting of all the departments. Starter and radio batteries are assembled and tested without a break in continuity of production.

The Celluloid Department, isolated because of fire risks from all other buildings, deals with the sealing, by means of a special compound, of the smaller types of batteries, as used for aircraft, portable wireless sets and hand lamps. Special apparatus is employed to test the containers for leakage.

The making of wood separators, wood cases and battery boxes is undertaken in a well-lighted and excellently ventilated Joiners' Shop, an interesting feature of which is the employment of underground shafting, and an exhaust system which extracts the sawdust straight to the boilers. The wood separators are treated in alkaline solution to remove resinous matter, and injurious acids.

The radio amateur accustomed to small accumulators for domestic use would stand amazed in the Submarine Department, where banks of cells extending in length for 150 yds., and weighing up to half a ton each cell, are on test for submarine purposes.

The importance of safeguarding the health and safety of employees is in evidence throughout the *Chloride* organisation. In addition to a resident doctor and his staff, a visiting dentist is employed to deal with dental troubles. Blood tests are frequently taken, and it speaks volumes for the efficiency of the medical supervision that no single case of lead poisoning has been recorded for the past seven years.

Having watched the care taken in production, it is easy to see why the *Chloride Company* claim that their batteries are the best in the world.

J. C.

"Wireless World" Valve Data Supplement

Wireless World receive our congratulations for once again producing their Annual Valve Data Supplement. Every year since 1927 our valued contemporary has filled an urgent need by presenting full details of almost every known type of valve.

The 1937 supplement appeared with the issue dated November 25 and it is particularly interesting to note that details are given of over 900 different valves, including a number of American types.

To the keen radio amateur the need for such information is obvious, but we believe that *Wireless World* would be doing an even greater service if they could produce the supplement as a loose insert for all-the-year-round reference. Periodicals have such an uncanny knack of being mislaid when most urgently required !

We recommend members who have not obtained this invaluable issue of *Wireless World* to take time by the forelock and order a copy immediately.

Golders Green and Hendon Radio Society Activities

Lieut.-Col. H. Ashley Scarlett has forwarded details of 1938 fixtures arranged by his Society.

Jan. 8—Visit to G.E. Co. Research Laboratories, Wembley, 2 p.m.
,, 13—Lecture and Demonstration "Quality Reproduction," by Mr. P. K. Turner, B.Sc.
,, 27—Lecture, "Measuring Apparatus for Amateurs," by Mr. J. C. Emerson, B.Sc.
Feb. 5—Visit to Broadcasting House, 2 p.m., followed in the evening by Annual Club Dinner.

R.S.G.B. members who wish to attend the visits on January 8 and February 5 should send a stamped and addressed envelope to Lieut.-Col. Scarlett, 60, Pattison Road, N.W.2.

The lectures which are held at the Regal Cinema, Finchley Road, N.W.2, commence at 8.30 p.m.

To The Editor

HARMONIC SUPPRESSION

To the Editor, T. & R. Bulletin.

Dear Sir,—The article on Harmonic Suppression by GM6RG seems at once essentially a practical and easily adjusted method. Mr. Groom, however, is not quite decided on its method of action. A similar circuit adaptation of harmonic suppression was described by Y. Kusunose in a paper on "Elimination of Harmonics in Transmitters," in the Proc. I.R.E. for February, 1932. The view taken by this author is that "the harmonics in the plate circuit are much stronger than those in the inductive leg of a resonant circuit inserted, and the latter can therefore be balanced out by the former, utilising a suitable coupling between the two circuits."

Two circuits are given, the second of which consists of a small inductance in series between the plate and tank circuit and inductively coupled to the latter. Adjustment is by tapping along this coil. It seems, since the coupling required is negative in this case, that the tapping could be made along the tank coil, which brings us to Mr. Groom's arrangement. The equation for this balance is given as

$$\frac{M}{L} = -\frac{1}{n^2}$$

where M = mutual inductance between plate and tank circuits, L = tank inductance, and n is the order of harmonic to be eliminated.

Although the paper is somewhat brief, I feel a reference to it would help in understanding the function of the circuit. A number of measurements made on a broadcasting transmitter leave no doubt as to the efficacy of the method.

Finally, many thanks to Mr. Groom for his opportune and useful article.

Yours faithfully,
L. E. Newnham, B.Sc. (G6NZ).

DIRECT SOUND RECORDING

To the Editor, T. & R. Bulletin.

Dear Sir,—Further to Mr. Donald Aldous' letter in The T. & T. Bulletin for November, 1937, with regard to Direct Sound Recording for Amateurs; may I suggest that those who are interested in the use of records for the repetition of telephony or telegraphy test calls, etc., should communicate with Disc Recording, Ltd., of 179, Station Road, Edgware. (Telephone : EDGware 4110), who market seven-inch double-sided recordings, on a glass base, at an inclusive cost of, I believe, four shillings and sixpence.

The playing time of these records is approximately 1¼ minutes per side, and the recording is supervised by Mr. H. Andrewes (Ex G2TA), who has had considerable experience in Amateur Radio, as well as, Sound Recording, work. The records have the usual low level of surface noise associated with directly recorded discs, and their life compares very favourably with that of an ordinary commercial pressing.

Yours faithfully,
B. Youngman (2BOY).

"NATAL MERCURY" CONTEST

To the Editor, T. & R. Bulletin.

Dear Sir,—The "Natal Mercury" (one of the largest South African newspapers) has been extremely generous in running what will be known as the "Natal Mercury" Radio Competition for the benefit of radio amateurs in South Africa. An entrance fee will be charged for each entry from B.C. listeners, and the funds which accrue therefrom are to be donated to the S.A.R.R.L. for the purpose of purchasing requirements necessary in their combined experimental work.

This paper is pleased to announce that "the object of the competition is to obtain funds to enable the S.A.R.R.L. to continue its invaluable work of technical radio development and research in South Africa." The paper is offering a prize of £15 to the entrant who submits the greatest number of verification cards, and £5 for the second greatest number of cards received.

The competition commenced midnight November 30, and closes midnight December 31, 1937, and is open to all listeners, but not licensed amateurs. All verification cards must be handed to the Radio Editor, "Natal Mercury," before 9 a.m. on March 1, 1938.

Our object in communicating with you is to make the earnest request that you publish in your journal, at the earliest opportunity, what this paper is doing for the amateur in South Africa, and to make a particular appeal to amateurs throughout the world to help along this excellent cause by sending the QSL Cards confirming reports received from B.C. listeners who head their reports "Natal Mercury" Radio Competition.

We realise that a certain amount of expense will be attached to sending these cards, but here again you may be of valuable assistance to the scheme if you will be good enough to act on this occasion as a QSL Bureau for collecting amateurs' cards and sending them to the "Secretary, S.A.R.R.L., P.O. Box 49, Durban." If each packet is labelled "Natal Mercury" Radio Competition it will assist clerical work at this end.

We would willingly refund to you postal charges incurred in sending these cards in batches to us.

May we count on your support ?

With best 73's.

Yours faithfully,
For South African Radio Relay League,
W. R. Thomas,
Headquarters Secretary.

Re 1.7 and 3.5 Mc.

To the Editor, T. & R. Bulletin.

Dear Sir,—Perhaps you will allow me, having started a discussion about 7 Mc., to raise some points about the 1.7 and 3.5 Mc. bands.

It is always being urged that more use should be made of the low-frequency bands, and particularly

that local telephony contacts should be confined to these frequencies (and, of course, 56 Mc.). I would like to set down, as they appear to me, some of the reasons why this excellent advice is not generally followed.

(1) B.C.L. interference by transmissions on 1.7 and 3.5 Mc. is particularly troublesome, and this alone must keep literally hundreds of stations off these frequencies.

(2) Half-wave aerials for these bands are too long for the convenience of the average amateur. The effectiveness of other types is often overlooked.

(3) The necessity for special licence for the use of these bands is an initial obstacle which has a deterrent effect.

(4) Band changing is (apparently) a lengthy and tiresome business at the average station, and it must be remembered that many high-frequency transmitters cannot give a proper L/C ratio for telephony on the lower frequencies.

(5) The 3.5 Mc. band, in particular, has a reputation for noisiness. In view of the enormous signal strengths that can obtain at times to offset this noise, this reputation seems rather undeserved.

(6) The ranges covered by these frequencies will not permit experimenters at certain distances to communicate at suitable times, though the 7 Mc. band will so permit.

(7) Owing to the relative unpopularity of these bands, many amateur receivers will not tune to them: this is, in itself, a deterrent to the use of the band. (A good example of such an effect is, or was, on the 28 Mc. band when receivers did not tune above 17 Mc.)

My own belief is that the first reason mentioned above has more effect than the last six, in keeping little used the 1.7 and 3.5 Mc. bands.

Yours truly,
K. Morton Evans (GW5KJ).

THE POWER QUESTION.

To the Editor of T. & R. Bulletin.

Dear Sir,—I read with much interest the statement made by Mr. H. A. M. Whyte (G6WY), in his November "Month on the Air" article, that 350 volts on the plate of a transmitting valve represents a full 10 watts input when the load is correctly adjusted. Whilst I should hesitate to argue with such an experienced amateur that his statement may not generally be true in practice, I cannot help thinking that it is not quite as scientifically correct as he would have us believe!

I know of no sound reason why the power input to a valve should be exactly determined by the anode voltage applied, and as there are probably others similarly puzzled by this point of view, I should appreciate further enlightenment in a future issue of the Bulletin.

If I increase the high tension on a 10-watt P.A. stage to, say, 1,000 volts and then bias it class B or C to a value well below anode cut-off (yes, Mr. Davin—Class B stages really *do* need grid bias!), it will be possible by adjusting the drive to read a mean anode current of 10 mA. Surely Mr. Whyte would not contend that my input then was above 10 watts? In general, I prefer to use rather high values of anode voltage and rather low currents as it suits the gear in use. Such an arrangement favours low-level modulation of a Class B linear amplifier.

Of course the example quoted is an exaggerated case, but in my opinion it is stretching a point to infer that voltages above 350 necessarily imply that the input is above 10 watts.

If reducing my anode voltage to 350 will enable me to work some of the DX described in "The Month on the Air" column, then I should be one of the first to adopt the practice!

Yours faithfully,
E. L. Gardiner (G6GR).

MULTIPLE QSOs

To the Editor, T. & R. Bulletin.

Dear Sir,—With the idea of reducing the terrible QRM which takes place on the 7 Mc. band, especially at week-ends, may I put forward the suggestion that stations where possible should try and work others around their own frequency, and get a multiple QSO running?

It has been carried into practice during recent week-ends, having been started by G5YV, G8TH and G5FA, who operate within a few kc. of one another (around 7,070 kc.), the idea being that as soon as another station comes on this frequency or, say, in a band width of 15 or 20 kc. calling test, he is called by one of the group stations and invited to join in a multiple QSO. The first two week-ends it was given a trial four or five stations took part, and it was quite successful. On the third Sunday afternoon it developed into a 9-way QSO, with G8TH, G5YV, G8TY, G2AK, G8TG, G8LU, G8KW, GW5TJ and G5FA. All stations with the exception of one, were working on or near the same frequency, and had they been trying to work individually the QRM may well be imagined; as it was, each station obtained reports from eight others 100 per cent. The input power of the stations taking part ranged from 5 to 100 watts.

If this could be tried out on various parts of the band it would give the QRP man a chance of obtaining reports, which at present it is practically impossible to do. Not only that, but reports on tests can be obtained from a number of stations from various parts whilst conditions are more or less the same.

Yours truly,
P. R. Solder (G5FA).

STATE YOUR FREQUENCY?

To the Editor, T. & R. Bulletin.

Dear Sir,—May I be allowed space to appeal to all British 'phone operators to state their exact frequency when calling "Test"? If this is done it will assist many of us, who are continually altering our receivers, to re-calibrate them from direct observations.

I should like to thank you for publishing "The Helping Hand" articles, which are particularly appreciated by the B.R.S. members who, like myself, hope one day to hold a G call.

Yours faithfully,
George Oxton (BRS2207).

BETWEEN OURSELVES

Presentation to Mr. E. D. Ostermeyer

It is felt that his many friends in the Society will wish to be associated with the Council in a presentation to our retiring President.

Mr. Ostermeyer has held executive office since 1929, having served as Hon. Treasurer from that year until 1936, and as Executive Vice-President for three years prior to his succession to the Presidential Chair.

The value of his services to the Society cannot be under-estimated.

Donations should be addressed to :

Mr. A. D. Gay,
Hon. Treasurer
R.S.G.B.
53, Victoria Street,
London, S.W.1,

and should reach him not later than December 24.

Christmas Holidays

Headquarters will be closed from midday, December 24, until 10 a.m. December 28.

Members requiring Sales Department material for Christmas are asked to place their orders as early as possible to avoid delay in delivery.

Old Timers' Dinner

Up to the time of going to press, about 50 members had expressed a desire to attend the proposed Old Timers' Dinner. We feel sure this figure does not by any means represent the number who really wish to be present, therefore, we make this last appeal to all who were holding a licence on January 1, 1928, to send a postcard to Headquarters *at once*.

The dinner will take place in London, probably on Saturday, January 22, but a definite announcement will appear in our next issue. All who have signified their intention to be present will be informed by circular of final arrangements.

The Powditch Trophies

Council have much pleasure in announcing that Mr. D. W. Heightman, G6DH, has for the second year in succession been awarded the Powditch Transmitting Trophy for his consistent 28 Mc. experimental work.

For the first time since 1930, the Powditch Receiving Trophy has been awarded. The holder, Mr. T. A. F. Iserbyt, BRS25, has for many years been Group Centre of one of the 28 Mc. Propagation Groups, and Council, in making the award, desired to mark their appreciation of his work in this and other spheres of 28 Mc. activity.

B.E.R.U. Junior Contest

Members possessing 10 watt permits who wish to be recommended for the use of 25 watts during the B.E.R.U. Contests in February are requested to make an application to the Secretary not later than January 8, 1938.

No application can be considered after the above date.

B.E.R.U. Contest Entry Form.

Members and entrants resident in countries outside the British Isles, New Zealand, and Australia, are asked to note that on the official entry form, circulated in our last issue, ZL1, 2, 3, 4 should be shown divided into two separate zones, viz. :

ZL1, 2	See Note 5	
ZL3, 4		

G.P.O. Licence Matters

Members requiring 3.5 Mc., 25 watts, or high-power permits, should in their own interests study either the *Guide* or past issues of this journal, containing advice on these matters.

On at least six occasions recently, members have written to the Council asking them to obtain extra licence facilities after they have had their direct applications turned down by the G.P.O.

We wish to state that Council cannot deal with an application for additional facilities, if the G.P.O. have previously refused the application.

Channel Isles

Council have been pleased to appoint Mr. J. Dowding, G8DO, as Channel Islands Representative. Local applications for increased licence facilities, and notes for this journal should be forwarded to Mr. Dowding, 5, Well Road, St. Peter's Port, Guernsey.

QSL Postage Rates

Capt. S. Thorpe, ZS1AH, asks us to point out that under the new postal scheme; all postcards and letters are sent from England to South Africa by air at a flat rate of 1½d. per ½ oz. Unfortunately certain British amateurs have sent letters weighing *over* ½ oz., with the result that a surcharge has been demanded on delivery.

Newmarket

Arrangements have been made by the D.R.'s concerned to include the town of Newmarket in District 8 (Home Counties) instead of District 9. Reports should be sent either to Mr. Jeapes or to the T.R.

A.R.R.L. Handbooks

Supplies of the new (1938) edition of the A.R.R.L. Handbook are now available at standard prices.

In addition we have small stocks of the 1937 "Radio" Handbooks and the Autumn issue of the Call Book.

The E.R.S.E.

We have been officially informed that the Experimental Radio Society of Egypt is now in active operation under the presidency of Mr. W. E. Marsh, SU1WM. The Honorary President is H.H. Prince Abdul Moneim, SU1AM, whilst the following additional officers have been elected to serve on the Council: Vice-President, Mr. E. M. Chorlian, SU1CH; Secretary, Mr. G. Moens, SU1RO; Treasurer, Mr. J. Thomas, SU5NK; QSL Manager, Mr. F. H. Pettitt, SU1SG. Members: Messrs. Wimbush, SU2TW, Hochstein SU1AX, and Disteche, SU1RD.

The first number of the Society's publication, *Erse*, has appeared under the editorship of Mr. F. H. Pettitt.

The new Egyptian society has applied for membership in the I.A.R.U.

The Council of the R.S.G.B. have on behalf of members offered congratulations to the new society.

Town Representatives, 1938

Up to the time of going to press T.R. nominations had been received on behalf of the following members :—

District 1 :
- Birkenhead ... Mr. G. Russell-Lee (G6GL).
- Blackburn ... Mr. A. Tomlinson (G2QN).
- Bury ... ... Mr. T. C. Platt (G2GA).
- Liverpool ... Mr. J. Davies (G2OA).

Distraict 2 :
- Halifax ... Mr. J. S. Kilpatrick (G5QS).
- Sheffield ... Mr. A. Pemberton (G2JY).

District 3 :
- Birmingham ... Mr. G. Brown (G5BJ).
- Coventry ... Mr. L. W. Gardner (G5GR).
- Shrewsbury and District ... Mr. E. R. Westlake (G6KR).

District 4 :
- Mansfield ... Dr. E. S. G. Vance (G8SA).
- Mapperley ... Mr. F. H. Spencer (2ARN).
- *Northants. ... Mr. L. F. S. Parker (G5LP).
- Worksop and Retford ... Mr. H. S. Chadwick (G8ON).

District 5 :
- Bristol ... Mr. R. E. Griffin (G5UH).

District 7 :
- Oxford ... Mr. H. J. Long (G5LO).
- Portsmouth ... Mr. L. E. Newnham (G6NZ).
- Reigate ... Mr. L. G. Knight (G5LK).

District 8 :
- Bedford ... Mr. H. Jeakings (2AWH).
- Cambridge ... Mr. L. W. Jones (G5JO).
- Peterborough Mr. W. Carter (G2NJ).
- St. Ives ... Mr. C. D. Whaley (G6WA).

District 9 :
- Ipswich ... Mr. S. G. Keeble (G2AN).

District 10 :
- Cardiff ... Mr. H. H. Phillips (2BQB).
- Newport ... Mr. R. V. Allbright (G2JL).

District 12 :
- London, N. ... Mr. L. Gregory (G2AI).
- Watford ... Mr. P. G. Spencer (G8MH).

District 15 :
- High Wycombe Mr. V. O. Hawkins (2BVX).
- N.W. Middlesex Mr. J. Hearne (G8MA).
- West London Mr. H. B. Crowe (G6CO).

District 16 :
- Brighton ... Mr. C. F. Barnard (G8AC).
- Gravesend ... Mr. R. S. Martin (G2IZ).
- Whitstable ... Mr. W. Crosland (G5CI).

District 17 :
- Boston ... Mr. G. Hutson (G6GH).

District 18 :
- Hull ... ... Mr. A. Bell (G2XA).

* Mr. Parker is temporarily acting as representative for the county of Northants.

Messrs. S. Johnson, GI5SJ, and J. Jensen, BRS3012, have been nominated for the position of Belfast T.R. Members living in this town or within a radius of 10 miles are requested to record a vote on the ballot form which appears below, on behalf of one of these nominees. Mr. Johnson is the present T.R.

Headquarters cannot take note of T.R. nominations unless sent in on the presecribed form, or a copy thereof. Numerous T.R.'s have, according to District Notes, been appointed but no official notification has been received.

We would ask D.R.'s to study the above list and where omissions occur arrange for a nomination to be submitted.

Ballot Form

T.R. Elections, 1938.

The Secretary, R.S.G.B.,
53, Victoria Street,
London, S.W.1.

I wish to record my vote in favour of Mr..... as Town Representative for Belfast.

Signed..... Call sign.....

Voting form to be returned not later than December 31, 1937. A copy of this form may be used.

QRA Section

Manager: H. A. M. Whyte (G6WY).

New QRA's

G2BM.—G. R. Foster, 3, Bromley Mount, Sandal, Wakefield, Yorks.
G2CF.—W. A. D. Howes, Curlew Point, Charleton, near Kingsbridge, Devon.
G2FS.—L. K. Winsor, "Highmore," Hillcrest Avenue, Hessle, Yorks.
G2HI.—Eric Williams, 17, Courthope Road, Wimbledon Common, London, S.W.19.
G2JD.—L. H. Peplar, 162, Sidegate Lane, Ipswich, Suffolk.
G2JI.—G. Keyworth, 181, Westwick Road, Sheffield, Yorks.
G2OV.—F. F. Bolton, "Glenhaven," Studley Road, Redditch, Worcs.
G2PW.—T. E. Asher, 150, Boulton Road, Handsworth, Birmingham.
G2UP.—W. G. Money, 48, Hilton Avenue, Hall Green, Birmingham, 28.
GM2ZN.—David Joseph, 26, Blinkbonny Road, Edinburgh, 4, Scotland.
G3AD.—A. N. Simmons, 69, Chester Terrace, Chester Square, Westminster, London, S.W.1.
GI5DX.—E. J. G. Tucker, Greenloaning, Craigavad, Co. Down, N.I.
G5JR.—R. Buckstone, 90, Pams Way, Ewell, Surrey.
GM5KQ.—J. Fraser, Dalknock, Crieff, Perthshire, Scotland.
G5LJ.—W. J. Butler, "Walcot," 32, Pilkington Avenue, Sutton Coldfield, Warks.
G5LL.—A. H. Lunn, Station House, L.N.E.R., Mablethorpe, Lincs.

G5TS.—T. Brian Smith, 38, Great Thrift, Pettswood, Kent.
G5YO.—J. Reid, "Norham," Milton Avenue, South Shields, Durham. (Reported incorrectly as G5YQ in October Bulletin.)
G5ZQ.—W. G. Brigstocke, 29, Walmsley Road, Broadstairs, Kent.
G6CY.—A. S. Clacy, "Winwood," 380, Portland Road, Hove, 3, Sussex.
G6DT.—R. T. Dealey, 34, E. Sheen Avenue, London, S.W.14, and at "Woodville," Drillhall Road, Horndean, Hants.
G6FI.—F. G. Ingleton, 36, Pavilion Gardens, Staines, Middlesex.
GM6JJ.—Wm. N. Craig, 8, Craigholm Crescent, Burntisland, Fife, Scotland.
G6OG.—(Ex AP9FRG), F. Gee, 10, Kensington Avenue, Penwortham, Preston, Lancs.
G6PO.—H. Hillgrove, 415, Crompton Way, Tonge Moor, Bolton, Lancs.
G6QF.—W. K. Miller, 37, Bee Fold Lane, Atherton, Lancs.
G6QZ.—A. G. Parker, 84, Cecil Road, Norwich, Norfolk.
G6RF.—D. E. Herbert, "Delverne," Hill Lane, Hartley, Plymouth, Devon.
G6UC.—Thos. Kennedy, 22-24, Main Street, Spittal, Berwick-on-Tweed.
G6WI.—R. J. Crutchley, 3, The Cottages, Beacon Hill, Rubery, near Birmingham, Worcs.
G6XG.—J. Nelson, 283, Dodworth Road, Barnsley, Yorks.
G8AP.—E. H. Pawson, "Beru," Scawby Brook, Brigg, Lincs.
G8AX.—T. C. R. Littlemore, The Gables, Mattishall, Dereham, Norfolk.
G8GS.—C. W. Farrell, Hut 88, "A" Squadron, No. 1 Wing, E. & W. School, R.A.F., Cranwell, Lincs.
GM8LS.—A. J. Ellis, c/o 76, White Street, Glasgow, W.1, Scotland.
G8MF.—T. de Putron, junr., "Beverley," Les Hubits, St. Martins, Guernsey, C.I.
G8SN.—J. F. Barlow, 24, Sandriggs, Cockerton, Darlington.
GM8TT.—G. L. P. Zech, Temple House, Baldernock (via Torrance), Stirlingshire.
G8TX.—T. R. White, 49, Lawrence Avenue, New Malden, Surrey.
G8UK.—J. Turnbull, 12, The Avenue, Monkseaton, Northumberland. (Reported incorrectly in November Bulletin.)
G8UL.—J. M. Abbott, 48, Sunny Bank, Hymers Avenue, Hull, Yorks.
G8UO.—H. Beadle, 13, Chandos Street, Keighley, Yorks.
G8UV.—G. A. Gorst, "Casimere," Chestnut Avenue, Airmyn, near Goole, Yorks.
G8UZ.—A. J. Marriott, 29, Columbia Avenue, Sutton-in-Ashfield, Notts.
G8VA.—A. J. Martin, 11, Batten Street, Aylestone, Leics.
G8VU.—D. G. Blair, 349, Wilbraham Road, Manchester, 16.
G8WC.—Jas. S. K. Stephens, 23, Cobden Avenue, Copnor, Portsmouth, Hants.
G8WF.—Dennis Westwood, 31, Godley Street, Royston, near Barnsley, Yorks.
G8WI.—C. R. Thompson, The Chestnuts, Orford, Woodbridge, Suffolk.
G8WR.—D. L. Werschker, 19, St. Kilda Road, West Ealing, W.13, London.
G8WT.—W. F. Taylor, 285, Heysham Road, Morecambe, Lancs.

CALIBRATION SERVICE

Crystals should be sent direct to the Calibration Manager enclosed in a small tin, and securely packed to avoid loss in transit. The Society cannot be responsible for any loss that might occur in sending crystals through the post.

Return postage must be enclosed as postage stamps, and not attached to the Postal Order.

Calibration fees: 1.7, 3.5 and 7 Mc. crystals, 1s. 6d.; 100 kc. crystals, 2s. 6d.

All communications should be addressed to:—

Mr. A. D. Gay (G6NF),
"Oak Dene,"
156, Devonshire Way,
Shirley,
Croydon,
Surrey.

See *A Guide to Amateur Radio* for particulars of frequency meters, etc.

2AFB.—B. H. Douthwaite, 28, Haslemere Avenue, Hendon, N.W.4, London.
2AFO.—N. A. Owen, 6, Elder Street, Brighton, 1, Sussex.
2AKS.—K. D. Jackson, "Selbourne," 4, Highfield Crescent, Brighton, 6, Sussex.
2ARN.—F. H. Spencer, "Redlands," Bonington Road, Mapperley, Notts.
2ARU.—R. A. Loveland, Handcross, Haywards Heath, Sussex.
2ASH.—Macclesfield Grammar School Radio Society, The Grammar School, Macclesfield, Cheshire.
2ASX.—R. C. Whiting, 62, Walton Road, Chesterfield, Derbys.
2ATB.—L. G. Shaw, 26, High Street, Alton, Hants.
2AUV.—J. Schefer, 43, Station Road, Harpenden, Herts.
2AXF.—I. L. Holmes, "Miami," The Close, Headlands, Kettering Northants.
2AXV.—J. H. Chapman, 11, New Way Road, Leicester.
2AZR.—L. S. Frater, c/o Vevis, 1, Kingston Terrace, Sleaford, Lincs.
2BBR.—F. S. Southwick, 6, Brentwood Villas, Flemingate, Beverley, E. Yorks.
2BGF.—F. B. Holt, 40, Britain Street, Bury, Lancs.
2BJV.—G. L. Turner, 65, Warley Hill, Brentwood, Essex.
2BMK.—Wm. H. Thompson, Flat 1, Fire Station, Paradise Street, West Bromwich, Staffs.
2BQO.—H. Munro, 36, Strowan Street, Sandyhills, Tollcross, Glasgow, E.2, Scotland.
2BXF.—G. I. Steel, 29, City Road, Brechin, Angus, Scotland.
2BYK.—J. C. Payne, "Craigwell," Doniford Road, Watchet, Somerset.
2BZP.—P. J. Burwell, "The Croft," Carr Lane, Grimsby, Lincs.
2CAP.—R. J. Pullin, "Linwood," Stagsden Road, Bromham, Bedford.
2CBV.—S. S. Jeffs, 19, Corbyn Road, Bordesley Green E., Birmingham, 9.
2CPN.—W. Norris, 5, Stanley Street, Ilkeston, Derbys.
2CTF.—E. Filby, 36, Boston Gardens, Brentford, Middlesex.
EI5M.—Lieut. R. C. B. Stuart, R.A. Mess, Spike Island, Queenstown, Co. Cork, I.F.S.

Cancelled: G6RL, G8MT, 2AFA, 2AIV, 2AJU, 2ALR, 2AQU, 2ARB, 2AUA, 2AVQ, 2AVW, 2AYM, 2AZG, 2BAI, 2BDV, 2BDX, 2BGQ, 2BIY, 2BKF, 2BNN, 2BTQ, 2BXG, 2CCK, 2CDP, 2CFA, 2CGR, 2CKC, 2CKU, 2CKY, 2CNG, 2CNT, 2CPB, 2CQZ.

NEW MEMBERS.

Home Corporates.

M. S. Bell (G2FX), 17, Bainbridge Road, Leicester.
T. Simkins (G2QA), "Zummervilla," Tetney Road, Humberston, Near Grimsby, Lincs.
F. N. Evans (G2KL), 15, Rochester Road, Gravesend, Kent.
D. D. Marshall (G2MA), "Moorlands" Hall Road, Moorgate, Rotherham, Yorks.
R. H. Streete (G2SD), Grey Roofs, Princes Drive, Littleover, Derby.
R. Ashton (GW5YB), Bryn Afon, Penmon, Anglesey, North Wales.
R. Bottomley (G6TZ), 83, Hermitage Road, Wyken, Coventry, Warwicks.
P. X. Fox (G6UM), Newlaithes Cottage, Horsforth, Yorks.
T. Toward (G8IY), 136, Reepham Road, Norwich, Norfolk.
F. H. Clarke (G8NJ), 32, Alder Road, Longford, Coventry, Warwicks.
R. Taylor (G8OF), 45, Everard Street, Crosland Moor, Huddersfield, Yorks.
K. Hopkinson (G8QX), 4, Stephen Hill, Crosspool, Sheffield, 10.
J. R. E. Driscoll (G8RC), "Montazah," St. Charles Road, Brentwood, Essex.
P. Harrad (G8UN), 117, Heywood Road, Prestwich, Manchester.
G. Sellers (G8VS), 177, Paley Road, Bradford, Yorks.
G. H. Mackereth (2ACI), Rock House, Victoria Road, Ulverston, Lancs.
R. J. Woods (2AJD), 32, The Street, Ashtead, Surrey.
R. S. Ridley (2ALR), "Rosedene," Doncaster Road, Pontefract, Yorks.
W. S. Hall (2AOL), "Pensacola," King Edward Road, Loughborough, Leics.
G. H. Hill (2BAO), 65, Coningsby Road, High Wycombe, Bucks.
E. T. Sands (2BXW), 38, Albert Street, Maidstone, Kent.
H. F. H. Palmer (2CDU), 10, Cumberland Drive, Hinchley Wood, Esher, Surrey.
J. H. Ayre (2CGH), "Stel-Mar," Victoria Place, Eastbourne, Sussex.
T. M. Auld (2CHP), 40, Boyd Street, Largs, Ayrshire.
B. Cowan (2CIU), 115, Main Street, Hensingham, Near Whitehaven, Cumb.
R. A. Wilson (2CNV), 10, Garden Close, Watford, Herts.
H. T. Brock (2CUO), "Isis," Walsall Road, Aldridge, Staffs.
R. C. Frost (2CVT), 44, Barrow Road, Streatham, S.W.16.
H. G. Mappin (2CXR), "Mundays," Writtle, Essex.
J. A. Speares (2CZV), 57, Green Street, Park Lane, W.1.
T. G. Harwood (BRS3102), 14, Holly Terrace, Sunderland, Durham.
W. J. D. Mirtle (BRS3103), 15, Hall Place, Galashiels, Selkirk, Scotland.

J. R. Hooper (BRS3104), 30, Marmion Avenue, Chingford, London, E.4.
H. W. Evens (BRS3105), Buntingsdale Hall, Market Drayton, Shropshire.
D. J. B. Upton (BRS3106), 57, Lena Street, Easton, Bristol, 5, Glos.
R. J. Mace (BRS3107), The Cottage, Ashley Road, Newmarket, Suffolk.
T. G. Geddes (BRS3108), The Rectory, North Tuddenham, East Dereham, Norfolk.
R. J. Bates (BRS3109), 5, Childebert Road, Tooting, S.W.17.
J. Leonard (BRS3110), "Lyndhurst," Church Road, Kingswood, Bristol, Glos.
N. Ashton (BRS3111), Camp View, Station Road, West Town, Near Bristol.
D. W. Dunnett (BRS3112), 205, Nacton Road, Ipswich, Suffolk.
N. Coleman (BRS3113), 6, Asmara Road, West Hampstead, London, N.W.2.
J. N. Staniforth (BRS3114), 24, Connaught Avenue, Loughton, Essex.
G. W. Berry (BRS3115), 1569, Coventry Road, South Yardley, Birmingham.
F. W. Fisher (BRS3116), 15, Lucas Road, Colchester, Essex.
W. McInarlin (BRS3117), 88, Greyfriars Street, Cartyne, Glasgow, E.2.
A. W. Askew (BRS3118), 9, South Grove House, West Hill, Highgate, N.6.
F. H. G. King (BRS3119), 16, Barrington Road, Crouch End, N.8.
A. E. Wall (BRS3120), "Dee View," Tongland, Kirkcudbright, Scotland.
J. Ostle (BRS3121), 2, Outgang, Aspatria, Carlisle, Cumb.
R. T. Seaby (BRS3122), 106, Roe Road, Northampton.
H. L. Williams (BRS3123), High Beech, Whyteleafe Road, Upper Caterham, Surrey.
W. J. Hartwell (BRS3124), 247, Lichfield Road, Four Oaks, Sutton Coldfield, Worcs.
J. C. D. Spurgin (BRS3125), 36, Embankment, Bedford.
J. Crichton (BRS3126), 27, Ashludie Terrace, Monifieth-by-Dundee, Angus.
G. W. M. Rowland (BRS3127), 47, Zealand Avenue, Harmondsworth, West Drayton, Middlesex.
H. W. Jennings (BRS3128), 47, Upland Road, Selly Park, Birmingham.
G. P. Watts (BRS3129), 8, Belmore Road, Thorpe, Norwich, Norfolk.
A. L. Ralston (BRS3130), c/o Redpath, 415, West Princes Street, Glasgow, C.4.
G. F. Walmsley (BRS3131), 2, Sebastian Avenue, Shenfield, Essex.

Dominion and Foreign.

Chong Foong (VS3AD), Sultan Abdul Hamid College Quarters, Alor Star, Kedah, Malaya, S.S.
F. L. Hawthorn (ZL1GX), 10, King Edward Street, Mt. Eden, Auckland, S.2, New Zealand.
E. Vella (BERS416), "Silver Bells House," Norfolk Street, Sliema, Malta.

R.S.G.B. SLOW MORSE PRACTICES

Details will be found below of the slow Morse practices organised by the Society for those members wishing to learn or improve their code. As usual, test matter will be taken from recent issues of the T. & R. Bulletin. The page number and month of issue will be given at the end of each test—by telephony. A telephony announcement will also be given at the commencement of each test to assist those interested in tuning to the sending station. It is emphasised that reports will be appreciated and are desired, in order to ascertain useful range of transmission and numbers utilising the service. If, however, a reply is desired, a stamp should be sent. Will stations in areas not at present served offer their services to Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4. (Telephone: Silverthorn 2285.)

Schedule of Slow Morse Transmissions

1937			G.M.T.	kc.	Stations
Dec.	19	Sunday ...	0945	7155	GI5UR
,,	19	Sunday ...	1000	7260	G5JL
,,	19	Sunday ...	1015	1920	G6VC
,,	20	Monday ...	2315	1741	GI6XS
,,	21	Tuesday ...	2200	7184	G6UA
,,	22	Wednesday...	2315	1741	GI6XS
1937			G.M.T.	kc.	Stations
Dec.	23	Thursday ...	2200	7184	G6UA
		Christmas Tide.			
,,	28	Tuesday ...	2200	7184	G6UA
,,	29	Wednesday...	2315	1741	GI6XS
,,	30	Thursday ...	2200	7184	G6UA
1938					
Jan.	2	Saturday ...	2300	7145	GI5QX
,,	3	Sunday ...	0945	7155	GI5UR
,,	3	Sunday ...	1000	7260	G5JL
,,	3	Sunday ...	1015	1920	G6VC
,,	4	Monday ...	2315	1741	GI6XS
,,	5	Tuesday ...	2200	7184	G6UA
,,	6	Wednesday...	2315	1741	GI6XS
,,	7	Thursday ...	2200	7184	G6UA
,,	9	1.7 *Mc. Contest*			
,,	11	Monday ...	2315	1741	GI6XS
,,	12	Tuesday ...	2200	7184	G6UA
,,	13	Wednesday...	2315	1741	GI6XS
,,	14	Thursday ...	2200	7184	G6UA
,,	16	Saturday ...	2300	7145	GI5QX
,,	17	Sunday ...	0945	7155	GI5UR
,,	17	Sunday ...	1000	7260	G5JL
,,	17	Sunday ...	1015	1920	G6VC
,,	18	Monday ...	2315	1741	GI6XS
,,	19	Tuesday ...	2200	7184	G6UA
,,	20	Wednesday...	2315	1741	GI6XS

Radio Diaries

Ever popular, "The Wireless World" Diary once again comes to greet us. The 1938 edition following previous style and format contains, in addition to the usual diary, over 70 pages of invaluable technical information. Abacs, Wire Tables, lists of Broadcast and Short Wave stations, base connections of British and American valves, circuit diagrams and amateur frequencies are among the many subjects covered in this invaluable little pocket companion.

Throughout the diary pages appear little gems of wisdom, each giving a useful hint on some phase of radio work.

The price is 1s. 6d. from all booksellers and stationers, or 1s. 7d. post free from *Iliffe & Sons, Ltd.*, Dorset House, Stamford Street, S.E.1.

The well-known Collins Wireless Diary introduces itself with the motto "The man who knows what he is doing has the pull all the time over the man who only guesses." The truth of this statement is known to every radio man. The general and technical information extends over 146 pages and includes in addition to other data a list of Logs and Anti-logs, algebraic formulæ, chapters on Accumulator Maintenance, Mains Receivers, Selectivity in Broadcast Receivers, Radio Telephony, etc. A useful glossary of radio terms is also included. Squared paper leaves are inserted at the back of the diary. Over 120 separate subjects are mentioned in the table of Contests.

The diary is available in six styles ranging from Type 3941 in fast bound art cloth with round covers and gilt speckled edges at 1s. 3d., to the polished venetian leather type with pockets back and front at 4s. 6d. Three renewable types costing 6s., 6s. 6d. and 7s. are also available.

The diary can be obtained from stationers and booksellers or direct from the publishers, *Collins*, 144, Cathedral Street, Glasgow C4, or 4, Bridewell Place, London, E.C.4.

NOTES and NEWS

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).
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. G. W. Slack (G5KG), "Inglenook," Racecourse Road, Mansfield, Notts.

DISTRICT 5 (Western).
(Hereford, Wiltshire, Gloucester.)
Mr. J. N. Walker (G5JU), 4, Frenchay Road, Downend, Bristol.

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

DISTRICT 7 (Southern).
(Oxfordshire, Berkshire, Hampshire, Surrey.)
Mr. E. A. Dedman (G2NH), 75, Woodlands Avenue, Coombe, New Malden, Surrey.

DISTRICT 8 (Home Counties).
(Beds., Cambs., Hunts and the towns of Peterborough and Newmarket.)
Mr. G. Jeapes (G2XV), 89, Perne Road, Cambridge.

DISTRICT 9 (East Anglia).
(Norfolk and Suffolk.)
Mr. H. W. Sadler (G2XS), "The Warren Farm," South Wootton, King's Lynn, Norfolk.

DISTRICT 10 (South Wales and Monmouth).
Capt. G. C. Price (GW2OP), The Mount, Pembroke Dock.

DISTRICT 11 (North Wales).
(Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth Montgomery, Radnorshire.)
Mr. D. S. Mitchell (GW6MX), "The Flagstaff," Colwyn Bay, Denbighshire.

DISTRICT 12 (London North and Hertford).
(North London Postal Districts and Hertford, together with the area known as North Middlesex.)
Mr. S. Buckingham (G5QF), 41, Brunswick Park Road, New Southgate, N.11.

DISTRICT 13 (London South).
Mr. J. B. Kershaw (G2WV), 13, Montpelier Row, Blackheath, S.E.3.

DISTRICT 14 (Eastern)
(East London and Essex.)
Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4.

DISTRICT 15 (London West).
(West London Postal Districts, Bucks, and that part of Middlesex not included in District 12.)
Mr. H. V. Wilkins (G6WN), 81, Studland Road, Hanwell, W.7.

DISTRICT 16 (South-Eastern).
(Kent and Sussex).
Mr. W. H. Allen (G2UJ), 32, Earls Road, Tunbridge Wells.

DISTRICT 17 (Mid-East).
(Lincolnshire and Rutland.)
Mr. W. Grieve (G5GS), "Summerford," New Waltham, Lincs.

DISTRICT 18 (East Yorkshire).
(East Riding and part of North Riding.)
Mr. W. A. Clark (G5FV), "Lynton," Hull Road, Keyingham, E. Yorks.

DISTRICT 19 (Northern).
(Northumberland, Durham, and North Yorks.)
Mr. H. C. D. Hornsby (G5QY), "Newlands," 105, Kenton Lane, Newcastle-on-Tyne, 3.

SCOTLAND.
Mr. James Hunter (GM6ZV), Records Office, 51, Camphill Avenue, Langside, Glasgow.

NORTHERN IRELAND.
Mr. T. P. Allen (GI6YW), 62, Balmoral Avenue, Belfast.

New Members are cordially invited to write to their local District Representative.

DISTRICT 1 (North-Western)

THE D.R. sends best wishes and greetings to all in No. 1 District.

Liverpool and District—Twenty-five members attended the last meeting, when it was announced that the Society films will be shown on or about February 7, 1938. It is hoped that technical films will be also shown from time to time, as members have a film expert in G8DI. After a discussion of general business, Messrs. Drudge Coates (G2DC) and Bailey (2QB) gave a summary of radio work in the Army and a demonstration of certain apparatus.

Activity on the air seems to have fallen off. 2AIJ, from Scotland, has joined the local group and will be pleased to arrange listening schedules with local members on any band up to 224 Mc. G8DI paid a visit to Nottingham amateurs and is on 7 Mc. 'phone and CW, 2OA is active on 1.7 and 56 Mc., and 2CDQ reports interest in 56 Mc., on which band there appears to be some local activity.

Rochdale.—No reports have been received for November, but G6QA is active, and 5XF has also been heard. Will members please report matters of particular interest to the T.R.?

Birkenhead and Wirral.—At the last meeting of the Wirral Amateur Transmitting and Short Wave Club a list of "Puddle-Brained Goof Operators" was exhibited.

Activity in this area seems fairly brisk, but reports are few. The regulars have reported, but why not some reports from the others? G8NH is rebuilding; 6HQ has a Windom aerial which he says is of no use; 8PG is very busy with commercial gear; 8OC is trying 7 Mc. 'phone; 2FZ has rebuilt with ECO; 6GL is rebuilding when time permits.

Blackburn and District.—A preliminary meeting of the Blackburn and District Branch of the R.S.G.B. was held at 2CRM on Sunday, November 14. Considering the early hour, the cold morning and the call of the bands, there was an excellent attendance!

Mr. A. Tomlinson (G2QN) was elected T.R. for the coming year. It was decided that before any person should be invited to participate in local functions he should display a genuine interest in amateur radio and give an undertaking to join the R.S.G.B. at the earliest possible moment. To cater for the usual financial cramp experienced on these occasions a contributory scheme was formulated which provides for contributions from one shilling upwards being retained in a central fund administered by the T.R. Immediately a member has fifteen shillings standing to his credit he signs on the dotted line and joins the R.S.G.B. There is no foundation in the rumour that the new T.R. is taking up sprinting!

To maintain interest it was agreed that informal rag-chews should be held at members' homes on the second Sunday in each month.

Thanks to all those who turned up and to Mr. and Mrs. 2CRM for the warm welcome extended, which helped so much to make the inaugural meeting a success.

Individual reports are as follow:—2CSC is testing with 6L6 CO driving 6L6 PA; 2HW has transferred from 14 to 3.5 Mc. now conditions are falling off on the former band; 8FI has been heard on 7 Mc. 'phone and CW; 2AQI is interested in 56 Mc.; 6BH has new TX awaiting completion; 2CRM, 2AQY, 8LZ, 2QN and 8JA also report the usual activities.

Persons interested in amateur radio are advised to get into touch with G2QN, Waverley, Preston Old Road, Feniscowles, Blackburn, who will be pleased to give details of local activity.

Burnley.—The best DX report is from 2RB, who worked ZL four mornings running with 9 watts input to a W3EDP aerial. 8TD is active on 7 and 14 Mc. and has forsaken his 6L6 PA for a T20 with a view to 28 Mc. work; has contacted TF3P on 'phone. 8DC and 8UA are father and son at the same QTH. BRS2951 hopes to be on the receiver again during his Christmas vacation. 2BFB is busy building an electron-coupled frequency wavemeter to make his station more efficient. 8FI is carrying out QRP tests (4 watts) with aerial couplers on 7 Mc., and is also on 14 Mc. 'phone with a new Grampian type M microphone. In addition, he is instructing 2CNQ in morse, who hopes to become an R.S.G.B. member soon. 8FI is putting up a W3EDP aerial. BRS2801, of Rossendale, is building a new receiver with optional quench and selective audio stage. 2CVI expects to have more spare time in the New Year. G5ZN is testing the W3EDP on 3.5 Mc.

Manchester.—No meeting was held in Manchester during August, but an attendance of 21 was recorded in September, this meeting being devoted to general discussions. Seventeen members attended the October meeting at Brookes Café, when G5YD gave a very interesting talk on class B amplification, which led to some lively arguments. The usual half-hour's morse practice for beginners preceded this talk.

The following stations report active on various bands:—2WQ, 2HW, 2LK, 2OI, 2ARC, 2BMG, 6KS, 5OZ, 5YD, 2BDA, 2CXP, 2CZW, 8PW, 2918, 5WR, and 2RA.

DISTRICT 2 (North Eastern).

Ilkley.—The Ilkley group are very active, with members reporting as follows:—G6SN using new superhet and working interesting DX; 8VQ putting out some very good telephony; 8BT testing aerials; 6BR working 'phone; 8ID on 14 Mc. using a 6L6 the fourth harmonic of which drives a PX4 to 10 watts.

Huddersfield.—The big event last month was a visit from Barnsley, when 20 members assembled at 5VD's QRA. It was a great pleasure to meet our visitors and we are looking forward to the

FORTHCOMING EVENTS

Dec. 16.—District 6 (Torquay section), 7 p.m., at G5SY, "Sherrington," Cleveland Road, Torquay.
,, 16.—Scotland "A" and "E" Districts, 7 p.m., in Room 119, Natural Philosophy Section, Royal Technical College, George Street, Glasgow.
,, 17.—District 12, 7.45 p.m., at The Orpheum Cinema, Temple Fortune, N.W.11.
,, 19.—District 11, 7 p.m., at GW6KY, Cavendish House, Gronant Road, Prestatyn.
,, 19*.—District 4, 3.30 p.m., at the Trent Bridge Hotel, Nottingham. Talk by Mr. Oxley (G8MW) on "Direction Finding." Tea at 1s. 9d. per head. *
,, 20.—District 14 (East Essex section), 8 p.m., at G6CT, 23, Eastwood Boulevard, Westcliff-on-Sea.
,, 20.—District 12 (Watford Group), 8 p.m., at 2BTV, 6, Hemstead Road, King's Langley.
,, 21.—District 6 (Plymouth Section), 7.30 p.m., at G6RF, 3, Hill Lane, Hartley, Plymouth.
,, 22.—Scotland "H" District, 7.30 p.m., in District Clubroom, Bank Street, Kirkcaldy.
,, 29.—Scotland "A" and "E" Districts, 7.30 p.m., in Room "A." Institution of Engineers and Shipbuilders, 39, Elmbank Crescent, Glasgow.
,, 29.—Annual General Meeting, 6 p.m., at I.E.E. Tea at 5.30 p.m. Lecture and demonstration by Mr. G. Parr, Edison Swan Electric Co., Ltd. Subject: "Progress in Television Reception."
Jan. 2.—District 7, 2.30 p.m., at The Grosvenor Hotel, Kidmore Road, Caversham, Reading.
,, 3.—District 14 (East London section), 8 p.m., at 2CID, The Modern Restaurant, 235, Chingford Mount Road, S. Chingford, E.4.
,, 5.—Scotland "H" District, Details as above.
,, 5.—District 1 (Manchester Section), at Brookes' Café, 1, Hilton Street, off Oldham Street, Manchester. Slow morse lesson at 7.30 p.m.

* Sale of disused apparatus at this meeting.

return visit next January. Congratulations to 6RO, who is WBE on CW; 8FO has a fine new layout; 8KY, 8CW, 8QT, 8VF and 2ALU report active. The letter budget is on its third round.

Sheffield.—According to the notes, activity is increasing, but there are still a few members who do not contribute. It only needs a postcard to 2JY, so what about it? Members wishing to attend the dinner in January must notify 2JY as soon as possible, if they have not already done so. A good attendance is desired at the next meeting, which will be held on January 6, 1938, at the Angel Hotel. At the last meeting, 8KT described in an interesting manner his U.S.A. visit and 5TO gave a talk on aerials. BRS2293 is to discuss the measurement of R.F. at a future meeting. Active stations are: 8KT testing doublet on 14 Mc.; 2CFA, now G2JI, and testing on 7,040 kc.; 5HK trying Johnson aerial on 14 Mc.; 8JP has fitted RK25 and is pleased with result; 8RX on 14 Mc. 'phone; 6LF trying a T20 on 14 Mc.; BRS2293 preparing for the P.O. test. Others active include: G2AS, 2DJ, 2XH, 2JY, 8NN, 2BXA, 2CBQ, and BRS2282.

Leeds.—Many complaints are being received regarding local amateurs using high power for hours on end for purely local QSO's of a very doubtful experimental nature. It should be realised that our signals are often heard by BCLs on modern all-wave sets, and these transmissions will not do us any good. G5CX is sending slow code every Wednesday at 20.00 G.M.T. on 28,672 kc., and would appreciate reports.

Halifax.—G5QS and YF 2CYM are active on 7 and 56 Mc., and are using 10 watts of "inverse CW" with a half-wave matched impedance aerial. 8CB using a T20 on 1.7 and 14 Mc.; 8SJ on 14 Mc.; 2AKO testing artificial aerials and preparing for P.O. test; 2BHI using a Hartley circuit and listening on 14 Mc. each morning; 2ABC testing 6L6's, finds the screen voltages critical; 2CKH building a 56 Mc. receiver and reports all satisfactory; 2CMP using very low power for a Colpitts oscillator, fed from batteries.

Barnsley.—The visit to 5VD, of Huddersfield, was enjoyed beyond all expectations, and he is to be congratulated on such a fine station. A return visit is arranged for January. Congratulations to 2CQZ and 2BNN, who are now 8WF and 6XG respectively. 2CGD has invested in a RME69.

Bradford.—Has anyone in the Bradford area or any adjoining area sufficient interest to drop G6KU a card saying he would attend a visit and informal meeting at either the QRA of 6XL or 6KU during the next two months? Please state time and days convenient.

DISTRICT 3 (West Midlands)

During the month two events of rather general interest to the District have taken place.

Firstly, on November 9, an "open" meeting of M.A.R.S. bid fair to rival a District Conventionette, between 60 and 70 persons attending. The meeting was attended by a strong contingent from Coventry as well as representatives from other parts of the district. An opportunity was taken by the D.R. to touch on the subject of the T.R. nominations or Birmingham, Coventry, and Wolverhampton, G5BJ and G5GR being nominated for the first two towns respectively. The D.R. also pointed out the desirability of giving next year's N.F.D. some thought, and he also mentioned the finding of a new site for the Birmingham station so that access could more easily be obtained by those not possessing cars.

After these remarks, G5VM took upon himself the duty of "projectionist" and the N.F.D. together with the R.S.G.B. film of London stations were shown. Both were thoroughly enjoyed by everyone present and thanks to G5VM for the apparatus were duly recorded.

After the films, a talk by Mr. D. Randall-Ayres (VK3KP) on conditions (radio and otherwise) in VK was particularly enjoyed by the company.

The second event was the M.A.R.S.-C.A.R.S. contest, which took place on Sunday, November 14. The contest, as its title indicates is between, Birmingham and Coventry. It is divided into two sections: (*a*) Transmitters, unrestricted to power (except by the P.M.G.) counting one point for each QSO and afterwards using the number of different countries contacted as a multiplier. C.W. only is used. (*b*) Receivers, open to non-transmitters but including A.A. members, following the same general rules as the transmitters except that points are scored for each QSO logged on C.W. or phone. Both the incoming RST and outgoing RST had to be noted, thus eliminating test and CQ calls. The country multiplier was similar to the transmitting section. The winners of each section will be announced in these notes next month.

Coventry.—Members in Coventry are asked to note that the C.A.R.S. meeting night has been changed to Friday, this being necessary to enable several members to attend lectures on Air Raid Precautions.

Congratulations to G5HX on obtaining his full ticket.

It is unfortunate that, owing to the difficulty of obtaining accommodation, the C.A.R.S. annual dinner will have taken place by the time these notes appear, and we regret that no previous notification could be published.

It is hoped to arrange, in the near future, a lecture to be given by Mr. N. Best (G5QN) on "The Short Wave Superheterodyne Receiver." All members of M.A.R.S. together with any other members of R.S.G.B., are invited to come along to this and subsequent lectures. Further details next month.

DISTRICT 4 (East Midlands)

A very successful meeting was held at Loughborough on November 21, 34 members were present and a very interesting talk was given by Mr. Ridgeway (G2RI) on "The Activities in Leicester—Past, Present and Future." The talk proved of great interest to all and proved without doubt that town meetings can be held each week and be of great use to all the membership. Mr. Ridgeway outlined the entire procedure of how the Club was first formed, what it has done, what it is doing and what they hope to do in the future. He also described the competitions which they hold every three months for the Ridgeway Trophy and the Vendy Trophy. The first cup was presented by Mrs. Ridgeway (2BLR) and is competed for by the transmitting section. The second trophy was presented by Mr. Vendy (G6VD) and is competed for by the AA and BRS membership. Members were reminded of the folly of not taking advantage

of the facilities which the Society offers in regard to obtaining 25 watt permits. It was pointed out that if members apply direct to the G.P.O. they must furnish sound technical reasons and if they are turned down it is very difficult for the Society to do anything in the matter.

A few words were spoken about District Notes. Members are asked not to send in notes regarding personal operation or gear. Items of general interest are needed, such as unusual phenomena noticed on any band, especially 28 and 56 Mc. Stations heard or worked on 56 Mc., comments about new circuits, aerials, genuine QRP and portable and field-strength measurements are but a few of the items we should like to hear about. If each member would only send in one item each month, District Notes would be the most eagerly read pages in the "BULL."

Nottingham.—The D.R. wishes to remind the Mapperley and West Bridgford sections that they now have sufficient members to appoint T.R.s. They are asked to select, if possible, members who will look after the BRS and AA membership so that it leaves the Nottingham T.R., G2IO, to look after the interests of the transmitting membership. We hope to go into this matter fully at the December meeting.

The Nottingham 56 Mc. network is extending and is joined by G5VU and G2IO. The key stations, G8JV and G6CW, continue to maintain regular contacts with Derby and Leicester. Members are advised that each Monday and Friday evenings from 8 p.m. onwards is "5-meter night" in the District and contacts with the north would be welcomed. On the lower bands the following active stations are: G2HD, G5DM, G5QZ, G6HL, G8UI.

Ilkeston.—Activity on 56 Mc. is still continued. Enthusiasm has led to further experiment, particularly with aerials and contacts up to 10 or 15 miles are now made with ease. One or two new stations appeared—including G2IO, who is now regularly on the band, and G6JQ, who gave us one or two contacts with Leicester, but has now disappeared. Regular Monday, Thursday and Sunday skeds on 56 Mc. are maintained between G2IO, 2WS, 5VU, 6CW and 8JV, and usually one or two of these stations may be heard any evening around 8 p.m. Reports from any BRS stations, particularly those situated in the North of the District will be very welcome.

Derby.—Congratulations to G8AZ who opened up the first 56 Mc. channel between Derby and Nottingham. This was the forerunner of a regular Monday and Thursday schedule at 21.00 G.M.T. with 8AZ, 2SD and 8JV participating. Both 8AZ and 2SD are C.C. with 25 and 50 watts input, respectively.

Northants.—All members have received a personal letter from G5LP (Northants representative). BRS1491 is working on 56 Mc. receiver experiments. (Please look out for signals from the Nottingham and Leicester members.—G5KG.) G5LP is testing W3EDP aerial with good results. WAC-WBE has been obtained using the DX Two transmitter with 350 volts power supply. He is now taking fieldstrength measurements of the W3EDP both on 7 and 14 Mc. in an attempt to obtain its radiation curves on these two bands. BRS2179 becomes 2CSH and hopes to enter the B.E.R.U. reception contest. BRS2888 becomes 2CTZ and has built the DX Two with modulator and power pack. G2DZ, who is with the B.B.C. at Daventry, hopes to have a NC81X receiver. Will all Northants members send in their notes to G5LP by the 21st of each month and will BRS1491, 2495 and 2ATO please reply to the letter sent by G5LP?

Worksop.—G6MN is building an ECO rig and also acquiring a crystal super. G8PO is modernising his receiver and G8ON buys a British receiver made by *Evrizone*. The rest of the gear is slowly being rebuilt. 2CAJ has just completed a new receiver. Members are asked to give their full support to the Town Meeting and help to make it a success.

Mansfield.—Town Meetings have been commenced and are held at the Swan Hotel, Mansfield. The next will be at 3.0 p.m., January 9. The November meeting was a great success, all members but one being in attendance. Mr. Spafford (BRS113) is now in the Portsmouth Signals. We are pleased to hear from him because he is one of the "Old Timers" and we hope that he will soon be able to take part in Society affairs again. G5KG has made contact with FI8AC, Hanoi, French Indo China, frequency 14,090 kc., time 19.30 G.M.T.

Leicester.—New members of the Society are G2FX, 2AOL, and Mr. Lucas, a well-known member of the Leicester Radio Society. Mr. Lucas will be pleased to arrange a sked with his son, VS2AR, for any member of the District who wishes to contact VS2. New members who do not know the T.R. are invited to write him for particulars of local activity. His address is Mr. W. M. Vendy, 9, Cecilia Road, Leicester. They are also reminded, as all members are for that matter, that the Leicester section meet *every* Friday at 53, Cedar Road, Leicester, at 8 p.m. The T.R. has received no information of individual activity suitable for these notes. It was pleasing to see so many members at the Loughborough meeting; please keep it up OMs.

District Meeting.

The next meeting will be held on December 19 at the Trent Bridge Hotel, Nottingham, at 3.30 p.m. A talk will be given by Mr. Oxley (G8MW) on "Direction Finding." Price of tea 1s. 9d. A junk sale will be held.

DISTRICT 5 (Western).

The N.F.D. films were shown at a Bristol meeting on November 18 and were thoroughly enjoyed. The consistent technical excellence (photographically) was favourably commented upon and thanks were recorded to Mr. Ovens for his kindness in loaning and operating the equipment.

The best wishes of District members are extended to G5XV and his ex-YL, who were married on November 6.

The announcement of the 56 Mc. International Contest has aroused interest and several local members are preparing to take part in it.

G6BW is doing very well with 28 Mc. telephony and is congratulated on obtaining his 'phone W.B.E. G6RB, 6VF, 6GN, and 5JU are also making good use of the 28 Mc. band. G2GQ, whose call is often heard in the winter, is conspicuous by his absence. Having a rest from radio, OM?

Cheltenham.—G5BK has moved to 200, Prestbury Road, and is busy reorganising his gear.

G5BM is still active on 28 Mc. and is rebuilding a portion of his outfit. G8DA has been doing good work on 14 Mc., getting a number of W contacts with only 4 watts battery power. G8DT is still adding to his already large amount of gear and has longing eyes on a 14 Mc. W.A.C. G8ML has built a new receiver, but so far results have not come up to expectations. G8LB is going all out for a super-station using Class B. G8VJ (a new call) and 2AKR have left for new pastures. Good luck, O.M.'s. The town has had several visits from brother amateurs and will be pleased to welcome all enthusiasts. Meetings are held on Fridays. G6HL (ex SU6HL) has arrived at his new QRA at Cirencester.

No reports have been received from Bath or other parts of the District. Please report, either to the D.R. or T.R., by the 25th of the month.

DISTRICT 6 (South-Western).

Torquay.—Two attempts have been made to hold the monthly meeting at G5SY, but in each case the meeting has had to be cancelled. While playing tennis, the D.R. had the misfortune to damage a ligament in the leg and has been unable to get about and see to things. Most members were notified of the cancellations, but we are very much obliged to 2CRL for entertaining a few members who turned up on the second occasion. The next meeting is fixed for Thursday, December 16, and it is to be hoped that nothing interferes. Most local members are very active. G5IF is doing a considerable amount of 'phone work, 5SY is, as usual, in the middle of various rebuildings, including a 60-watt Class B modulator. 2CAA, 2CRL, 2CWR and 2BXU all constructing transmitters, while G2CI, 5GD, 5SY and 2AUF are on 56 Mc.

Taunton.—A very pleasant meeting was held at the Bristol Arms Hotel, Bridgwater, on November 11. After the usual formalities and tea the members inspected G5GT's transmitter, a most workmanlike job. 2CFG is now G5TN and 2BUC has become G6LY. Hearty congratulations, OM's! 2CMJ and 2BJC have passed their morse test and are awaiting their two-letter calls. Members present at the meeting: G5AK, 5TN, 5GT, 6LQ, 2BJC, 2CMJ, BRS3025, 3096 and visitors.

North Devon.—The monthly meeting held at G6FO, Appledore, on November 17, was attended by BRS2442, 2ADJ, G8US, G6GM and G6FO. A 1.7 Mc. Local Frequency Allocation scheme was discussed and adopted, this being necessary in view of the number of stations shortly to be on in this area. 2CBK, Barnstaple, and 2ADJ, Northam, will be in operation ere this is in print; the former, using a one-valve TX, is rather cramped for aerial space, but 2ADJ, with a CO-PA pentode rig, is on a fine site and should get out well. G8US still chases DX on 14 Mc., while G6GM is ready for 1.7 and 3.5 DX. We welcome BRS 3081, Torrington, a 56 Mc. expert, as a new member. The T.R. recently had the opportunity of visiting G6GM, G8US, 2ADJ, 2CBK, and 2CHY, the last of whom possesses a station of most up-to-date commercial appearance. Collectively, these stations set a high standard and ensure for North Devon a place in the limelight. The Letter Budget is not yet receiving the regular support of all members, though everyone wants it!

Plymouth.—The November meeting of the Plymouth section was held at 2AHX on November 26 and was attended by G6RF, 8PN, 8HF, 2AHX, 2CYJ, BRS2932 and 2997. The main topic of discussion was modulation. 8HF is getting out well with grid bias modulation, to his own surprise, while 6RF is now bemoaning a defunct RK20, in which the anode has become internally disconnected. Things are now going with a swing and Plymouth should soon be once more well on the map. The next meeting is at G6RF, 3, Hill Lane, Hartley, Plymouth, on December 21, at 7.30 p.m.

DISTRICT 7 (Southern).

The D.R. takes this opportunity of wishing all members a happy Christmas and good DX in the New Year. For the benefit of Berkshire and Oxfordshire members, the New Year meeting will be held on Sunday, January 2, at the Grosvenor Hotel, Caversham, Reading. This hotel is in Kidmore Road, and is reached from Caversham Bridge by turning left into Church Street, R. to Priest Hill, L. to St. Andrew's Hill, and R. to Kidmore Road.

Portsmouth.—The November meeting of the South Hants R.T.S. was held at the Civil Service Sports Club Hut, Hilsea. 2CBL gave a talk on "Straight Receivers," bringing out many points of interest and promoting discussion. Congratulations to G8WC on his new call. 2ZR is having trouble with his convertor, and is now on QRP with 2AWC, searching for the R.F. when he isn't building power packs! The usual local activity continues.

Croydon.—We have to welcome three members to this area; G2DN, who is busily building his TX and hopes to be on the air by the time these notes are published. BERS351, now 2CCA in the R.A.F., Kenley, who has had a good deal of amateur experience in SU, and 2AAO now in Caterham. The number of amateurs in this area is growing fast and the time is near when we shall have to have a check up on crystal frequencies in order to avoid interference with one another. G5XW has been ill for some time, but are are glad to hear him on the air again. G2MV, 2KU, and 5AN are still active, as no doubt are most others, but they have not sent in reports.

Southampton.—Local activity is at a low ebb, owing to the prevailing poor conditions on 14 Mc., and many stations are rebuilding and waiting for the band to open up again. G8LY is using V-beam, 66 ft. each leg, and has regular schedule with W2IXY on 14 Mc. phone. G2VF makes history by working W4IO on 28 Mc. CW for the first Southampton DX contact on that band. G2UR has come to Southampton and hopes to have TX running soon. Very hearty welcome, OM. 2BRM is busy swotting code. G8IM is testing 138 ft. Zepp The T.R. wishes all members the compliments of the season.

Reading.—At the November meeting of R. T. and R. S. 18 members were present. We welcome to Berkshire G8VP, of Faringdon; also congratulations to 2BIG now G6KB, on obtaining his full ticket. The meeting was given over to general discussion and a paper on "Ultra Short Wave Circuits" was read by G5RT. Most members report active. G5HH still working good DX and G2IT going well on 28 Mc. He has recently worked VK2 on both CW and phone on this band. G2IT disputes G2TK's claim, mentioned in G2YL notes, of first

contact with HR4AF on October 6. G2IT worked this station on 28 Mc. on September 26, and already has QSL proving the contact. G5AO is on 28 Mc., and has worked OH and SV. G6WO has worked HO2U, who gave QRA as "Ship in Suez." He also worked OXVC and has QSL from him. G8MS has worked OHKI; this is not a pirate but a Finnish ship; QRA at time of contact 61° N.-29° E. of Viborg. G5AO has worked TA2AM, and believe him to be a pirate. He had a T2 note at high frequency end of 14 Mc. G2YB active on 28 and 14 Mc. Another new AA call is 2BHS. G2GG, 5RT, 5TP, 6CU, 6GT, 8KJ, and 8MG all report active on most bands. The T.R. wishes to remind members in Berkshire that notes must reach him by 18th of each month. (25th is early enough.—Ed.)

Guildford.—G6GS undergoing seventeenth rebuild since his recent return from the North, operates on 28 Mc. with 8 watts to a 6L6G. G6LK active on 56 and 28. On the latter band approaching his one thousandth W6 phone contact. G6NA now able to get into recently enlarged shack himself, as well as nearly all the gear; Using push push doubling T20's to 56 Mc. G8IX active on 14 and 56 Mc.; on 14 Mc. RK23 final put S9 signal into FI8AC. G6YX, 8RH, 8VG, new calls on 7 Mc. and 14 Mc. G5WP 28 and 14 megacycling after move. Building new TX for 28 and 56, using T20 and Reinartz loop aerial.

DISTRICT 8 (Home Counties)

The air around Cambridge seems remarkably clear of late, and whilst it may be due to bad DX conditions one can hardly blame conditions for the fact that only one official report is to hand this month, which comes from our ever efficient TR in Peterborough. The first District meeting to be held in Bedfordshire took place at The George and Dragon, Bedford, on November 5. Thirteen members were present, and an interesting evening was spent discussing the forthcoming district transmitting contest for the Granfield Trophy. Mr. H. R. Jeakings (2AWH) agreed to act as T.R.

The handsome Challenge Cup presented by Mr. S. J. Granfield (G5BQ) for annual competition among District 8 Members.

for Bedford, as a result of which it is hoped to see more active interest in that part of the District. The next District meeting will take place on Friday, January 7, 1938, at 8 p.m. sharp, at the Fitzroy Arms, Fitzroy Street, Cambridge. The new stations around Cambridge appear to be active, and signals are to be heard from G5BQ and 5DQ, both newcomers. A television aerial has appeared from the top of 5JO's house on an enormous mast; possibly this is the reason for his call not being so prominent of late. 5DR is awaiting the arrival of a new valve and a new receiver. 2PL is heard on very rare occasions. 8FF's neighbours state that he is quite active! 2XV fills in time on 7 Mc. with occasional bursts on 3.5 Mc. whilst awaiting a return of 14 Mc. conditions.

Peterborough is still on the map with 2UQ and 2NJ competing for the best 7 Mc. phone signal.

The D.R. takes this opportunity of wishing all members a very happy Christmas with lots of good luck and DX in 1938.

DISTRICT 9 (East Anglia).

Reports have come in fairly well again this month.

Norwich.—G5IX is busy on 3.5 Mc. and has successfully adapted his new U.H.F. receiver for working on that band. He has also completed a frequency meter, which is giving great satisfaction. G6QZ is busy moving to his new QRA and will be on the air again by the time these notes are in print. G2UT is putting out a very fine signal on 7 Mc. 'phone from his new rig. G2MN is experimenting with 6L6 valves in ECO circuits, and plans to be on the air again this month. His first tests will be on 3.5 Mc., then later on 14 and 28 Mc. G5LW, of Banham, is rebuilding his transmitter and has installed some very fine test gear, including a cathode-ray oscilloscope.

Beccles.—2CRY is trying various doublet type receiving aerials with interesting results. 2CRT still testing out P.A. stages. Mr. Algar (2AFC) has at last commenced building his transmitter, which he has been planning for some time.

King's Lynn.—Activities low, due to various causes. G5UD, at Swaffham, is QRT owing to business. G2XS is progressing slowly with the re-design of his station. 2ABX is active with A.A. experiments.

Ipswich.—Mr. Keeble is now licensed under the call G2AN and will shortly be active on 7 Mc.

Lowestoft.—G8DD has again dismantled his gear and is rebuilding with a Taylor T20 tube as a PA for 14 and 28 Mc. His new U.H.F. receiver is completed and giving good results. 2CWO is doing much listening and swotting hard at morse. G5QO is occasionally on 3.5 Mc. 'phone.

Orford.—BRS Charles Thompson is now licensed under the call G8WI and will shortly be working on 7 Mc. CW. BRS2299, of Haverhill, is shortly applying for a three-letter call.

Will the Ipswich, Gt. Yarmouth, Bungay, and Norwich members please report activities to G5QO by December 23? A card is all that is required.

By the time these notes appear the festive season will be close upon us, and the D.R. would like to take the opportunity of wishing all District 9 members a very Happy Christmasand a Prosperous New Year.

DISTRICT 10 (South Wales and Monmouth).

Cardiff.—Congrats to 2AJN, 2BHA and 2BHZ, who are now active under the calls of 8WU, 5AB and 2UH respectively. There are now eight active transmitters in Cardiff, and local duplex working is the order of the day. In Penarth stations active are 2XZ, 5XZ and 8AM.

Swansea.—It has been decided to run monthly meetings for those with full calls, whilst B.R.S. and A.A. members are trying to form a permanent club for the installation of gear and a library.

GW5KJ is convalescent after an operation and

will not be very active for awhile. 5TW and 5LV are chiefly interested in 28 Mc. 6JW has installed an NC101X and is active on 28 and 14 Mc. mainly C.W. 2WO and 2SN are especially interested in theoretical study. 2UL has received a complimentary copy of the D.A.S.D. journal "C.Q.," containing an article by Hans Rollberg about the Swansea group. 2UL completed his 'phone W.A.C. by working YV5AA and a six continent 'phone W.B.E. by a contact with VP3BG. 5PH is on 7 and 14 Mc. 6GJ is on 14 Mc., as is 6XC, who now has a junior op. Congrats, O.M. 5ZL has installed a new receiver; 8HI is active on 1.7, 7 and 14 Mc., and contemplates a complete rebuild.

We must congratulate GW5VX on receiving the King's Medal for Coronation Year. He has been on a month's sick leave, but is again active.

DISTRICT 11 (North Wales).

The meeting held at GW6AA on November 28 was attended by 12 members. The D.R. would particularly like to thank those who came long distances in order to be present. It was decided to hold regular meetings on the third Sunday in each month until April next, when they will be discontinued for the summer. The time and place of each meeting will be announced under the section entitled "Forthcoming Events."

Will members please send reports to the D.R. concerning any outstanding work? Particulars of any activity of general interest will be published in these notes. A list of active transmitting members, together with the bands on which they are working, will appear every two months. Present activity is as follows: 5FU, 7 and 56 Mc.; 2GV, 1.7, 7 and 14 Mc.; 6OK, 56 and 14 Mc.; 8HZ, 7 and 14 Mc.; 5TC and 5OD, 1.7 Mc.; 5YB, 56 Mc.; 6AA, 1.7 and 56 Mc.

Several members have expressed interest in slow morse transmissions and a station is wanted to commence a service in this district, preferably on 1.7 Mc.

DISTRICT 12 (London North and Hertford).

General interest and activity in the District continues unabated, 33 members being present at the November meeting to hear a talk given by Mr. D. N. Corfield (G5CD) on his new C.C. 56 Mc. transmitter. The actual apparatus was brought along for demonstration, and the meeting was a little late in starting, due to difficulty in obtaining permission to use the electricity supply. Unfortunately space does not permit a description of the rig, but a successful evening was enjoyed and much interest taken in the demonstration, the meeting concluding at a late hour.

Particulars of the December meeting will be found elsewhere in the BULLETIN and it is hoped that in spite of the nearness of the date to Christmas, the usual large gathering will be present.

Many members have reported active and it will be appreciated if, in future, particulars of contacts, etc., will be sent direct to G6WY for inclusion in "The Month on the Air." Normal activities should be reported to the District Scribe in the usual way.

G6LL is working break-in 'phone with W; 6QM has temporarily abandoned 'phone in favour of CW; 5UM has moved up to 14 Mc. as he finds 1.7 and 3.5 Mc. impracticable owing to local rag-chews; 8NV is working the States with 'phone on 7 Mc. and has finished his new transmitter for this band; G8JR and 2CWY are experimenting with 6L6 tri-tets, whilst 8QY favours 89's for CO and PA; 8KW has applied and 5FA has been granted permit for 25 watts: 8KW has A.A. for 28 and 56 Mc.

Congratulations to 2CHI, who is now G5NA, and can be heard on 7 and 14 Mc. He is using a Jones regenerated crystal oscillator circuit with satisfactory results. 8DR is also experimenting on the same lines.

G6ZO may be heard working on 28 and 56 Mc. G2GO, specialist in straight receivers, is at work on a new masterpiece.

Watford Area.—Seven members attended the November meeting held at Bushey. Discussion, as usual, was very varied, topics ranging from aerial design, volume expansion, and 5-metre conditions to very long-wave transmissions (17,000 metres and upwards).

G5RD reports a very powerful 5-metre signal on November 20, seeming to emanate from Hayes; no call was given. He is maintaining regular transmission periods from 22.00 G.M.T. on Monday, Wednesday and Friday. 6GR may also frequently be heard at these times.

G8MH has his 28 Mc. permit but is having a little trouble with a bad note on this band. Ex-ST2BN/VU2BN is welcomed to the area and hopes to have a G call soon.

Details of the December meeting will be found under "Forthcoming Events."

The D.R. and T.R.s take this opportunity of wishing all members a Happy Christmas and a Successful New Year.

DISTRICT 13 (London South)

We very much regret that no meetings have been held in South London this month, apart from the usual S.L.D.R.T.S. meeting. As previously mentioned, the D.R. has been confined to bed for some considerable time, and after a short holiday by the sea, he is now back at business, but unfortunately only one report has come to hand. This is very regrettable as the D.R. had hoped to receive the usual reports in spite of his absence from District affairs. The report received comes from G2GZ, T.R. for the New Cross Area. 5WG experimenting with microphones and speech amplifiers; 8GP working 'phone on 14 Mc.; 6CS using MO-PA and finds it very satisfactory; 2GZ using CW and 'phone on 28,188 kc. and 28,592 kc. Mr. Shersby wishes to appeal to those members in his area to endeavour to attend a meeting occasionally. He is very upset at the lack of support from the local amateurs.

For the cause mentioned above, no meetings have apparently been arranged for December, but it is hoped to get things shipshape in a few weeks' time.

DISTRICT 14 (Eastern)

East London.—The attendance at the November meeting held at G6AH, Seven Kings, was fair. BRS3044, of Harold Wood, attended his first meeting. 56 Mc. activity is again in evidence, and both old and new stations have been heard. Members at the meeting expressed sympathy with G2YW at the death of his mother. Those wishing to take part in the Morse classes should get in touch with BRS3104, 30, Marmion Avenue, South Chingford, and not at Hall Lane, as mentioned in

November notes. BRS3116, of Colchester, wishes to meet other members in and around that town.

East Essex.—The attendance at the November meeting held at G2MY, Prittlewell, was 19. After some discussion it was decided that G2LC should continue in office as T.R. for next year. It was with great regret that we learnt that Mr. Adams was leaving the district. He has very ably occupied the post of secretary of the Southend and District Radio Society for three years, and it was entirely through his efforts that the Society was affiliated to the R.S.G.B. He has been active as the operator of the S.R.S. transmitter (G5QK). We wish him success in his new employment and hope to hear and work him when he gets on the air again at Welwyn Garden City. The post of secretary has been taken over *pro tem.* by G6CT, to whom we offer best wishes.

It is proposed to fit the Southend lifeboat with a transmitter and receiver, as it is understood that the lack of a radio link with the pierhead has often caused the lifeboat a fruitless search, as no efficient means is available of recalling it. Suggestions and offers of help will be appreciated.

The usual stations report active or inactive, several still rebuilding. G8RT has completed a 1-V-1 T.R.F. 56 Mc. receiver and hopes to be on the air on that band very soon with C.C. rig. Others are constructing 56 Mc. gear and the T.R. is glad to see his remarks *re* 56 Mc. activity have not fallen upon barren ground.

The D.R. would like to take this opportunity of wishing all members in the District a Happy Christmas and a Prosperous New Year.

DISTRICT 15 (London West, Middlesex and Buckinghamshire).

The October meeting was not so well supported, due, no doubt, to the prevailing fogs, but we were pleased to have G8MH with us again. A number of subscriptions to the District magazine expire with this month's issue; if one is your's, please see to it that it is renewed right away.

Reports are better, but they still represent only a small percentage of the membership.

West London.—G6CO rebuilding; 8WR worked ten countries on 7 and 14 Mc. and installed a Sky Chief; 2CMG nil; 2CSD building transmitter; BRS3021 finds training for the Junior Skating Championship curtails radio; 3052 is building a superhet; 3074 sends splendid log of stations heard.

Middlesex.—G6LJ testing remote control equipment using the 56 Mc. band; 6VP contacted K7 four times, also VE5, but found VU has disappeared, while S. Africans have been prolific.

South Middlesex.—2CZG got receiver and transmitter working down to 56 Mc. Active: G2KI, 2LA, 2NN, 2VV, 2ZY, 6GB, 8IP, 8MB and 8MK.

Bucks.—G2RL rebuilding; 6JK rebuilt using 6L6; 8JK troubled with pre-amplifiers; 2AKZ experimenting with oscillators; 2BVX rebuilding to A.C.; 2BAO, a new member, has call sign owned by G6WN twelve years ago; BRS3020 nil to report.

A very successful annual general meeting of the T.V.A.R.T.S. was held during the month, when it was reported that the financial aspect of the society was very good and steady progress had been made all round. Twenty members enjoyed a visit to *Messrs. Gambrell Radio Communication Company's* works on November 21 and were ably conducted round by Mr. H. E. Stoakes.

Southall Radio Society are holding an interesting discussion, "The Future of Amateur Radio," on December 21. Several other talks and discussions have taken place during the month.

The D.R. wishes to thank the T.R.'s and all members who have assisted in any way towards the advancement of the District's activities during the past year and at the same time sends "Seasonal Greetings" to his many friends everywhere. The T.R.'s also wish to be associated with these greetings.

DISTRICT 16 (South Eastern)

Ashford.—All stations are active in one way or another, but have nothing particular to report. Our congratulations to BRS2626, who is now 2CJT.

Bromley.—Fourteen members were present at the meeting on November 20, when a debate took place on the relative merits of 'phone and C.W.; the latter was unanimously declared the better of the two. No individual reports have reached the T.R. this month. The next meeting will be held at *A.C.S. Radio* on December 18 at 8.15 p.m., and a discussion on wave propagation has been arranged.

Chichester.—The West Sussex Short Wave and Television Club had two interesting lectures on November 18 and 25 by Mr. A. Hollins, of *Mullard Wireless Service* on the Cathode Ray Tube. The lecturer dealt with theory and the application of the tube to television and oscillography, and followed with demonstrations. All present agreed that the lectures were most interesting, and Mr. Hollins was accorded a hearty vote of thanks.

Individual reports: G2PF on 14 Mc. with 6L6G tritet, link coupled to T55 with 100 watts, he is also on 56 Mc.; 8RO busy with directive aerials; 2ZV testing new Super Skyrider and likes it. 2CDR willing to stand by for any station on 56, 7 or 14 Mc. provided they will provide a sked under both day and night conditions. Congratulations to BRS2764 on his new call 2CIX, and to Mr. R. F. Hansford on acquiring the call 2BGH. 2CIX recently heard the A.P. television at S8 on the L.S. 2BBB (56) BRS3028 (14 and 28) and BRS2881 also report.

Eastbourne.—The Eastbourne Radio Society has again commenced activity after a lapse of two or three years. (When and where are your meetings, O.M.'s?—D.R.) G2AO is back again with a new transmitter which works good DX; he is also on 1.7 Mc., that deserted band which could do with a larger population. 5IH is on 1.7 and 3.5 Mc., 5BW on 7 and 14 Mc., and 8CP on 7 Mc. 'phone. 2BIU is rebuilding. We have pleasure in welcoming 2CGH and BRS3083 to the District.

Gravesend.—A lecture on and demonstrations of short-wave components and receivers was given by *Messrs. Lissens* at the meeting on November 1. Mr. E. Cholot, the lecturer, was heartily thanked for a very interesting evening. 2UJ gave an informal talk on "56 Mc." on November 15, during the course of which the new Kraus, or W8JK double-direction beam aerial was described, and results given of experiments with the G6GR/G2UJ special quiet quench receiver, together with other comments relative to transmitters and receivers for the U.H.F. It is hoped to arrange talks by the Post Office, and *Messrs. Mullards*,

in addition to those mentioned in the October issue of the BULLETIN.

Heathfield.—G5AQ is using grid-modulation on 14 Mc. but has had no DX as yet. 5PR now has mains and uses 59-RK23-T20. 5JZ has erected a 60 ft. mast, while 5PN is testing a Jones exciter with a 6L6G. 1173 has heard a television signal on about 4.75 metres (harmonic ?) and complains of G stations who use 14 Mc. for local rag-chews during contests.

Tunbridge Wells.—G5KV is erecting 132 ft. aerial and hopes to stage a come-back on the air, after an absence of about six months.

2UJ is busy rebuilding for a T20 output, and is active on 1.7 and 3.5 Mc.; he is also testing U.H.F. receivers and Pi aerial matching networks.

Haywards Heath.—Congratulations to BRS2594, who is now 2ARU.

DISTRICT 17 (Mid-East).

Boston.—G8BQ has a new rig in operation, but finds conditions poor on 14 Mc. 6LH and 6GH find little time for radio, but the latter has worked ZE on 28 Mc. and wants Asia for W.B.E. on that band.

Brigg.—G8AP is very pleased with his new Zepp aerial and has worked ZL, VK, K4, 7CX, KA, W5, VE5, ZE and FB8.

Horncastle.—2AAS is busy rebuilding and waiting the arrival of new gear.

Mablethorpe and Sutton.—G5BD is now WAC and WBE on 28 Mc. He has worked XE1CM and would like to know if this is the first XE-G contact on 28 Mc. 2FT is busy testing aerials. 5LL now in the Grimsby district is active at week-ends. 5CY is still getting plenty of DX on 28 Mc.

Cranwell.—G8FC is on 3.5 Mc. and the following report active, 8DY, 8PF, and 8PQ. 8GS and 8PI will be on the air shortly.

Grimsby Area.—G8PV is rebuilding. BRS3056 is now 2BXG. The following report active, 5GS, 2VY, 6AK, 8JN, 8HD, 6RN.

DISTRICT 19 (Northern).

Many members have been inquiring the reason for the non-appearance of our notes last month. The D.R. desires to state that none were received, but this month the response is much better.

Stockton and Darlington.—G2FO, who has paid a visit to 5QY, hopes to be on 28 Mc. in the near future and later on 56 Mc. C.W. 5XT is trying out T55's on 7 and 14 Mc. 8CL is busy on a rotary aerial system, after erecting his "tower" he says his QRA looks like an oilfield! 6ZT and 8GL are on 14 Mc. 8OH is finding his new W3EDP aerial a big improvement over his Zepp. Also active are 6DR, 8PS, 2CBA, 2BHU, 2CZO.

Newcastle.—The N.E.A.T.S. meetings are now being well attended after its reorganisation a few months ago. Each meeting is devoted to a pre-arranged technical discussion on informal lines. The annual subscription is now 5s. per annum, paid annually or half-yearly, and meetings are held on first Sunday in each month at G2LD's QRA. The D.R. would like to thank G2LD for his help in the matter of accommodation, and all members will join in this appreciation. 2CKG now G6UC, is active on 7 and 14 Mc. Congratulations, OM! G8SG is inactive after his burst of DX. 2CIC has passed his Morse test and awaits call. G2PN is active on 1.7, 14 and 28 Mc. and has finished his new six-band A.C. RX. He is getting ready for 56 Mc. C.W. 2XT is active on 1.7 and 28 Mc. C.W. and 'phone and is building an A.C. RX. 5QY has been on all bands except 3.5 Mc. and has completed 'phone WAC on 9 watts input by working two VK's on 28 Mc. 'phone. 6IR has worked DX on 28 Mc. 5RI has been on 1.7, 14 and 28 Mc. and has now WAC on 28 Mc. after a long wait for South America. 6YL continues the good work on 56 Mc. C.W. and is still running schedules with 5QY. She contemplates a new RX for 28 and 56 Mc. in the New Year.

No reports have been received from South Shields or Sunderland, although there is plenty of activity. G5WZ is now C.C. on 56 Mc. and putting out a fine signal. 8KK is working DX mostly ZL and VK. on 14 Mc. Also active are G6XO, 8VV, 8IF, 8JO, 6VG, 2BDQ, 2BGG and 2ARY.

The D.R. would conclude by asking more members to report their activities to him by the 26th of each month.

Scotland

The Empire Exhibition QSL cards have now been distributed and we hope that many of them are now on their way around the world to spread the tidings of the great Exhibition to be held in Glasgow next year.

"A" District.—The first of the new meetings was held on November 18, and while a fair number of members were present, the attendance was somewhat disappointing. No doubt, however, this was due to the rather short notice given. It is hoped that the next meeting will be well supported. A discussion on 56 Mc. work was given by Mr. F. H. Goldsmith, GM6VH.

The usual monthly meeting was, as always, well supported, and Mr. A. Q. Morton, 2CJH, gave a most interesting lecture on receiver design with special reference to some unorthodox circuits to which he has devoted much time and study. The lecture, which was arranged at exceedingly short notice, was much appreciated by the members. Mr. Morton has kindly offered to demonstrate a receiver incorporating the circuits on which he lectured.

Several stations, including GM8AH, 8MJ and 6ZV, are preparing to put C.C. transmitters into action on 56 Mc. Some noteworthy work is being done on 3.5 Mc. by 5ZX using a RK25 as ECO. With only 2 watts input, OH, SP, OK, HA and YT have been recently worked. 5ZX would like to see more activity on 3.5 Mc. amongst GM stations. Mr. S. S. Macilwain, 2ART, is GM2SL, and Mr. A. Graham, BRS2665, is 2DAB.

"B" District.—The most important news this month is the acquisition of a clubroom where meetings can be held at almost any time. Consequently meetings will now take place every fortnight, while Morse practice classes will be conducted every Sunday evening by GM5YN and GM6BM.

"C" District.—GM5NW has worked most zones on 14 Mc. 'phone and is also active on 3.5 Mc. 5SC and 8CF have now licences for 28 and 56 Mc. and are busy preparing for activity on those bands. Activity on 7 Mc. continues at GM8HM, while 2CLA is just about ready for Morse test.

"D" District.—Congratulations to Mr. T. W. Readshaw, GM6UU, who has been elected a Town Councillor of Bonnyrigg, having topped the poll

at the recent elections. No other news is to hand at time of writing.

"F" District.—A good attendance was present at the monthly meeting. GM6RV only requires W7 for all W districts on 28 Mc. phone. 8HP, 8JG and 8FT are all very active and working DX. 6XW is preparing for 56 Mc. 6NX works much DX on 28 Mc.

"G" District.—It is understood that GM6RG'S 56 Mc. signals have been heard in W, and hopes run high of a two-way contact.

"H" District.—The district is active, with enthusiasm running at a high pitch. GM6JJ, who is a recent arrival from "D" District, has just received his H.B.E. certificate. Meetings are being well supported and various features at them are much appreciated, in particular a series of lectures by Mr. Gouck, 2CWG. A party of members visited "D" District and much enjoyed the trip. It is hoped that a party from "D" District will visit "H" District in the near future. All the fully licensed members are active. GM8SQ is doing good work with QRP on 14 Mc., a tritet C.O. with 6 watts input being in use. 8MQ and 8KR are also very active.

Northern Ireland.

Gi8PA, who is "hum-hunting," changed his QRA 30 miles recently, and was "off the air" for only 20 hours. Gi5SQ is again active with 6L6 CO and TZO5/20 PA. Gi5SJ worked W7 with his new exciter unit. G2SB will soon have a Gi prefix. Gi5WD is again active on 28 Mc., and is contemplating a communications receiver. Gi6WG continues to work DX on 14 Mc. Mr. E. J. G. Tucker, 2AVQ, is now Gi5DX, and has our best wishes; all Gi's should be able to work DX now. His crystal frequencies are 7195 and 7185 kc.

Gi2CC, the Ballygally "Regional," sends a most appreciated descriptionette of his station. 015/400 CO drives an RK25 in doubler/buffer stage, and an RK20 acts as PA. Both CW and phone are used, the latter with suppressor grid modulation. Though many W contacts are made on phone the mountains make this direction difficult. A Collins network on Zepp feeders to a half-wave aerial 64 ft. high is found best. A young local recently climbed the 64 ft. mast and fitted a new halyard, so they are tough in the North too! Gi2CC will welcome visits from Gi's. Gi2CC is certainly doing fine work.

Gi8UW is rebuilding, but remaining active. Gi2SP has fallen for a communications receiver.

As can be seen from the above, the District has a considerable amount of activity at the moment. Another sign of activity is the frequent multi-way local phone QSO's on 14 Mc. in the Belfast district, as many as eight stations participating in the use of this band for local phone.

DISTRICT 15, Social Evening

District 15 are arranging to hold their second Annual Dinner, Dance and Whist Drive on January 29 at the Bush Hotel, Shepherds Bush Green. Tickets 5s. 6d. each, obtainable from the D.R., T.R.s and members of the Social Committee. *Ham Dress only*. Ladies will be cordially welcomed.

Egyptian Notes

Conditions on 14 Mc. have been much better during the past month, even if queer at times. Several fade-outs have been noticed, usually beginning about 18.00 G.M.T. During these periods, no European stations at all were audible and real DX signals were coming through faintly and with some echo. For most of the month QRN was particularly severe.

Of 28 Mc. the least said the better! Those few in SU who are interested in this band are so thoroughly disgusted with it that there is little wonder that it is almost completely ignored. About six W 'phone stations for the whole month constitutes the DX heard!

We are pleased to welcome back SU1RD from a business trip in Europe. No time has been wasted as he has started the construction of a new rig for 7 and 14 Mc. The line-up is a 6A6 crystal oscillator followed by an 804 P.A. It is intended to suppressor grid modulate this using MH4 and ACP1 triodes in the speech amplifier. This modulator is, however, only for temporary service as the 804 pentode will ultimately be plate and screen modulated by means of 46's in Class B. A special Thordarson transformer has been ordered.

It is also with great pleasure that we have to record the return of SU1RK, who has been off the air for about two years. The whole transmitter has been rebuilt to rack and panel type of construction with quite satisfactory results.

The changeable conditions have made themselves noticeable during the daily schedules between SU1SG and GW2UL, so much so that for several days no signals were heard at this end at the time fixed for the schedules. Apart from the above the only other item of interest from this station was a first SU QSO between VP3BG and SU1SG, this being on 'phone.

From SU2TW it is learned that the Class B gear ordered from G has been shipped and is expected daily. In the meantime, he has been busy spring-cleaning (late or early, O.M. ?), testing grid modulated 'phone, and, as usual, testing different kinds of aerials with the aid of a 0/300 RF Thermal milliameter. Our congratulations to him on his W.B.E. award which was announced in the last BULLETIN.

BERS387 has been winding a H.T. transformer for a 500-volt power supply and also rebuilding his receiver. The latter will use a SG detector valve and the usual audio stage. Smoother regeneration and an increase in sensitivity are the chief aims.

The past month has easily proved to be the best for DX as far as SU1WM is concerned, and the following are first QSO's between SU and the countries in question:—HH3L, OXVC, HO2U (QSL received from Aden), FR8VX, ZS3F, FI8AC, K7EVM, and VO6D. This last was the result of co-operation on the part of W2IXY, also the ill-health of SU1SG, at the time, for whom the schedule was arranged. Daily schedules with VU2FX are now being kept with interesting results.

SU1WM.

Stray

G5RF tells us that K6OJG, located at Agana, Guam, is looking for G contacts between 5 and 7 a.m., Guam time. His frequency is 14,300 Kc.

BRITISH EMPIRE NEWS AND NOTES

British West Indies (Eastern Group)

By VP2AT.

Conditions continued poor during the month and consequently activity was again very low. 28 Mc. showed some improvement, however, and 2AT had a QSO with ZU2J on the 23rd for the first VP2—ZU contact on that band. 2DA and 2AT have been active on 14 Mc. 'phone. 3PH is a newcomer in British Guiana; 3BG is active as usual on 14 Mc. 'phone. 4TH in Trinidad reports that the Government are now issuing licences and expects quite a lot of stations to be on the air there in a few weeks. The regulations call for one year on C.W. before being allowed 'phone.

In Barbados 6TR has at last obtained permission to operate on 14 Mc. and has been very active on this band during the month. 6YB has given 28 Mc. a try with very good results.

Canada (First District)

[Mr. C. B. Dowden, VE1HK, who recently took over as our representative in the Canadian 1st District, submits his first report.—Ed.]

Since Canadian amateurs are so near to the high-powered U.S.A. stations, we almost raise flags when a contact is made with an amateur in a distant part of the Empire! However, in spite of the QRM from the South, many Canadians continue to do good work. These include VE1EA, who, with a new transmitter and receiver, has worked U9, FY, K6, FR, etc., and VE1CR, who has contacted European and South American stations on 28 Mc. phone. He is looking for Asian and African stations on this band. VE1HK has also been on 28Mc., and has contacted Empire amateurs in all continents except Asia. He would gladly give his shirt to raise a VU or VS on 28 Mc.! Any offers, VS1AA, VU2AN, VS6AH, and the rest of you?

Members resident in VE1 are asked to report regularly to VE1HK at 49, Walnut Street, Halifax, N.S.

Ceylon

By VS7RP.

Conditions on the whole for October were not so good as the previous month. Afternoon and evening thunderstorms, especially during the last week of the month, caused severe QRN, especially on 7 Mc. As far as is known only two VS7 stations took part in the VK-ZL contests. 'Phone QRM at times spoilt quite a few possible contacts in these tests, and it is regrettable that Empire 'phone stations were amongst those who interfered. Surely they could occasionally give those who only operate on C.W. an evening to themselves.

VS7MB reports that during the VK-ZL tests he found conditions very bad for hours on end without any contacts, but when made the report received was S6 to 7. VS7RA found conditions up to October 25 quite good between the hours of 17.00 and 18.30 local time, but afterwards QRN increased. He has had good 'phone contacts with W, FB8, KA1, PK, ZS, and CE. He has had quite a lot of trouble with microphones. VS7GJ has also been putting over some good 'phone to Central America, and the islands in the Caribbean Sea. He desires it to be known that he has of late been inundated with listeners' reports, most of which were of no value, and he does not intend to answer any more unless an international coupon is sent. VS7RP took part in the VK-ZL tests and found conditions on 14 Mc. very similar to those reported by VS7MB. All VK zones except 8 and 9 were worked, and the only one missing from ZL was zone 4. With the exception of South America, all the other continents were worked during the month.

Channel Islands

By G8DO.

G8MF has recently purchased a 45′ mast and intends to erect a 56 Mc. vertical aerial for receiving purposes. He is willing to work in co-operation with any English station. His QRA is admirably suited for this work as he is situated on one of the highest points of the island with no screening whatsoever. At the moment he is putting out a very nice signal on 14 Mc. both C.W. and telephony. 2BTP is shortly moving to an A.C. district and for the next few weeks will be busily engaged in redesigning his transmitter to meet these new conditions. He is also taking an active interest in sound recording and is obtaining the necessary equipment for this very interesting study. 2AIX has just completed his first transmitter which will be powered by D.C. mains.

G8DO is attempting 14 Mc. telephony using Tritet P.A. plate modulated by a type 6A6. A rotary converter is in use and some trouble is being experienced in eliminating unwanted noise from this source.

Will Jersey members please let the writer have their notes by the 25th of each month. At the time of writing no reports are to hand from that island.

Irish Free State

By EI9D.

"Amateur Transmitter Design and Adjustment" was the title of a talk given by EI7F, Mr. H. V. Scott, before a meeting of I.R.T.S. at Jury's Hotel, Dublin, on November 26. Having returned from his sojourn on the Continent, EI6F is again active with C.W. and telephony on 7 and 14 Mc. GW8WD is the new call of Mr. R. McDonnell, ex EI7G, whose QRA is now Cardiff. We look forward to a contact and wish him the best of luck with the new station.

Malaya & Borneo

By VS1AA

VS1AF reports pleasant personal QSO with W6CLS. He has been busy constructing a valve voltmeter and 100 kc. oscillator besides rebuilding his exciter unit. At present he is working telephony.

VS1AL has been busy on Service work and this has curtailed his amateur activities. VS1AA is indulging in an orgy of rebuilding, but a little operating time is spent on 28 Mc. The receiver is now operating well on 56 Mc. but so far no signals, other than one telephony harmonic, have been heard.

Malta

By ZB1E.

The unsettled conditions on 14 Mc. which prevailed during October continue and have lately become even more erratic at times. Very short skip obtains during most of the day, improving slightly for short intervals in the early evening after which the highly erratic periods begin, about 18.00 G.M.T., with the skip rapidly getting longer and bringing in VK, ZL, LU, PY, VP4, VP8, W4, W5, for short intervals at R5 S4 against a very nice and silent background. Contacts rarely successful at this period last only for a few minutes. The band goes dead, around 20.30 G.M.T. The 28 Mc. band improved only slightly and, but for an occasional W, only locals are heard.

Both ZB1E and 1H are finding that local conditions of QRM favour the use of their 1-V-1 receivers for C.W. in preference to the SS superhet, which is being mainly used for telephony. ZB1J having moved the station to another room is experiencing some difficulty with his new aerial. ZB1O expects to be back on the air soon, and 1P is experimenting with three aerials. Ex-G6UR, is now ZB1R, and we wish him good luck. BERS403 awaits a new receiver and contemplates 56 Mc. tests with 1P. We welcome BERS416, a new member and cousin to 1L. ZB1O tells us that G5FW is now stationed in Malta and we hope to meet him at the next meeting.

The ZB1 group offer their best wishes to all fellow amateurs for a Happy Christmas and a prosperous New Year.

Mauritius

By VQ8AF

Both VQ8AA and 8AC are inactive, the former for rebuilding and the latter because of business. VQ8AB, using 6L6 in Tritet on 14288 kc. reports that conditions between Mauritius and the West Indies were exceptionally good on September 23, the day before equinox. He worked VP5PZ and VP1AA and obtained a report of RST569 from both with an input of only 12 watts. Other DX has been G, ST2, SV1, W1/9, D4, VE, ZL, J, F8, OZ.

Conditions for October were very erratic on 14 Mc, and VK hard to raise in the VK/ZL contest. VQ8AF had contacts with VK, G, W5, 6, 7, HB9, OK and FI8AC.

New Zealand

By ZL3AZ.

The best piece of news for the month has had the effect of making the writer seriously consider taking up quoits or shove-ha'penny or some other exhilarating sport. After seven years of trying, ZL3BJ has at last succeeded in contacting a South African, ZS5B. The method of working him is interesting. ZL3BJ used a single wire 40 meter aerial on 20 metres and fed this from a pair of 6L6 valves as doublers from 40 to 20. Shades of Sir Oliver Lodge and Marconi! What efficiency! After pondering about this for three days and thinking about the six and a half years, the writer has put in in futile calling of South African stations, he resolved to be up and going, so promptly snaffled a very rare one for ZL in YV5AK. The latter was worked on 14 Mc. and is only the second YV ever heard on any band. It may be mentioned that very friendly rivalry exists between ZL3BJ and the writer. Both stations are situated only a few hundred yards apart and DX work is usually carried out by mutually agreed upon periods for each station during the DX season.

From Auckland in the north comes the news that ZL1DV compounded a really respectable score in the recent VK-ZL Contest. His score ran into 70,000 odd points. Another good score was made by ZL1GX, while in the Junior section ZL1MR ran up an astounding figure for 25 watts input.

A consistent station on 14 Mc. is VQ8AS on Salomon Is., Chagos Islands, some 1,500 miles from Mauritius. He is heard here almost nightly on about 14,100 kc. The writer has managed two QSO's with him and several other ZL's have been heard in contact with him. VS7JW also puts a very good signal into New Zealand for an input of three watts. He is heard here generally around midnight.

News is scarce this month and the writer wishes that some ZL stations would send him a few notes occasionally in order that they can be sent on with this report. Will all New Zealand amateurs reading this please note?

South Africa

Division 1.—The P.M.G. has decided that all amateur call-signs beginning ZT or ZU will be replaced by those beginning with the prefix ZS. Call-signs already beginning ZS will remain unchanged.

In order to allow for existing stationery to become depleted the new calls will not come into effect until March, 1938. The ZT and ZU prefixes are, we believe, being used for commercial use only.

ZU6P's, whose new call is ZS6DW, will be operating 56 Mc., CW, and 'phone, between 15.30 and 16.00 G.M.T.; reports will be welcomed. He will be using his new call-sign.

ZS1AL had the misfortune to burn out his new super Skyrider after only having it a few days. He has received confirmation from the B.B.C. on his report of their 7½-metre speech transmission. He found he could only receive the transmissions on a 5-metre vertical aerial. Signals at times were R7. ZS1AN now possesses an NC100X. The following B.E.R.U. members are active: ZS1B, ZS1AH, ZS1AN and ZT1E. ZS1B.

Division 5.—The 7 Mc. band is still being troubled with QRN, but 14 Mc. has been much quieter and therefore more popular, DX being plentiful. 28 Mc. signals are coming in although no reports have been made as to contacts in Division 5.

There does not appear to have been much activity on 56 Mc. apart from the tests and observations which are being carried out by ZU5L, ZS5AK and ZU5Q. ZT5R has his rig very nearly completed.

The following members have also been active :— ZU5AC, ZS5U, 5Z, ZT5V, ZU5D and ZU5AF.

Reports on activities for inclusion in these notes should be sent to 45, Sentinel Avenue, Greenwood Park, Durban. ZU5Q.

Division 6.—All amateur radio operators in the Union may be organised into an auxiliary or reserve section to the South African Corps of Signals, under a scheme of the Defence Department. This section will be placed on a purely voluntary basis, and it is probable that shortly all amateurs interested will be invited to collaborate with the Signallers' Brigade chiefs in Pretoria, with a view to their services being ultimately enlisted. The intention, it is understood, is not to mobilise the amateurs into a military unit but to have available their experience should the defence of the country ever require it.

Monthly meetings of the African Radio Research Union will, in future, be held in the Students' Lecture Room, Public Library Buildings, Market Street, Johannesburg.

ZT6X has been successful in maintaining nightly contacts with ZL4DQ. His 'phone reports average S6/7. He has been instrumental in placing a few local stations into contact with ZL4DQ.

ZU6C and ZS6T are active on 28 Mc., and have made a number of 'phone contacts with W stations. Both would appreciate contacting Canadians.

ZT6AQ, ZS6Q, ZU6AD and ZU6N are on 14 Mc. New additions to ZT6AD's log are : U4, W2, K6, KA1, ON4, VK5. He is using a 59 tritet oscillator doubling to 14,364 kc., and a half-wave Zepp aerial.

ZS6C and ZS6AM have moved from Ulberton, and are resident in Eureka, Barberton District. They are accompanied by ZU6AA. ZS6M has returned to Johannesburg and is on 14 Mc. ZT6M has moved to Florida, on the West Rand, and contemplates rebuilding for 28 Mc. ZT6AC has been heard working W stations on 14 Mc. ZU6V is building an additional stage for his 14 Mc. transmitter, and associated power supply. KA1 has been contacted on 14 Mc.

Reports please to Box 4020, Johannesburg. We wish all our friends a Merry Christmas and Happy New Year. ZU6V.

QSL Cards

A method of displaying QSL cards, which may, or may not be original, is to stretch out a section of ordinary lattice fencing and suspend it at two or three points, either on hooks or from a picture rail. The cards can then be attached by means of drawing pins in the usual way, without damaging the walls. G2NN.

The Helping Hand

The popular Helping Hand feature is unavoidably held over this month, but publication will recommence in our next issue.

G3 Calls

Call signs in the series G 3 were first issued during the later part of November.

S.A.R.R.L. International DX Contest 1938

AMATEURS throughout the world are invited to participate in the second South African Radio Relay League International DX Contest to be held over the second and third week-ends of January, 1938.

The success of the "Johannesburg Jubilee" contest held in January, 1937, was so encouraging that the League has decided to make this contest an annual event. Through the generosity of Mr. G. Ross Kent, ZT6R, the League is pleased to announce that a handsome trophy will be awarded to the winner in the Union of South Africa, provided he is a full member of the League in good standing at the commencement of the contest.

Handsome certificates will be awarded to the winners in each of the African zones, viz.: ZS1-6; ZT1-6; ZU1-6; CR6; CR7; VQ2; VQ3; VQ8; ZE1; ZN1 (Bechuanaland); ON4 (Congo); FR8 and FB8 (28 zones).

As an incentive to operators in the following countries, U.S.A., Australia, New Zealand, Canada and Argentina, these countries have been sub-divided into their respective divisions (or licensing areas), and the winner in each of these sub-divisions will receive one of the League's certificates.

The winner in all other countries will also receive a certificate.

Conditions.

(1) The Contest will run from 0200 G.M.T., January 8th, 1938, to 2200 G.M.T., January 9th, 1938, and will be continued at similar times on the following week-end, January 15th to 16th.

(2) An RST report followed by a selected serial number (to be used throughout the period of the contest) must be exchanged between stations.

(3) Two (2) points to be claimed for "two-way" exchange, and one (1) point for "one-way" exchange.

(4) DX stations outside the South African zone will multiply points gained by the number of S. African zones worked.

(5) "South African" stations will multiply points gained by total number of countries (or sub-divisions) worked.

(6) Contacts with ships at sea or in port, will not be considered.

(7) All bands may be used but only 1 contact per station per band is permitted on any week-end.

(8) All stations worked during the first week-end may be contacted on the second week-end.

(9) All stations to call "CQ SA test" (or "Test S.A." Ed.).

(10) The contest is open to all licensed amateurs throughout the world, and contest logs should be in the hands of the Contest Committee not later than March 31st, 1938.

Example of Contest Log

Date	Station	Time	Freq.	Zone.	Number Sent	Number Received	Points	Total

Total ____ multiplied by ____ = Grand Total

Declaration

I hereby certify that I have operated my station strictly within the rules and regulations governing amateur radio in my country, and agree that the decision of the President, S.A.R.R.L. shall be final.

Signed.....

M.A.T.S. Annual Dinner

The Medway Amateur Transmitters' Society held their fifth annual dinner at the "Sun Hotel," Chatham, on Wednesday, November 24. There was an excellent gathering of the amateur fraternity, with Mr. Clarricoats, G6CL, and Mr. Page, G6PA, representing the R.S.G.B.

At the conclusion of the dinner, Mr. Moss, representing *The New Observer*, presented the "Observer Trophy" to Mr. Box, G6BQ, and congratulated him on his fine score in the recent M.A.T.S. contest. He went on to say *The New Observer* was keenly interested in the work of the radio amateur, and they would always be pleased to give publicity to it.

Mr. Clarricoats, in presenting the Howlett 56 Mc. Transmitting Trophy to Mr. Nutton, G6NU (President, M.A.T.S.), and the Howlett 56 Mc. Receiving Trophy to Mr. Burbridge, congratulated the winners on their successes, and Mr. Howlett, 2AFT, on the very fine craftsmanship he had put into the trophies. He said, "The 56 Mc. band will undoubtedly be the band on which most interest will be centred during the next twelve months, and I am glad to see that the M.A.T.S. has taken a lead in this direction."

In presenting the "Moffatt Trophy" to Mr. Burrin for reception work in connection with the Observer Contest, the speaker said, "I am pleased to know that we have near London a newspaper that will print accurate reports regarding amateur activities, and one which does so much to help forward our work."

Other speakers were Mr. Nutton (G6NU), Mr.

Howell (G5FN), Mr. Ingleton (G5IL), and Mr. Burrin. Amateurs present included G6NU, G2CS, G5FN, G6QC, G2CM, G6TQ, G5IL, G8GR, G8BJ, G8SS, G5OX, G8TN, G2VB, and G2YW, in addition to several ladies and non-radiating and receiving members. G5FN.

Empire Calls Heard

*BERS*195, *Telegraph Station, Darwin, North Australia. October*, 1937 :—

7 *Mc.* (*C.W.*).—Vr1am (56), vu7fy (56), zl1br (57), 1jf (56), 3bj (56), 3gu (58), 3id (54), 3jd (56), 4fw (56), zs1ba (58), 1bd (55), 1l (33), 2e (55), 2g (55), 2x (55), 4a (55), 4q (55), 5ag (56), 5an (44), 5aq (55), 6am (56), 6bb (54), 6bc (55), zu1z (44), 2m (44), 5ac (55), 5aq (56), 6am (56), 6ar (35), 6p (56), 6u (44), zt1a (44), 2u (44), 2q (56), 5f (55).

14 *Mc.* (*Contest Period*).—G2ma (54), 5vu (54), 6xl (55), 6wy (44), gm6nx (56), ve4ro (56), vq3far (55), 8af (55), 8as (35), vr4oc (56), vs2ae (58), 6ag (56) 7mb (55), vu7fy (55), ze1ji (57), zs2x (55), 5u (57), zu6c (57).

14 *Mc.* (*Phone*).—Vs2ak (56), vu2bg (56), xz2dy (57), ze1jr (56), zu6p (57).

14 *Mc.* (*C.W.*).—G2nn (54), 2xn (56), 2yl (56), 6dl (54), 6rh (55), 8aw (55), 8fz (54), 8ip (33), gm2jf (55), ve3fb (55), 3qh (55), vq4ktc (55), 8as (56), vs6az (56), 7jw (56), vu2ae (54), 2dr (56), yi2ba (55), ze1jg (56), 1ji (56), 1jz (55), zl1ft (56), 1hy (58), 2gn (54), 2iw (54), 2ky (55), 4dq (55), zs1z (55), 2p (56), 6w (54), 6s (55), zt2z (55), zu2j (55), 5aq (56), 6ac (56), 6af (55), 6m (54), 6v (55).

The G2WD Dual Channel Equipment

It may interest readers to know that this equipment, which was described in the July, August, and September issues of the BULLETIN, and displayed at Olympia, has recently been put through exhaustive tests on the air.

Contacts have been made as follows :

On 14 Mc. : ZL, VK, PY, LU, VE3, 4, SU, ZU, W, etc., with an average report of 569x.

On 28 Mc. : SV, OH, SM, W 1 to 9, VK, PY, ZE, VE3, and 4, etc., with an average report of 579x.

During these tests the final stage has been run at 125 watts input, using a double Windom, ½ wave for 14 Mc., and full wave for 28 Mc. The two feeders terminate in (*a*) a 4-turn coil wound round the P.A. tank for 14 Mc., and (*b*) a 2-turn coil round the P.A. tank for 28 Mc. The aerial, judging by the stations worked, is as nearly as possible omni-directional, its orientation being 10° E. of N. to 10° W. of S. The height above ground is 50 feet at each end, 15 inches of spacing being used between the two halves of the top. G2WD.

50 WATTS C.C. TRANSMITTER—(*Continued from page* 301.)

suitable in all ways for the position, the writer approached *Messrs. Stratton & Co.* (Eddystone), pointing out that a low capacity split-stator condenser, of a type not ordinarily available, was required, and would fill a need felt by many amateurs, especially those working on the ultra-high frequencies.

As a result he is very pleased to announce that a special Eddystone condenser, Catalogue No. 1087, is in course of production. It is made of hard brass, with Frequentite insulation ; the vanes are well spaced, and breakdown will not occur with up to 1,500 volts ; the fixed vanes are cut away so that a large clearance is obtained at minimum setting, resulting in a very low minimum capacity (only 1 $\mu\mu$F). The maximum capacity (overall) is of the order of 12.5 $\mu\mu$F. The variation so obtainable is just right for modern high efficiency valves with anode circuits employing high L/C ratios.

The condenser is of very robust construction, and the physical size is reasonably small. At the price of 15s., at which *Messrs. Stratton* expect to offer it, the condenser represents really good value, and can be confidently recommended, not only for use in this particular transmitter, but also in any similar one, used on 14, 28 or 56 Mc., with an input not exceeding 150 watts.

MONTH ON THE AIR—(*Continued from page* 311.)

he has worked 38 Zones with QRP and is missing on UO and AC4. ZL2OU was worked with one watt input.

G5SO is shortly leaving the country for "an island off Arabia." He has not made up his mind about the call to be used, but assures us the signal will be a good one. A directional aerial will be used for working G on 14 Mc. phone. G6RH heard ZN2C (Bechuanaland), OX2ZA, EL2M, and says that CN1CR is on 14,410 most evenings. A card received from HO2U stated he was in Aden. G2ZQ heard K7GIE, K6OVN in Guam, HH3L, and HO2U when at Suez, Arabia. G5KG worked FI8AC for a new country, and asks if this is rare. Well, he is the only one active there at present ! G6CY is another to report HO2U. OXVC is still active and hopes to be on for the rest of the year, but has cut down his operation owing to QRM from Government stations. GM6HZ remarks on the rarity of W5 and W7's on 14 Mc. during past few weeks. Try 28 Mc. In common with others, he notes that Africa has been the best continent during the bad condition in November.

G8CV reports that W6BOY (portable) is on a ship, the s.s. *Barbana*, and was heard off the coast of Nova Scotia. He has worked HS1BJ, J5CC, CX1BG, CE3AR, K6BBT, amongst a long list of fine DX. BRS770, of Bolton, heard XU8AZ 14400, and BRS2965 of Dover heard PY1FR, PY2FF, LU1AY, CE1AR, VU2BG, HI2K on 14 Mc. phone. G6FU heard ZK1AA in 1936 and received no answer to QSL. G6WY has worked VO6D (phone) and VE5ACS both in Zone 2, also CR7AY, and FB8AA, who is old FB8AG. BRS2917, of Belvedere, Kent, reports the following 14 Mc. phones : FB8AF, ZB1E, ZB1H, ZS3F, ZU6M, ZU6P, VQ4CRE, CE3CO, YV5AA, VO6D, KA1BH, and others.

Tail Piece.—GM5YG worked I7EY in Harrar, Ethiopia, on 14025 C.C. on November 28. QSL *via* A.R.I.

"TWELVE YEARS BACK"—(*Continued from page* 314.)

" If they don't hear that they're crazy." Finally, he gets someone, loses his call-sign, calls again twenty times, finds he has picked up the wrong station. Finally scribbles in the log, " CQ " and " bum night." Goes to bed murmuring : " Fine thing to keep a log." Guess that bird's still alive, and he has a pretty large family by now.

EXCHANGE & MART

(Continued from Back Cover)

SURPLUS SALE.—RFP60, 39s., ; RFP15, 19s. ; unused, guaranteed. Moving Coil Mike, with Floor Stand, £2 ; 1,000 Voltmeter, 10s. ; 1,000 Transformer, 23s. ; ES755 Valve, 10s. ; PX25, 9s. ; 500-volt Transformer, 10s. ; three 7 Mc. Crystals, 8s. 6d. each.—ANDREW, Fore Street, Wellington, Somerset.

T6ID.—Good, 30s. ; T205/20, 15s. ; T25D, 15s. ; 2 RFP, 15's 15s. each ; DO25, 10s. ; 2 APP4C, new, 5s. 6d. each.—G2PF, 6, Alexandra Road, Chichester.

TOBE AMATEUR BANDS RECEIVER, metal cabinet, factory built and in good condition, with Wright DeCoster Speaker in crackle cabinet to match ; 10 months old ; cost £20, accept £10 ; B.T.H. R.K. Output 20-1, 2s. 6d. ; two 50 v. ½ h.p. D.C. Motors in good order ; Field Rectifier, heavy duty cinema type for two H.V. fields, Westinghouse Rectifiers, in metal case.—Offers, 2AAS, Horncastle, Lincs.

WHAT OFFERS ? Hammarlund Comet Pro, Crystal Filter ; perfect condition.—Write Box 2, " PARRS," 121, Kingsway, W.C.2.

SKY CHALLENGER, Xtal Gate Model, with Miller Preselector. Two months old. £21. Owner has RME.—Box 4, " PARRS," 121, Kingsway, W.C.2.

RK.28 complete with Holder, used one hour only. What offers ? or would consider part exchange for good Communication Receiver.—Box 5, " PARRS," 121, Kingsway, W.C.2.

LIFE ASSURANCE and all classes of Insurance effected. Advice given.—G6BJ, 18, Wales Avenue, Carshalton, Surrey.

TROLITUL.—Sheet, Former, Rod, etc., delivery from stock. Send for details of this u.h.f. insulating material. Better than ceramic, yet can be worked as easily as ebonite.—" DENCO," 59, Burrs Road, Clacton, Essex.

QSL's.—250, 4s. 6d., post-free ; samples gratis ; satisfaction guaranteed. G Log Books, 2s. 3d. —ATKINSON BROS., Printers, Elland.

Patents and Trade Marks.

GEE & CO. (Established 1905). Patents and Trade Marks throughout the world.—H. T. P. GEE, Mem. R.S.G.B., A.M.I.R.E., etc., 51-52, Chancery Lane, London, W.C.2. (Two doors from Government Patent Office). 'Phone : Holborn 4547 (2 lines). Handbook free.

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